# Aleutians East Borough
# Assembly Meeting

**Workshop: NO WORKSHOP**

**Meeting: Friday, October 16, 2026– 11:00 a.m.**

# ROLL CALL & ESTABLISHMENT OF QUORUM

# ADOPTION OF AGENDA

Agenda
Assembly Meeting
*(packet available on website [www.aleutianseast.org](http://www.aleutianseast.org) )*

Date: Friday, October 16, 2026
Time: Meeting: 11:00 a.m.

Location: By teleconference in each designated community location below:

| | |
|---|---|
| King Cove AEB office | Akutan -city office |
| Nelson Lagoon Corp. | Cold Bay City Office/ library |
| False Pass-city office | Anchorage office – 3380 C St. |
| Sand Point AEB office | |

All communities will be provided with conference calling information for the designated location in your community. Public comments on agenda items will take place after the adoption of the agenda. The meeting will also be broadcast on KSDP Public Radio.

SPECIAL ASSEMBLY MEETING AGENDA

1. Roll Call & Establishment of Quorum

2. Adoption of the Agenda

3. Public Comments on Agenda Items

4. Certification of the October 6, 2026 Regular Election Results

5. Swearing in Newly Elected Official

   - Mayor Alvin D. Osterback
   - Assembly Member Harlen E. Newman
   - Assembly Member Josephine Shangin

6. Resolutions
   - Resolution 27-27 adopting the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update
   - Resolution 27-28 Authorizing the Mayor to negotiate and execute an agreement with LONG Building Technologies for the Sand Point Boiler and Miscellaneous Mechanical Services, Maintenance, and Repair in an amount not to exceed $350,375

7. Next Meeting Date

8. Adjournment

# COMMUNITY ROLL CALL & PUBLIC COMMENT ON AGENDA ITEMS

# CONFLICT OF INTEREST

# CERTIFICATION OF OCTOBER 6, 2026 REGULAR ELECTION RESULTS

AKUTAN • COLD BAY • NELSON LAGOON
ALEUTIANS EAST
BOROUGH
FALSE PASS • KING COVE • SAND POINT

To: Mayor Osterback and Assembly
From: Beverly Ann Rosete, Clerk
Date: October 14, 2026
Re: Certification of the October 6, 2026 Regular Election

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Everything went well during the election. The Canvass Committee met after the election materials arrived to review the election materials and count the Absentee, By Mail, Special Needs, and Question Ballots. There were 19 absentee ballots by email and in-person ballots, 3 question ballots, 1 special needs ballot, and 28 by-mail-only ballots. The 3 question ballots were not counted.

The results of the October 6, 2026 Regular Election are below:

**AEB Mayor:**
Alvin D. Osterback

**Assembly Seats:**
**Seat A** – Harlen E. Newman
**Seat F** – Josephine Shangin

**School Board Seats:**
**Seat C**– Hillary Smith
**Seat D** – Melanie Hoblet

The following are the 2026 Regular Election Results, Canvass Committee Report, and Voting Percentages by community. Once the election is certified, terms of office begin for those elected on the first Monday following the certification.

# October 6, 2026 Regular Election Results

## FINAL RESULTS

### ALEUTIANS EAST BOROUGH MAYOR

| | |
|---|---|
| ALVIN OSTERBACK | **206** |
| PAUL GRONHOLDT | 112 |
| WRITE INS/BLANK | 17 |

### ALEUTIANS EAST BOROUGH ASSEMBLY

#### SEAT A

| | |
|---|---|
| HARLEN E. NEWMAN | **159** |
| TOM C. HOBLET | 119 |
| WARREN E. WILSON | 38 |
| WRITE INS/BLANK | 19 |

#### SEAT F

| | |
|---|---|
| JOSEPHINE SHANGIN | **299** |
| WRITE INS/BLANK | 36 |

### ALEUTIANS EAST BOROUGH SCHOOL BOARD

#### SEAT C

| | |
|---|---|
| HILLARY SMITH | **185** |
| LYNN FARR | 106 |
| WRITE INS/BLANK | 19 |

#### SEAT D

| | |
|---|---|
| MELANIE HOBLET | **172** |
| CARLA CHEBETNOY | 74 |
| ALAN ALDRED | 72 |
| WRITE INS/BLANK | 7 |

Beverly Rosete

Borough Clerk

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## CANVASS COMMITTEE REPORTS

## ALEUTIANS EAST BOROUGH
## REGULAR ELECTION

## OCTOBER 6, 2026

The Canvass Committee of the Aleutians East Borough, appointed by the Borough Assembly, met at 3:00 p.m. on October 13, 2026, for the purpose of canvassing the October 6, 2026 Regular Election. The following are the results of the canvass:

287 Ballots cast on Election Day.

48 Early Voting and Absentee ballots counted (includes by-mail communities and Special Needs).

0 Questioned ballots

335 TOTAL BALLOTS COUNTED.

3 Questioned ballots and by-mail ballots rejected.

THE CANDIDATES AND NUMBER OF VOTES THEY RECEIVED IS ATTACHED TO THIS REPORT.

The Canvass Committee reviewed ballots and other material from each community and present to the Aleutians East Borough the above as true and accurate.

CANVASS COMMITTEE:

Keomi Chrim

Marcy De Costa

Amy Mack

ALEUTIANS EAST BOROUGH
October 6, 2026 REGULAR ELECTION
**VOTING PERCENTAGES**

**AKUTAN** (includes 2 absentee ballots)
386 REGISTERED VOTERS, 78 ballots = 20%

**COLD BAY**
49 REGISTERED VOTERS, 10 ballots = 18%

**FALSE PASS**
30 REGISTERED VOTERS, 10 ballots = 33%

**KING COVE** (includes 4 absentee ballots)
300 REGISTERED VOTERS, 67 ballots =22%

**NELSON LAGOON**
34 REGISTERED VOTERS, 6 ballots = 18%

**SAND POINT** (includes 15 absentee ballots and 1 special need
410 REGISTERED VOTERS, 164 ballots = 40%

**ALEUTIANS EAST BOROUGH VOTING PERCENTAGE**
1,209 REGISTERED VOTERS, 335 BALLOTS = 28 %

0 Question ballots counted
3 Question ballots NOT counted
0 absentee ballot by-mail not counted because incomplete voter certification/postmarked after Oct.6, 2026

# SWEARING IN NEWLY ELECTED OFFICIALS

# OATH OF OFFICE

## ALEUTIANS EAST BOROUGH ASSEMBLY

I,_____, do solemnly swear that I will support the Constitution of the United States and State of Alaska and the laws and ordinances of the Aleutians East Borough, State of Alaska, and that I will honestly, faithfully and impartially perform the duties of Assembly member. So help me God.

_____
Signature

_____
Date

ATTEST:

_____
Clerk

_____
Date

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KING COVE OFFICE • P.O. Box 49 • King Cove, AK 99612 • (907)497-2588 • Fax: (907)497-2386
SAND POINT OFFICE • P.O. Box 349 • Sand Point, AK 99661 • (907)383-2699 • Fax: (907)383-3496

# RESOLUTIONS

Agenda Statement

Date: October 8, 2026
To: Mayor Osterback and Assembly
From: Glennora Dushkin, Executive Assistant
Anne Bailey, Borough Administrator

**Re: Resolution 27-27 Adopting the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update**

Aleutian Pribilof Islands Association (APIA) was a sub-awardee of the Alaska Native Tribal Health Consortium's NOAA Community Regional Resilience Challenge project to work on emergency response and resilience planning in the region and partnered with the Aleutians East Borough (Borough) to update the 2021 Aleutians East Borough Hazard Mitigation Plan (HMP).

This plan will assist the Borough, and the communities and tribes of Akutan, Cold Bay, False Pass, King Cove, Nelson Lagoon, and Sand Point as a valuable resource tool in making decisions.

The benefit of having a FEMA-approved and community-adopted HMP Plan is that it helps maintain eligibility for FEMA Hazard Mitigation Assistance programs, including the Hazard Mitigation Grant Program. An approved mitigation plan must be maintained and updated every five years to preserve eligibility for applicable FEMA assistance programs. Fairweather Science, LLC was contracted to prepare the 2027 HMP Update.

The latest draft plan is attached for the Assembly's reference. Per Resolution 27-27, the Borough Assembly would adopt the HMP as an official plan. Once all 14 jurisdictions adopt the plan, it will be sent to State and Federal agencies for final review and official approval. If changes are suggested by FEMA, the Assembly will not need to re-adopt the plan and will receive a memo stating what changes were made.

Jurisdictions included in this plan update are: the Aleutians East Borough, City of Akutan, City of Cold Bay, City of False Pass, City of King Cove, City of Sand Point, Native Village of Nelson Lagoon, Native Village of Akutan, Native Village of False Pass, Agdaagux Tribe of King Cove, Native Village of Belkofski, Qagan Tayagungin Tribe of Sand Point, Pauloff Harbor Tribe, and the Native Village of Unga.

RECOMMENDATION

Administration recommends the approval of Resolution 27-27, Adopting the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update.

**RESOLUTION 27-27**

**A RESOLUTION OF THE ALEUTIANS EAST BOROUGH ASSEMBLY ADOPTING THE 2027 ALEUTIANS EAST BOROUGH MULTI-JURISICTIONAL HAZARD MITIGATION PLAN UPDATE**

**WHEREAS,** the communities and tribes of the Aleutians East Borough (Borough) include the City of Akutan, City of Cold Bay, City of False Pass, City of King Cove, City of Sand Point, Native Village of Nelson Lagoon, Native Village of Akutan, Native Village of False Pass, Agdaagux Tribe of King Cove, Native Village of Belkofski, Qagan Tayagungin Tribe of Sand Point, Pauloff Harbor Tribe, and the Native Village of Unga; and

**WHEREAS,** the Borough and the communities and tribes of the Borough recognize the threat that natural hazards pose to people and property within the region; and

**WHEREAS,** the Borough has prepared a hazard mitigation plan update, known as the *2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update* in accordance with federal laws, including the Rober T. Stafford Disaster Relief and Emergency Assistance Act.

**WHEREAS,** the hazard mitigation plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the region from the impacts of future hazards and disasters; and

**WHEREAS,** adoption by the Borough Assembly demonstrates its commitment to hazard mitigation and achieving the goals outlined in the hazard mitigation plan update.

**NOW THERE BE IT RESOLVED,** the Aleutians East Borough Assembly adopts the *2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update.* While content related to the Borough may require revisions to meet the plan approval requirements, changes occurring after adoption will not be required by the Borough to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

**PASSED AND APPROVED** by the Aleutians East Borough Assembly on this 16th day of October 2026.

_____ ATTEST: _____

Alvin D. Osterback, Mayor Beverly Rosete, Clerk

# 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update

Including: Aleutians East Borough, City of Akutan, Native Village of Akutan, City of Cold Bay, City of False Pass, Native Village of False Pass, City of King Cove, Agdaagux Tribe of King Cove, Native Village of Belkofski, City of Sand Point, Qagan Tayagungin Tribe of Sand Point, Pauloff Harbor Tribe, Native Village of Unga, and the Native Village of Nelson Lagoon



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APIA
ALEUTIAN PRIBILOF ISLANDS ASSOCIATION

FAIRWEATHER SCIENCE







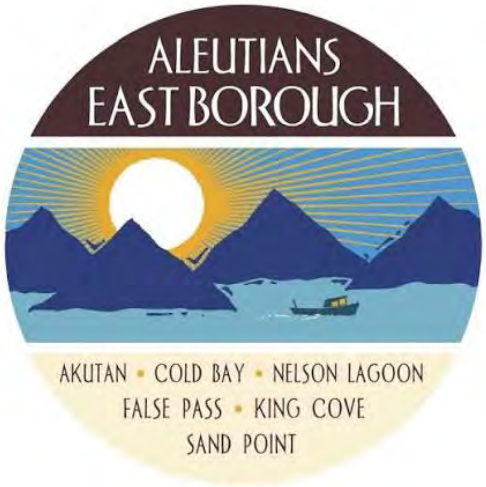































***This Hazard Mitigation Plan was prepared by Fairweather Science, LLC under contract to the Aleutian Pribilof Islands Association (APIA), subaward to the Alaska Native Tribal Health Consortium (ANTHC) using Federal funds under award NA24NOSX473C0101 from the National Oceanic & Atmospheric Administration, U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the National Oceanic & Atmospheric Administration or the U.S. Department of Commerce.***

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## Acronyms and Abbreviations

| | |
|---|---|
| ACCAP | Alaska Center for Climate Assessment & Policy |
| ACRC | Alaska Climate Research Center |
| AEC | Alaska Earthquake Center |
| AFPC | Alaska Food Policy Council |
| AICC | Alaska Interagency Coordination Center |
| AKEPIC | Alaska Exotic Plant Information Clearinghouse |
| AEB | Aleutians East Borough |
| ANTHC | Alaska Native Tribal Health Consortium |
| ANVSA | Alaska Native Village Statistical Area |
| APIA | Aleutian Pribilof Islands Association |
| ASDSO | Association of State Dam Safety Officials |
| AVO | Alaska Volcano Observatory |
| BIA | Bureau of Indian Affairs |
| BLM | Bureau of Land Management |
| CDP | Census-Designated Place |
| CFR | Code of Federal Regulations |
| DCCED | Alaska Department of Commerce, Community, and Economic Development |
| DCRA | Division of Community and Regional Affairs |
| DEC | Alaska Department of Environmental Conservation |
| DGGS | Division of Geological & Geophysical Surveys |
| DHSS | Alaska Department of Health and Social Services |
| DHS&EM | Alaska Department of Homeland Security and Emergency Management |
| DMLW | Division of Mining, Land, and Water |
| DNR | Alaska Department of Natural Resources |
| DSPR | Division of Spill Prevention and Response |
| EAP | Emergency Action Plan |
| EPA | U.S. Environmental Protection Agency |
| FEMA | Federal Emergency Management Agency |
| FERC | Federal Energy Regulatory Commission |
| GIS | Geographic Information System |
| GPS | Global Positioning System |
| HHPD | High Hazard Potential Dam |
| HMP | Hazard Mitigation Plan |
| HUD | U.S. Department of Housing and Urban Development |
| IK | Indigenous Knowledge |
| IPCC | Intergovernmental Panel on Climate Change |
| LHMP | Local Hazard Mitigation Plan |
| MAP | Mitigation Action Plan |
| MJHMP | Multi-Jurisdictional Hazard Mitigation Plan |
| MMI | Modified Mercalli Intensity |
| NAHASDA | Native American Housing Assistance and Self-Determination Act |
| NCEI | National Centers for Environmental Information |
| NID | National Inventory of Dams |
| NOAA | National Oceanic and Atmospheric Administration |
| NPS | National Park Service |
| NSF | National Science Foundation |
| NTWC | National Tsunami Warning Center |
| NWS | National Weather Service |
| PGA | Peak Ground Acceleration |
| PRT | Plan Review Tool |
| RCP | Representative Concentration Pathway |
| SHMP | State Hazard Mitigation Plan |
| SNAP | Scenarios Network for Alaska and Arctic Planning |

| | |
|---|---|
| STAPLEE+C | Social, Technical, Administrative, Political, Legal, Economic, Environmental, and Cultural |
| UAA | University of Alaska Anchorage |
| UAF | University of Alaska Fairbanks |
| USACE | U.S. Army Corps of Engineers |
| USCG | U.S. Coast Guard |
| USDA | U.S. Department of Agriculture |
| USDM | U.S. Drought Monitor |
| USFWS | U.S. Fish and Wildlife Service |
| USGCRP | U.S. Global Change Research Program |
| USGS | U.S. Geological Survey |
| WRCC | Western Regional Climate Center |

# FEMA Approval Letter

# MJHMP Update Summary (2021 → 2027)

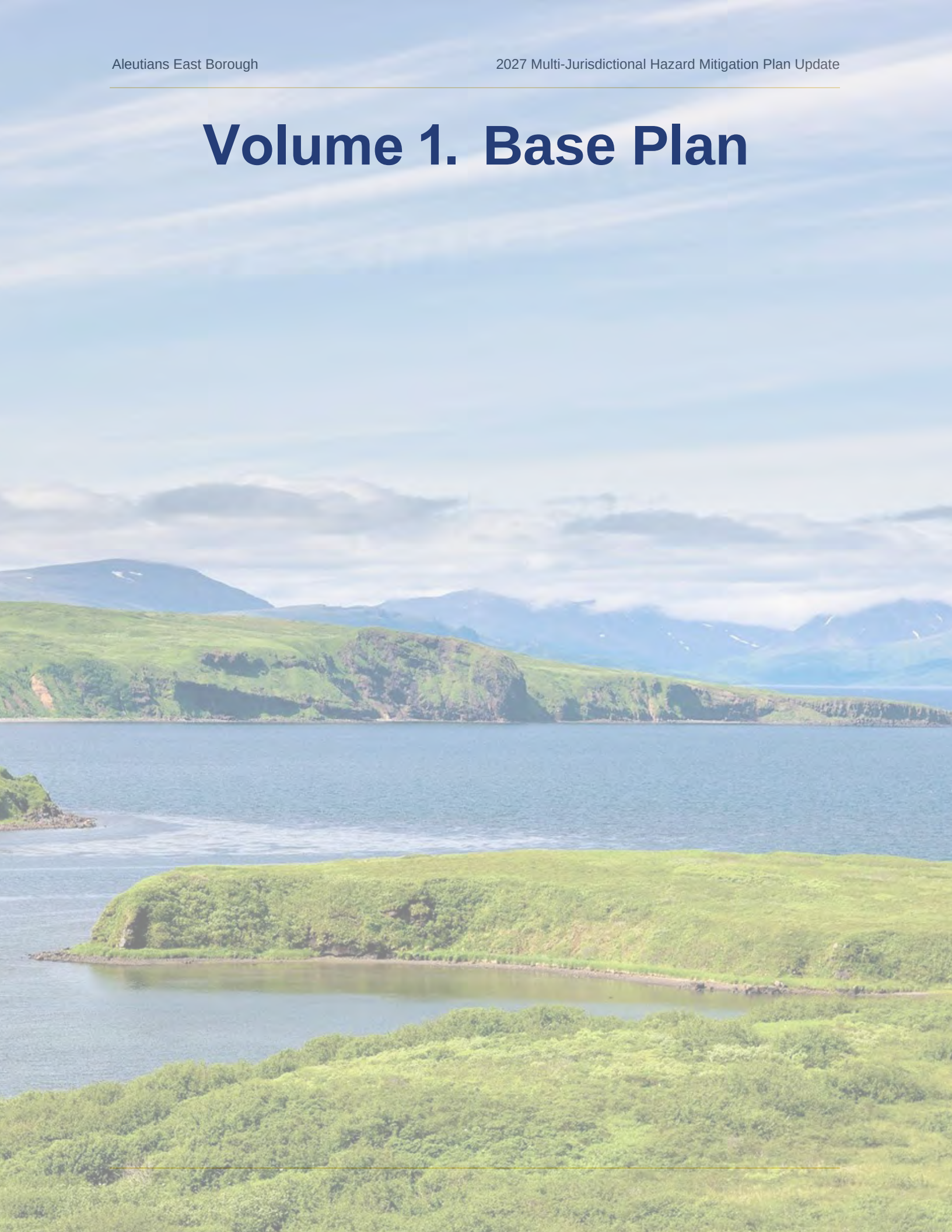
The 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update (MJHMP) builds upon the 2021 Aleutians East Borough MJHMP and 2022 City of Cold Bay Hazard Mitigation Plan by expanding jurisdictional participation, updating and reorganizing the plan framework, and incorporating new and revised hazard profiles.

The update reflects changes in participating jurisdictions, addresses emerging and evolving hazards, and provides a more streamlined structure to support plan implementation.

Key updates to the 2027 Aleutians East Borough MJHMP are summarized below.

- **Added seven (7) new Tribal jurisdictions and one (1) local jurisdiction, bringing the total to 14 participating jurisdictions.** This is a first-edition HMP for the seven new Tribal jurisdictions. The one local jurisdiction, City of Cold Bay, had previously developed a standalone HMP and has now been reincorporated into this MJHMP Update. **All jurisdictions within the Aleutians East Borough are included in the MJHMP Update.**
- **Inclusion of Indigenous and Local Knowledge** to better understand how people experience their environment, how conditions change over time, what places and resources are relied on, and what has helped with adaptation over time.
- **Reformatted the MJHMP** into a **Base Plan** and **Jurisdictional Annex** structure to improve organization, usability, and ease of implementation.
- **Added four (4) new hazard profiles**: Dam Failure, Ground Failure/Landslide, Invasive Species, and Wildland Fire.
- **Created separate and distinct hazard profiles** for Flooding, Sediment Deterioration and Land Destabilization (Erosion), Changes in the Cryosphere- Sea Ice, and Changes in the Cryosphere- Snow Avalanche.
- Formatted the HMP to meet the State of Alaska Department of Homeland Security and Emergency Management (DHS&EM) requirements for local mitigation plans, including the **Executive Summary** requirements (Version 1.5) under **Element H- Additional State Requirements**.

# Volume 1. Base Plan



## Geographic Isolation of the Communities in the Aleutians East Borough

The communities of the Aleutians East Borough are geographically isolated from one another and from major population and service centers in Alaska. The Borough's communities- Akutan, Cold Bay, False Pass, King Cove, and Sand Point- are located along the Alaska Peninsula and Aleutian Chain, where rugged terrain, open water, and long distances limit transportation options. There is no continuous road network connecting the Borough's communities, and many essential goods, services, personnel, and resources must be transported by air or sea.

An average round trip airline ticket from Cold Bay to Anchorage (via Aleutian Airways) is ~$2,000.

This geographic isolation creates a substantial dependence on outside supply chains, particularly for food, fuel, medical supplies, equipment, construction materials, and other essential goods. Anchorage and other regional transportation hubs serve as important sources for supplies entering the Borough, but transporting goods over long distances by air or marine vessel increases both cost and logistical complexity. For example, Aleutian Airways' current cargo rates from Anchorage to Cold Bay and Sand Point are $1.61 per pound for standard freight and $2.58 per pound for priority freight, with a 20 percent fuel surcharge effective April 2026.

The King Cove Airport is reportedly inaccessible for roughly 120 days each year due to weather conditions.

Air transportation provides an essential connection for residents, businesses, and emergency services, but air access can be highly vulnerable to weather. King Cove provides a particularly clear example of this vulnerability. King Cove is not connected by road to any other community, and Alaska Department of Transportation and Public Facilities (DOT&PF) identifies small aircraft and marine transportation as the community's existing means of travel. The proposed 18.9-mile King Cove to Cold Bay Road is intended to provide an overland connection to Cold Bay's all-weather airport, demonstrating the significance of the existing transportation gap for medical care, emergency response, essential services, and routine travel.

Marine transportation provides an important alternative to air travel, but it does not eliminate the Borough's transportation vulnerability. The **Alaska Marine Highway** serves Akutan, Cold Bay, False Pass, King Cove, and Sand Point as part of its Southwest Alaska/Aleutian Chain network. However, service is subject to weather, vessel availability, schedules, and infrastructure conditions. Alaska DOT&PF notes that weather restrictions can limit ferry service in the Southwest region, while recent service notices demonstrate that severe weather and infrastructure conditions can result in delays, cancellations, or operating restrictions. Consequently, when air service is disrupted, marine transportation may provide an alternative, but it may not be immediately available or capable of meeting the community's needs on the same timeframe.

Grant Aviation provides service between Dutch Harbor and Akutan Airport, located on Akun Island six miles away from Akutan Island.

Maritime Helicopters provides the service between Akun (Akutan Airport) to Akutan.

The severity of isolation becomes particularly significant during a hazard event. A volcanic eruption or ashfall, severe storm, earthquake, tsunami, or other emergency may not directly damage a community's infrastructure but can nevertheless disrupt the transportation systems required to sustain it. For example, volcanic ash can prevent aircraft from operating, while severe weather can simultaneously affect marine transportation. If flights and vessels are unable to reach a community, replacement food, fuel, medications, equipment, utility components, and emergency supplies may be delayed. Communities may therefore need to rely on locally available supplies and personnel until transportation connections can be restored. This creates a heightened risk of prolonged isolation during an emergency and makes the availability of adequate local inventories an important component of community resilience.

Geographic isolation also increases the potential consequences of utility and infrastructure disruptions. Because specialized personnel, replacement parts, fuel, and equipment may need to be transported from outside the community, repairs can take longer when transportation is disrupted. A local failure can therefore become more difficult to resolve if the resources required for repair cannot be delivered. The interconnected nature of transportation, utilities, emergency response, health care, and supply chains means that a disruption to one system can affect multiple other systems.

# Subsistence and Food Sovereignty in the Aleutians East Borough

Food security/sovereignty and changing climate conditions are two of Alaska's most daunting challenges. Between 1979 and 2025, the Arctic region, including Alaska, on average, warmed roughly three times faster than the rest of the planet (American Meteorological Society 2026). This significant increase in temperature affects the ability to access traditional hunting, fishing, and gathering areas. **Between 2000 and 2010, over 30% of Alaska Natives were consistently food insecure** and were twice as likely to be food insecure when compared to white populations (Alaska Food Systems 2023).

**Alaskans import 95% of their store-bought food**, which is shipped through long supply chains. In rural Alaska, once supplies enter the state, they are flown/barged into the villages and deliveries are weather dependant. Extreme weather events and seasonality make rural communities, far beyond the end of the road, susceptible to weeks to months without food delivery, and the food that arrives often has a high spoilage rate due to long travel time and poor storage conditions (UAF AFPC 2023).

**The Aleutians East Borough is not connected to Anchorage via a road system and the communities within the Borough are also not connected to each other via a road system; making travel and logistics extremely difficult and expensive.**

Every community in the Aleutians East Borough and its residents are susceptible to food scarcity and are "at the mercy" of food supply chain schedules and limitations.

Alaska's supply chain is vulnerable and in turn, food supply is unstable- this was most recently highlighted by the 2018 earthquake in Southcentral Alaska that disrupted air traffic and the COVID-19 global pandemic with its associated supply chain breakdowns. The Don Young Port of Alaska in Anchorage is the state's primary inbound cargo-handling facility and nearly 80% of the goods entering the state comes through the Port of Alaska.

On February 9, 2022, Alaska Governor Mike Dunleavy issued Administrative Order 3311 establishing the **Alaska Food Security and Independence Task Force**. The task force was charged with being "responsible for recommendations on how to increase all types of food production and harvesting in Alaska, and to identify any statutory or regulatory barriers preventing our state from achieving greater food security (UAF AFPC 2023). A subsequent report was drafted over three months by the University of Alaska Fairbanks and the Alaska Food Policy Council (AFPC) on behalf of the Alaska Food Security and Independence Task Force and was released in March 2023. The report discussed the food insecurity issues in Alaska and provided recommendations for improving Alaska's food security and independence which draw a roadmap for the State administration, legislators, and Alaska's food producers to make Alaska more food secure the next time the supply chain is disrupted (UAF AFPC 2023). Some of their recommendations include:

- Identify barriers that farmers, stock growers, fishermen, mariculture professionals, and others engaged in the growing, harvesting, or raising of food face when starting a business or getting their products into the Alaska market. Provide recommendations on how the State can address those obstacles, including through administrative or statutory changes.
- Assess the levels of wild game and fish harvests in Alaska. Suggest measures that would increase the abundance and harvest of wild game, fish, and food by Alaskans.

**Food Security** means all people have access at all times to enough food for an active, healthy life.

**Food Sovereignty** is the ability of communities to determine the quantity and quality of the food that they consume by controlling how their food is produced and distributed.
It is centered on justice and equity of production, distribution, and consumption of foods, rather than fluctuations in markets and corporate dividends.

**Tenets of Tribal Food Sovereignty**

- Empowers Native households and communities to address issues of hunger and health by cultivating their own healthy, fresh foods
- Re-introduces traditional processes of food production and distribution
- Focuses on food for people
- Values food providers
- Localizes food systems
- Builds knowledge and skills
- Works with nature
- Respects and provides opportunities for local workforce in cultivating and distributing food

Source: USDA 2026

- Recommend a program to assist communities and households impacted by fishery shortfalls and disasters.
- Assess the need for disaster food caches within the State; and how the caches can be developed utilizing Alaskan-sourced foods.
- Identify research needed to support and encourage increased consumption and production of Alaskan foods sourced within the State.

The **Food Security Program at APIA** supports efforts to increase knowledge, access, and the use of traditional and local foods in the Aleutian and Pribilof Region. This has been accomplished through sharing knowledge with individuals and communities about the nutritional, sociocultural, spiritual, and economic benefits of traditional foods while working to develop resources that preserve Unangax̂ knowledge region-wide.

**Appendix D contains a glossary of traditional food terms translated from English to Unangam Tunuu (Aleut).**

The **Food Security Program at APIA** supports efforts to increase knowledge, access, and the use of traditional and local foods in the Aleutian and Pribilof Region. This has been accomplished through sharing knowledge with individuals and communities about the nutritional, sociocultural, spiritual, and economic benefits of traditional foods while working to develop resources that preserve Unangax̂ knowledge region-wide.

**Subsistence is sustenance for the life.**
**Qaqamiiĝux̂ qalgadax̂ anĝaĝix̂ ngiin ax̂tanaa akux̂ (Western/Niiĝuĝim Tunuu)**
**Qaqamiiĝux̂ qalgadam ukulganaa ngiin ugutaasakun (Eastern/Qagaadan Tunuu)**

Source: APIA Food Security Program

# Complementary Knowledge Systems in Hazard Mitigation Planning

Understanding hazard risk requires more than knowing where a hazard may occur or how severely buildings and infrastructure may be damaged. It also requires understanding how people experience their environment, how conditions have changed over time, what places and resources communities depend upon, and what knowledge and practices have helped communities adapt to those conditions.

For thousands of years, Indigenous peoples of the Aleutian region have developed knowledge through direct and sustained relationships with the lands, waters, weather, ecosystems, and hazards of this region. This Indigenous Knowledge (IK) may include observations, experiences, practices, beliefs, and adaptive strategies that are created, maintained, and transmitted across generations through oral histories and storytelling, place names, seasonal observations, subsistence practices, architecture, communal behavior, skill instruction, governance systems, and other cultural practices. IK is often highly place-based and may reflect environmental observations extending well beyond the period covered by instrumental or written records.

The intent is to use multiple ways of knowing to make better hazard mitigation decisions and to better protect the people, places, systems, and ways of life that participating communities value.

Scientific and technical information remain essential components of hazard mitigation planning. Hazard maps, climate projections, engineering studies, historical records, monitoring systems, and quantitative analyses provide important information about hazard location, extent, probability, and potential impacts. IK may provide different or additional information, including observations of past hazard events, environmental changes, traditional travel routes, culturally significant places and resources, subsistence systems, community vulnerabilities, adaptive practices, and resilience mechanisms. These knowledge systems may sometimes address the same question from different perspectives and, in other circumstances, may answer different questions altogether.




***Two Eyed Seeing*** *is a guiding principle that combines the strengths of Indigenous and Western ways of knowing to understand the world*

**One Eye** sees through the strengths of **Indigenous Knowledge**, which is relational, holistic, and place-based.

**The Other Eye** sees through the strengths of **Western knowledge**, which often prioritizes empirical evidence and quantitative analysis.

**Using Both Eyes Together**: Weaves both perspectives without letting one dominate or assimilate the other, creating a fuller picture for the benefit of all.

This MJHMP therefore uses a multiple-evidence approach in which IK, community observations, scientific research, technical analyses, historical records, hazard data, modeling, and other sources of information are considered complementary forms of evidence. The purpose is not to require one knowledge system to validate another or to determine which is superior. Areas of agreement may strengthen understanding of a hazard or vulnerability, while differences may reveal variations in scale or timeframe, changing environmental conditions, information gaps, or areas where additional investigation or community discussion would improve understanding.

This approach is particularly important in the Aleutians East Borough, where geographic isolation, limited monitoring and mapping in some locations, rapidly changing environmental conditions, and the long relationship between communities and the surrounding lands and waters can create limitations in conventional hazard datasets. The Risk Assessment itself identifies several such limitations, including the absence of formal avalanche and landslide mapping in portions of the Planning Area, reliance on local knowledge where formal information is unavailable, and limited tsunami inundation mapping for several historic village lands.

The use of IK in this Plan is also intended to broaden the understanding of what is at risk. Quantitative vulnerability assessments appropriately evaluate people, buildings, critical facilities, infrastructure, and estimated financial exposure. However, communities may also experience significant losses through disruption or damage to

subsistence areas, traditional travel routes, culturally significant places, food systems, environmental resources, community relationships, and practices that support cultural continuity and resilience. Some of these values are difficult or inappropriate to represent through monetary valuation alone.

The integration of IK must also recognize community authority over knowledge. Not all knowledge is intended for public dissemination, and culturally sensitive, sacred, restricted, or location-sensitive information may require protection. The absence of detailed information from this MJHMP should therefore not automatically be interpreted to mean that a resource, place, practice, concern, or body of knowledge is absent or unimportant. Where appropriate, the MJHMP acknowledges the relevance of sensitive information without publicly disclosing details.

Throughout this MJHMP, IK and other community-based knowledge are used alongside scientific and technical information to improve understanding of hazards, vulnerabilities, community capabilities, cultural and environmental values at risk, and potential mitigation opportunities. The intent is not simply to document IK as background or cultural context.

# 1. Plan Introduction and Background

Hazard mitigation planning is required under the Disaster Mitigation Act of 2000 (DMA 2000) which identified the need for Tribal, Local, and State jurisdictions to coordinate mitigation planning and implement mitigation efforts. It also provided the legal basis for the Federal Emergency Management Agency's (FEMA) mitigation plan requirements for mitigation grant assistance.

## 1.1 Purpose

Disasters may cause loss of life, damage buildings and infrastructure, and have devastating effects on a community's economic, social, and environmental well-being. The Aleutians East Borough and participating jurisdictions intend to reduce or eliminate the long-term risk to life and property from hazards by implementing a Hazard Mitigation Plan. The Plan is intended to reduce community risk and promote long-term sustainability by:

- Protecting the public and preventing loss of life and injury.
- Reducing harm to existing and future community assets.
- Preventing damage to a community's cultural, economic, and environmental assets.
- Minimize downtime and speed up recovery following disasters.
- Reducing the costs of disaster response and recovery and the exposure of first responders to risk.
- Help accomplish other community objectives, such as leveraging capital improvements, infrastructure protection, and economic resiliency.

## 1.2 Hazard Mitigation Plan Layout Organization and Description

The 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update is organized into **three volumes** to provide a comprehensive, accessible framework for understanding hazards, assessing community risk, identifying mitigation projects, and implementing long-term risk-reduction measures in the communities of the Aleutians East Borough.

**Volume 1. Base Plan** provides the overall framework for the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update, including the Plan's purpose, planning process, and regional AEB information as it pertains to hazards and risk. It describes the regional approach to identifying and assessing hazards, establishes how mitigation actions were evaluated and prioritized, and outlines how those actions will be implemented, monitored, and evaluated over the five-year planning period. The Base Plan also establishes the Plan Maintenance process, including annual reviews and procedures for keeping the Plan current throughout the five-year cycle, and concludes with a comprehensive reference list documenting the sources and materials used in developing the Plan.

**Volume 2. Jurisdictional Annexes** provides jurisdiction-specific information for each participating jurisdiction in the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update. Each annex identifies the jurisdiction's planning team members and provides information on hazards specific to the jurisdiction, including historical events, impacts, extent, and other relevant hazard characteristics. The annexes also identify critical facilities and assets, assess jurisdictional vulnerability, establish jurisdiction-specific mitigation goals, and present a prioritized mitigation action plan. Additional jurisdictional-specific information, capabilities, and considerations are included to reflect the unique characteristics, risks, needs, and mitigation priorities of each participating jurisdiction.

**Volume 3. Appendices** provides supporting information for this MJHMP including FEMA's Plan Review Tool (PRT), documentation of public outreach activities, and a list of funding resources for the jurisdictions to reference when pursuing funding for mitigation projects.

# 2. Planning Process

This section provides an overview of the planning process; identifies the key collaborators and Planning Team members, documents public outreach efforts, and summarizes the review and incorporation of existing plans, studies, and reports used to update this MJHMP. Meeting information regarding the Planning Team and public outreach efforts are included below and outreach support documents are provided in Appendix B.

This section addresses Element A of the Local Mitigation Plan regulation checklist and a portion of Element A of the Tribal Mitigation Plan regulation checklist.

| **Regulation Checklist- 44 Code of Federal Regulations (CFR) § 201.6 Local Mitigation Plans** |
|---|
| **ELEMENT A. Planning Process** |
| A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))<br>A1-a. Does the plan document how the plan was prepared, including the schedule or time frame and activities that made up the plan's development, as well as who was involved?<br>A1-b. Does the plan list the jurisdiction(s) participating in the plan that seek approval, and describe how they participated in the planning process?<br>A2. Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process (Requirement 44 CFR § 201.6(b)(2))<br>A2-a. Does the plan identify all stakeholders involved or given an opportunity to be involved in the planning process, and how each stakeholder was presented with this opportunity?<br>A3. Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval? (Requirement 44 CFR § 201.6(b)(1))<br>A3-a. Does the plan document how the public was given the opportunity to be involved in the planning process and how their feedback was included in the plan?<br>A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))<br>A4-a. Does the plan document what existing plans, studies, reports and technical information were reviewed for the development of the plan, as well as how they were incorporated into the document? |
| Source: FEMA 2025 (Local) |

| **Regulation Checklist- 44 CFR § 201.7 Tribal Mitigation Plans** |
|---|
| **ELEMENT A. Planning Process** |
| A1. Does the plan document the planning process, including how it was prepared and who was involved in the process? [44 CFR § 201.7(c)(1)]<br>A2. Does the plan document an opportunity for public comment during the drafting stage and prior to plan approval, including a description of how the tribal government defined "public"? [44 CFR § 201.7(c)(1)(i)]<br>A3. Does the plan document, as appropriate, an opportunity for neighboring communities, tribal and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? [44 CFR § 201.7(c)(1)(ii)]<br>A4. Does the plan describe the review and incorporation of existing plans, studies, and reports? [44 CFR § 201.7(c)(1)(iii]<br>A5. Does the plan include a discussion on how the planning process was integrated, to the extent possible, with other ongoing tribal planning efforts as well as other FEMA programs and initiatives? [44 CFR § 201.7(c)(1)(iv)] |
| Source: FEMA 2017 (Tribal) |

## 2.1 Overview of the Planning Process

This Hazard Mitigation Plan was prepared by Fairweather Science, LLC under contract to the Aleutian Pribilof Islands Association (APIA), subaward to the Alaska Native Tribal Health Consortium (ANTHC) using Federal funds under award NA24NOSX473C0101 from the National Oceanic & Atmospheric Administration, U.S. Department of Commerce.

The 2027 HMP Update planning process began in July 2026. The contractor met with APIA Project Management on July 14, 2026, to discuss the project work plan, schedule, and engagement strategy. The contractor facilitated the meetings listed in the table below as well as weekly meetings with APIA Project Management and individual meetings with jurisdiction planning teams during the planning process.

This MJHMP Update follows FEMA Guidance for Mitigation Planning:

- FEMA 2025 Local Mitigation Planning Policy Guide (Effective April 11, 2025).
- FEMA 2019 Tribal Mitigation Planning Handbook, which is a companion to the Tribal Mitigation Plan Review Guide, released by FEMA in 2017.

The following table lists the Planning Teams in each participating jurisdiction that worked on this MJHMP development as well as the Aleutians Pribilof Island Association Project Management Team and consultant team support.

| Planning Team | |
|---|---|
| **Jurisdiction/Organization** | **Name** |
| Aleutians East Borough | Glennora Dushkin<br>Anne Bailey<br>Michael Franklin |
| City of Akutan | Farha Karim<br>Matthew Bereskin<br>Sarah Bereskin<br>Joseph Bereskin<br>Karen Ravenscroft<br>Natasha Bereskin<br>Bob Kirkman<br>Tuna Scanlan<br>Robin Stepetin |
| City of Cold Bay | Lorie Pierce<br>Kurt Uttecht |
| City of False Pass | Nikki Hoblet<br>Wes Shales<br>Stephen Kennedy<br>Carleen Hoblet<br>Michael Franklin<br>Tom Hoblet<br>Hazel Yatchmeneff<br>Sharon Downard<br>Richard Downard<br>Billy Shelikoff |

| Planning Team | |
|---|---|
| **Jurisdiction/Organization** | **Name** |
| City of King Cove | Chris Babcock<br>Amber Jusefowytsch<br>Gary Hennigh<br>Chris Lewis<br>Eric Siweck<br>Michael Franklin<br>Brenda Wilson<br>Robin Gould<br>Warren Wilson<br>Carter (Student participant) |
| City of Sand Point | Debi Schmit<br>Dylan Jacobsen<br>Julius Karlsen<br>Jasmine Sanders<br>Ben Allen<br>Mike Franklin<br>Jack Foster, JR<br>James Smith |
| Agdaagux Tribal of King Cove | Etta Kuzakin |
| Native Village of Akutan | Joe Bereskin<br>Lydia Vinsler<br>Mikita Shangin<br>Ivy Pelkey<br>Haliehana Stepetin |
| Native Village of Belkofski | Delores Kochuten<br>Chris Babcock<br>Chris Lewis<br>Eric Siweck<br>Lynn Farr |
| Native Village of False Pass | Lena Hoblet<br>Hikki Hoblet<br>Carleen Hoblet |
| Native Village of Nelson Lagoon | Angela Johnson<br>Samantha McNeley<br>Melinda Johnson<br>Angela Johnson<br>Felicia Johnson<br>Darren Johnson<br>Mark McNeley |

| Planning Team | |
|---|---|
| **Jurisdiction/Organization** | **Name** |
| | Lila Johnson |
| Pauloff Harbor Tribe | Arlene Gunderson |
| Qagan Tayagungin Tribe of Sand Point | Jason Bjornstad<br>Amy Mack<br>Julius Karlsen<br>Jasmine Sanders<br>Ben Allen<br>Alvin Osterback<br>Dylan Jacobsen |
| Native Village of Unga | Heather Thompson<br>John Foster<br>Amy Foster |
| **Contractor Team** | |
| Fairweather Science, LLC | Laura Young<br>Olivia Kavanaugh<br>Lizzy Dean<br>Malcolm Yerkes<br>Mason Page<br>Cooper Calahan |
| Tidal Basin | Kymmie Scott |
| **Aleutian Pribilof Islands Association Project Team** | |
| Aleutian Pribilof Islands Association | Suanne Unger<br>Karen Pletnikoff<br>Edgar Pinzon |

Table 1 describes Planning Team meetings convened to update this MJHMP, as well as other key dates.

**Table 1- Summary of Planning Team Meetings and Other Key Dates**

| Date | Agenda |
|---|---|
| 7/20/2026 | **Planning Team Kickoff Meeting + Risk Assessment Workshop**<br>Project overview and expedited schedule review; hazard review and identification; hazard history and discussion of significant events; review of data call packet. |
| 8/3/2026 – current | **Public Survey Deployment** |
| 8/31/2026 | **Planning Team Review of Draft Risk Assessment Meeting**<br>Address any Planning Team comments or edits on the Draft Risk Assessment before it is available for public/collaborator review. |

| Date | Agenda |
|---|---|
| 8/27/2026 – 9/18/2026 | **Jurisdictional Mitigation Strategy Meetings**<br>Mitigation strategy meetings with individual jurisdictions to review, select, and prioritize mitigation projects. |
| 9/10/2026 – 9/18/2026 | **Draft Risk Assessment public review and comment period** |
| 9/16/2026 | **Public Meeting (virtual)- Draft Risk Assessment**<br>This virtual meeting was an opportunity for the public to learn about the HMP planning process and provide comments on the Draft Risk Assessment.<br>*Number of members of the public in attendance*: 1 |

## 2.2 Public Involvement

The Aleutians East Borough and participating jurisdictions recognize the importance of community involvement in the HMP planning process and provided multiple opportunities for the public to participate and provide input. Public participation helps ensure that local knowledge, community concerns, and mitigation priorities are considered in the development of the HMP.




The primary methods of public outreach during the planning process were through social media posts, jurisdiction websites, email, and through an online public survey. The survey asked participants to identify hazards that impact their community, indicate their level of concern for each hazard, identify critical facilities and services they rely upon, actions taken to protect their home and property, assess their level of individual preparedness, and provide suggestions for potential mitigation projects.

The survey flyer was shared on the Aleutians East Borough and participating jurisdictions' Facebook pages to promote the survey and encourage community members to provide input during the planning process. Paper flyers were also distributed in hardcopy at public locations in each jurisdiction.

Survey responses were received from residents and community members across each of the participating jurisdictions.

Email notification was also distributed to each jurisdiction's planning team members to share with their community; project collaborators that included businesses within the AEB; non-profits, agencies, and neighboring communities that introduced the project, provided notice of availability of the Draft Risk Assessment and Draft MJHMP and notices for opportunities for public comment at public meetings.




The public was also provided with **two opportunities to review and comment** on the draft Plan during the planning process.

A notice of the availability of the Draft Risk Assessment for public review and comment was published on the AEB's website on September 10, 2026, and then shared on the AEB's Facebook page. The notice was then shared by several jurisdictions via their Facebook pages.

A virtual public meeting was held on September 16, 2026 to provide the public with an opportunity to learn more about the project and provide comments on the Draft Risk Assessment.

Feedback received from the public was used in confirming natural hazards that impact each jurisdiction, level of concern of each hazard, and critical facilities that the public relies on. Images provided by the public were used in the Risk Assessment update, where applicable. Additionally, the Planning Team reviewed the list of mitigation projects that the public suggested; multiple publicly suggested mitigation actions were selected to be included in the jurisdictional Mitigation Action Plans.

Outreach support documents, including public notices and other outreach materials, as well as survey results, are provided in Appendix B.

## 2.3 Collaborators Invited to Participate in the Planning Process

The Aleutians East Borough and participating jurisdictions invited a variety of collaborators with subject matter expertise and local knowledge and experience to participate in the planning process to shape the HMP.

These collaborators included local, Tribal, regional, State, and Federal agencies and organizations, as well as nonprofit organizations, community groups, and neighboring communities.

While FEMA requires coordination with neighboring communities as part of the hazard mitigation planning process, the communities within the Aleutians East Borough are geographically remote and are not connected to one another or surrounding communities by a road system. Air or marine transportation is generally required to travel between communities. Despite these geographic limitations, communities within the Borough coordinate with and rely upon one another for the movement of people and goods, as well as for regional coordination and policy development.

Surrounding communities, including Unalaska (Dutch Harbor) and Anchorage, were also included as local collaborators in the Plan. Invitations to participate in the planning process were extended to the Emergency Managers/Departments of these communities as these communities share similar natural hazards due to their geographic proximity and shared regional setting. A regional approach to hazard mitigation supports coordination of strategies for hazards that may affect multiple communities and recognizes the interconnected nature of transportation, energy, economic, and other critical systems.

The communities also have mutual dependencies and connections through regional transportation networks, including the ferry system. A hazard affecting one community may have cascading or ripple effects throughout the region by disrupting transportation, energy, supply chains, or economic activity. Additionally, many communities in the region have relatively small populations and limited local resources. Coordination with larger regional hubs, particularly Anchorage, may provide opportunities to access additional resources, technical expertise, and support for hazard mitigation initiatives.

Project collaborators listed in Table 2 were notified of the planning process and invited to participate in complete the project survey as well as to review and provide comments on the Draft Risk Assessment and Draft HMP.

- **August 4, 2026:** Notification of Project Kickoff
- **August 8, 2026:** Invitation to complete the project survey.
- **September 14, 2026:** Invitation to review and comment on the Draft Risk Assessment and attend a virtual public meeting.

**Table 2- List of Project Collaborators**

| | Organization |
|---|---|
| AEB Regional | ACE Air Cargo |
| | Alaska Marine Highway |
| | Alaska Village Electric Cooperative |
| | Aleut Corporation |
| | Aleut Foundation |
| | Aleut Marine Mammal Commission |
| | Aleutian Housing Authority |
| | Aleutian Pribilof Island Community Development Association |
| | Aleutian Pribilof Islands Association |
| | Aleutians East Borough School District |
| | Eastern Aleutian Tribes |
| | Grant Aviation |
| | Lake Clark Air |
| | Precision Air Alaska |
| Local/Jurisdictional | Akutan Corporation |
| | Akutan Electric Utility |
| | Akutan Fisheries Association |
| | Akutan Roadhouse, Inc. |
| | Akutan School |
| | Alaska Commercial Company (King Cove) |
| | Aleutian Adventures |
| | Aleutian Longline Company |
| | Anesia Kudrin Memorial Clinic (Akutan) |
| | Anna Livingston Memorial Clinic (Cold Bay) |
| | Belkofski Corporation |
| | False Pass Fisheries Development Association |
| | False Pass Safety Department |
| | False Pass School |
| | Frosty Fuels (Cold Bay) |
| | Isanotski Corporation (False Pass Corporation) |
| | King Cove Corporation |
| | King Cove Fire and Rescue |
| | King Cove Holdings (Subsidiary of King Cove Corporation) |
| | King Cove School |
| | Nelson Lagoon Corporation |
| | Nelson Lagoon Electrical Cooperative, Inc. |
| | Nelson Lagoon Fishermen’s Association |
| | Nelson Lagoon Storage Company |
| | Sanak Corporation (Pauloff Harbor) |
| | Sand Point Medical Clinic |
| | Sand Point School |
| | Shumagin Corporation (Sand Point) |
| | Silver Bay Seafoods - False Pass, LLC |

| Organization | |
|---|---|
| | Trident Seafoods |
| | Unga Corporation |
| State | Alaska Dam Safety Program |
| | Alaska Department of Commerce, Community, and Economic Development (DCCED)- Division of Community and Regional Affairs (DCRA) - Disaster Recovery & Mitigation |
| | Alaska Department of Commerce, Community, and Economic Development (DCCED)- Risk MAP Program |
| | Alaska Department of Commerce, Community, and Economic Development (DCCED)- State Floodplain Coordinator |
| | Alaska Department of Environmental Conservation (DEC)- Division of Spill Prevention and Response (DSPR) |
| | Alaska Department of Environmental Conservation (DEC)- Tribal Liaison |
| | Alaska Department of Health and Social Services (DHSS) |
| | Alaska Department of Homeland Security and Emergency Management (DHS&EM) |
| | Alaska Department of Natural Resources (DNR)- Division of Forestry & Fire Protection (DFFP) |
| | Alaska Department of Natural Resources (DNR)- Division of Geological & Geophysical Surveys (DGGS)- Coastal Hazards, Geology, Flooding |
| | Alaska Department of Natural Resources (DNR)- Division of Mining, Land, and Water (DMLW) |
| | Alaska Department of Public Safety |
| | Alaska State Troopers |
| | University of Alaska Fairbanks- Alaska Center for Climate Assessment & Policy (ACCAP) |
| | University of Alaska Fairbanks- Alaska Earthquake Center (AEC) |
| | University of Alaska Fairbanks- Scenarios Network for Alaska + Arctic Planning (SNAP) |
| Federal | Bureau of Indian Affairs (BIA)- Tribal Climate Resilience |
| | Bureau of Indian Affairs (BIA)- Tribal Operations |
| | Bureau of Land Management (BLM)- Alaska State Office |
| | FEMA Region 10 |
| | National Oceanic and Atmospheric Administration (NOAA)- Regional Preparedness |
| | National Weather Service (NWS)- Fairbanks |
| | U.S. Department of Agriculture (USDA)- Rural Development |
| | U.S. Department of Housing and Urban Development (HUD) |
| | U.S. Environmental Protection Agency (EPA)- Alaska Native Village Programs |
| | U.S. Geological Survey (USGS)- Alaska Science Center |
| | U.S. Geological Survey (USGS)- Alaska Volcano Observatory (AVO) |
| | United States Army Corps of Engineers (USACE)- Alaska Division |
| | United States Coast Guard (USCG)- Alaska |
| | US Fish and Wildlife Service (USFWS)- Izembek National Wildlife Refuge |
| Non-Profit | Alaska Native Tribal Health Consortium (ANTHC) |
| | Denali Commission |
| | First Alaskans Institute |
| | Marine Conservation Alliance |
| | RurAL CAP- Housing Director |
| Other | Municipality of Anchorage- Emergency Manager (neighboring jurisdiction) |
| | City of Unalaska- Emergency Preparedness/Police Department (neighboring jurisdiction) |

## 2.4 Indigenous Knowledge Research and Integration

As part of the 2027 MJHMP Update, the planning process included a focused effort to identify and meaningfully integrate Indigenous Knowledge (IK), local knowledge, community observations, and information regarding cultural and subsistence systems that may contribute to understanding hazards, vulnerability, resilience, and mitigation opportunities. This effort was intended to move beyond documenting IK solely as community background or cultural context and instead evaluate how relevant findings could inform required elements of the hazard mitigation planning process.

A project-specific **Indigenous Knowledge Framework for Mitigation Planning** was developed and used to guide this work. The framework recognizes IK as a distinct knowledge system and applies a multiple-evidence approach in which IK, community observations, scientific studies, technical analyses, historical records, hazard data, and other information sources may contribute complementary perspectives. It also emphasizes that IK is often place-based and interconnected with culture, identity, subsistence, community relationships, and responsibilities to place.

An **IK Tracking Workbook** was developed and populated to support a consistent and traceable review process. Findings were organized by source, community, knowledge system and type, hazard relevance, potential consequences, values at risk, validation status, supporting information, relevant HMP elements, potential mitigation opportunities, and follow-up needs. The workbook was used as an analytical bridge between source material and the HMP, helping the planning team identify where community knowledge could strengthen the Risk Assessment, Vulnerability Assessment, Capability Assessment, Mitigation Strategy, and Plan Maintenance process. The workbook also helped distinguish community-provided knowledge from planning-team interpretation and identify information requiring additional validation, research, or community review.

Sources reviewed through this process included jurisdiction-provided information, published literature documenting Indigenous and local knowledge, community observations already incorporated into draft planning materials, and scientific or technical information used to provide context or identify areas of agreement, difference, or uncertainty. Information was evaluated for planning relevance rather than collected for documentation alone.

**Not all IK identified through the planning process is appropriate for inclusion in a public document.** Cultural, sacred, location-sensitive, restricted, or otherwise sensitive information may require protection. Where appropriate, this MJHMP therefore acknowledges that important knowledge, places, resources, or relationships exist without publishing sensitive details. Community authority, source attribution, and knowledge stewardship were considered during evaluation and incorporation of findings.

## 2.5 Review and Incorporation of Existing Plans, Studies, and Reports

During this MJHMP update, the contractor reviewed and incorporated pertinent information from available resources. Newly collected data included available plans, studies, reports, and technical research listed in Table 3 and in the individual jurisdiction annexes (Section 3). The new data was reviewed and referenced throughout the document.

A complete list of references used in this MJHMP is provided in Section 6.

**Table 3- Existing Plans, Studies, and Reports Reviewed and Incorporated**

| Plans/Study/Report/etc. | Contents Summary | Data Incorporation |
|---|---|---|
| **2023 State of Alaska Hazard Mitigation Plan** | Defines statewide hazards, history, extent, probability, future conditions. | Compared hazard profiles, history, and impacts of events for risk assessment. Used statewide GIS hazard layers as foundation of the Vulnerability Assessment. |
| **2010 & 2021 Aleutians East Borough MJHMP** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **2022 City of Cold Bay HMP** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **2007 USACE Erosion Information Papers- False Pass, King Cove, Nelson Lagoon, Sand Point** | Baseline erosion assessment of the community. | Used to describe historical erosion locations, rates, and impacts in the communities where reports were available. |
| **USCG 2025. Arctic and Western Alaska Area Contingency Plan. U.S. Coast Guard Sector Western Alaska and U.S. Arctic and State of Alaska Department of Environmental Conservation.** | This is an operational plan intended to support individuals in response roles in the Arctic and Western Alaska Area. | Data in this plan was reviewed to inform this HMP Update. |
| **Vaught, D. 2016. Nelson Lagoon, Alaska Wind and Solar Resource Assessment Report** | This report summarizes wind data to inform the development of wind energy resources. | Data in this plan was reviewed to inform this HMP Update; specifically, the Severe Weather section of the Risk Assessment. |
| **USACE 2009. Alaska Baseline Erosion Assessment, Study Findings and Technical Report. U.S. Army Corps of Engineers Alaska District. March 2009.** | Baseline erosion assessment. | Data in this plan was reviewed to inform this HMP Update; specifically, the Risk Assessment section for Sediment Deterioration and Land Destabilization. |
| **USACE National Inventory of Dams Database** | Database that provides information on all dams in the United States. | Information on dams in the AEB was used in the Dam Failure profile/annex |
| **UAF/SNAP Climate Tools** | Provides historical data and future projections on future climate conditions impacts, wildfire danger, and other applicable hazards. | Cited several figures and other data in hazard profiles/annexes. |
| **DHS&EM Disaster Cost Index- Updated March 18, 2026** | Provides details for historic statewide disasters. | Incorporated relevant disaster descriptions in each applicable hazard profile to strengthen the hazard history, extent, and impact sections. |

| Plans/Study/Report/etc. | Contents Summary | Data Incorporation |
|---|---|---|
| **Alaska Federation of Natives 2018. Erosion and Alaska Native Communities.** | This report is focused on communities in Western and Arctic Alaska, however, it includes information on regional erosion trends relevant to this HMP Update. | Data in this plan was reviewed to inform this HMP Update. |
| **ANTHC 2024. Alaska Native Tribal Health Consortium. The Unmet Needs of Environmentally Threatened Alaska Native Villages.** | This report details climate and environmental threats to infrastructure from erosion, flooding, and permafrost degradation. A representative from Nelson Lagoon participated in the development of this plan and participated in workshops informing the report's assessment and recommendations. | Data in this plan was reviewed to inform this HMP Update, specifically related to erosion and flooding. |
| **A.R. Mahoney 2018. NOAA. Arctic Report Card: Update for 2018.** | This report describes the role of landfast ice in coastal sea ice systems. | Data in this plan was reviewed to inform this HMP Update, specifically to inform the Risk Assessment section for changes in cryosphere – sea ice. |
| **IPCC 2019. IPCC Special Report on the Ocean and Cryosphere in a Changing Climate** | This report assesses new data on how the ocean and cryosphere have and are expected to change, as well as associated risks, opportunities, and mitigation strategies. | Data in this plan was reviewed to inform this HMP Update; specifically, to inform the Future Climate Conditions sections in the Risk Assessment. |
| **UAF ACCAP 2026. University of Alaska Fairbanks Alaska Center for Climate Assessment and Preparedness Sea Ice Atlas Report for Alaska and the Arctic 1850 to December 2025.** | Historical sea ice extent. | Data in this plan was reviewed to inform this HMP Update. |
| **Denali Commission 2019. Statewide Threat Assessment: Identification of Threats from Erosion, Flooding, and Thawing Permafrost in Remote Alaska Communities.** | This report assessed threats to public infrastructure associated with erosion, flooding, and thawing permafrost and evaluated the combined threat of these hazards. | Data in this plan was reviewed to inform this HMP Update; specifically, evaluations of hazard risk for erosion and flooding were included in this HMP Update |
| **Buzard, R. et al. 2024. Current and Projected Flood Exposure for Alaska Coastal Communities.** | This report used observation-based methods to estimate record flood elevations in Alaska communities. | Data in this plan was reviewed to inform this HMP Update; specifically, historic records were reviewed for inclusion in the Risk Assessment Flooding Profile. |
| **DGGS Tsunami Inundation Reports and Maps for Akutan, Cold Bay, False Pass, King Cove, Nelson Lagoon, Sand Point** | Identify potential tsunami hazards for the geographies and model the extent of tsunami waves generated earthquake and landslide events. | Referenced data in Tsunami hazard profile/annex. Used inundation maps as the data source for potential losses due to tsunami event. |
| **BOEM 2012. Subsistence Study for the North Aleutian Basin** | Subsistence Study on the people and subsistence activities. Investigates subsistence and commercial harvests across communities. | Used for Indigenous Knowledge context in development of the MJHMP. |

# 3. Risk Assessment

This section identifies and profiles the hazards that could affect the Aleutians East Borough (AEB) and Participating Jurisdictions- also referred to as the Aleutians East Borough Planning Area or "Planning Area".

This section addresses a portion of Element B of the Local and Tribal Mitigation Plans regulation checklists and a portion of Element G of the Local Mitigation Plans regulation checklist.

| Regulation Checklist- 44 CFR § 201.6 Local Mitigation Plans |
|---|
| **ELEMENT B. Risk Assessment** |
| B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events? (Requirement 44 CFR § 201.6(c)(2)(i))<br>B1-a. Does the plan describe all natural hazards that can affect the jurisdiction(s) in the Planning Area, and does it provide the rationale if omitting any natural hazards that are commonly recognized to affect the jurisdiction(s) in the Planning Area?<br>B1-b. Does the plan include information on the location of each identified hazard?<br>B1-c. Does the plan describe the extent for each identified hazard?<br>B1-d. Does the plan include the history of previous hazard events for each identified hazard?<br>B1-e. Does the plan include the probability of future events for each identified hazard, including the type, location and range of anticipated intensities?<br>B1-f. For participating jurisdictions in a multi-jurisdictional plan, does the plan describe any hazards that are unique to and/or vary from those affecting the overall planning area? |
| Source: FEMA 2025 (Local) |

| Regulation Checklist- 44 CFR § 201.6 Local Mitigation Plans |
|---|
| **ELEMENT G. High Hazard Potential Dams (HHPD) (Optional)** |
| HHPD1. Did the plan describe the incorporation of existing plans, studies, reports and technical information for HHPDs?<br>HHPD1-a. Does the plan describe how the local government worked with local dam owners and/or the state dam safety agency?<br>HHPD1-b. Does the plan incorporate information shared by the state and/or local dam owners?<br>HHPD2. Did the plan address HHPDs in the risk assessment?<br>HHPD2-b. Does the plan document the limitations and describe how to address deficiencies? |
| Source: FEMA 2025 (Local) |

| Regulation Checklist- 44 CFR § 201.7 Tribal Mitigation Plans |
|---|
| **ELEMENT B. Hazard Identification and Risk Assessment** |
| B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the tribal planning area? [44 CFR § 201.7(c)(2)(i)]<br>B2. Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for the tribal planning area? [44 CFR § 201.7(c)(2)(i)]<br>B3. Does the plan include a description of each identified hazard's impact of the tribal planning area? [44 CFR §201.7(c)(2) (ii)] |
| Source: FEMA 2017 (Tribal) |

***This Risk Assessment is organized to address the above requirements in the Base Plan that focuses on Aleutians East Borough regional information related to the hazards identified by each participating jurisdiction.***

***Jurisdiction-specific hazard details can be found in Volume 2. Jurisdictional Annexes.***

## 3.1 Hazard Identification and Screening

Each jurisdiction screened a comprehensive list of natural hazards and selected those that may impact their geography. Due to the jurisdictions' geography and reliance on outside services, impacts to **Transportation Services**, **Utility Systems**, and **Subsistence Resources** are discussed within each hazard profile. Where supported by available information, hazard profiles also incorporate local observations and Indigenous Knowledge regarding environmental conditions, hazard impacts, subsistence resources, and community vulnerability.

The specific hazards selected by the Planning Team for profiling have been examined based on the following factors:

- **Nature** (type)
- **History** (previous occurrences)
- **Location** (hazard areas)
- **Extent** (includes magnitude and severity)
- **Impact** (provides general impacts associated with each hazard). Impacts associated with transportation, utility disruption, and subsistence resources are addressed in each hazard.
- **Probability of Future Events** (likelihood of hazard occurring)
- **Future Climate Conditions** (how the hazard is projected to change in the future, including changes in the nature, location, extent, impacts, and probability)

Note that although a jurisdiction may select a hazard, the Aleutians East Borough as a separate jurisdiction, may not consider all identified hazards to be a concern for the Borough or its assets. All jurisdictions selected their hazards independently of one another.

**Note: This Risk Assessment includes three displaced/relocated Tribal jurisdictions: the Native Village of Belkofski, the Native Village of Unga, and the Pauloff Harbor Tribe. For these Tribes, hazard risk is assessed for both their historical village geographies and the communities where Tribal members predominantly reside today: Belkofski Village and King Cove for the Native Village of Belkofski; Unga Village/Unga Island and Sand Point for the Native Village of Unga; and Pauloff Harbor Village/Sanak Island and Sand Point for the Pauloff Harbor Tribe. This approach recognizes that present-day residential location alone does not fully represent Tribal exposure, vulnerability, or values at risk. Historical village lands and surrounding traditional-use areas may continue to be important for subsistence activities, cultural relationships, land ownership and stewardship, and other Tribal uses even where year-round residential populations are limited or absent. Consequently, hazards may affect these Tribal jurisdictions differently across their historical and contemporary geographies. The jurisdictional annexes provide additional information regarding these distinctions and the risks associated with each geography.**

| | Jurisdiction | | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Dam Failure | Earthquake | Flood | Ground Failure/ Landslide | Invasive Species | Sediment Deterioration and Land Destabilization | Severe Weather | Tsunami | Volcano | Wildland Fire |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Local Jurisdiction | Aleutians East Borough | | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| | City of Akutan | | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | City of Cold Bay | | ✓ | | | ✓ | | | ✓ | | ✓ | | ✓ | |
| | City of False Pass | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | City of King Cove | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | City of Sand Point | | | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Tribal Jurisdiction | Agdaagux Tribe of King Cove* | | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| | Native Village of Akutan* | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Native Village of False Pass* | | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| | Native Village of Nelson Lagoon | | ✓ | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| | Qagan Tayagungin Tribe of Sand Point* | | | | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | |
| | Native Village of Belkofski* | Belkofski Village | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | King Cove | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | Native Village of Unga* | Unga Village/ Unga Island | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | Sand Point | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Pauloff Harbor Tribe* | Pauloff Harbor Village/ Sanak Island | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | Sand Point | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

* New jurisdiction in this MJHMP Update

Green checkmark indicates that this is a new hazard for this jurisdiction

Each hazard is assigned a rating based on the following criteria for magnitude/severity (Table 4) and probability of future events (Table 5). Estimating magnitude and severity are determined based on historic events using the criteria identified in the following tables.

**Table 4- Hazard Extent (Magnitude/Severity) Criteria**

| Magnitude / Severity | Criteria |
|---|---|
| 4- Catastrophic | • Multiple deaths.<br>• Complete shutdown of facilities for 30 or more days.<br>• More than 50 percent (%) of property is severely damaged. |
| 3- Critical | • Injuries and/or illnesses result in permanent disability.<br>• Complete shutdown of critical facilities for at least two weeks.<br>• More than 25% of property is severely damaged. |
| 2- Limited | • Injuries and/or illnesses do not result in permanent disability.<br>• Complete shutdown of critical facilities for more than one week.<br>• More than 10% of property is severely damaged. |
| 1- Negligible | • Injuries and/or illnesses are treatable with first aid.<br>• Minor quality of life lost.<br>• Shutdown of critical facilities and services for 24 hours or less.<br>• Less than 10% of property is severely damaged. |
| 0- Not Applicable | • Hazard was not assessed |

**Table 5- Hazard Probability of Future Events Criteria**

| Probability | Criteria |
|---|---|
| 4- Highly Likely | • Event is probable within the calendar year.<br>• Event has up to 1 in 1 year chance of occurring (1/1=100%).<br>• History of events is greater than 33% likely per year. |
| 3- Likely | • Event is probable within the next three years.<br>• Event has up to 1 in 3 years chance of occurring (1/3=33%).<br>• History of events is greater than 20% but less than or equal to 33% likely per year. |
| 2- Possible | • Event is probable within the next five years.<br>• Event has up to 1 in 5 years chance of occurring (1/5=20%).<br>• History of events is greater than 10% but less than or equal to 20% likely per year. |
| 1- Unlikely | • Event is possible within the next ten years.<br>• Event has up to 1 in 10 years chance of occurring (1/10=10%).<br>• History of events is less than or equal to 10% likely per year. |
| 0- Not Applicable | • Hazard was not assessed |

The table below summarizes the probability and magnitude/severity of each hazard identified by the jurisdictional Planning Teams, along with a brief narrative describing each hazard.

**The overall probability and magnitude/severity ratings presented in the table represent the highest rating assigned to any jurisdiction within the Aleutians East Borough, rather than an average of the ratings across jurisdictions.**

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere-Sea Ice | 3- Likely | 3- Critical | Sea ice is a multifaceted hazard that can cause direct damage through runup, as well as indirect impacts from transportation disruptions and increased exposure to sediment deterioration during severe storms.<br>The geographies of Cold Bay, False Pass, Nelson Lagoon, Sand Point, and Unga Village identified sea ice (the presence of sea ice as well as the lack of sea ice) as a potential hazard. |
| Cryosphere-Snow Avalanche | 2- Possible | 4- Catastrophic | The Aleutians East Borough Planning Area is vulnerable to avalanches due to its steep and rugged mountainous terrain, heavy snowfall, strong winds, and rapidly changing winter weather conditions. Avalanches can occur on steep slopes and may be triggered by heavy snowfall, wind loading, rain, warming temperatures, or seismic activity.<br>Due to a lack of LiDAR data, or other forms of mapping, avalanche hazard areas and risk in the Aleutians East Borough Planning Area are not well defined.<br>The geographies of Akutan, King Cove, Belkofski Village, and Unga Village/Unga Island identified snow avalanche as a potential hazard. |
| Dam Failure | 2- Possible | 3- Critical | There are 7 dams in the Aleutians East Borough Planning Area, but no dams have failed historically.<br>Three (3) dams are proposed to be classified as High Hazard Potential Dams by the State of Alaska Dam Engineer, one (1) dam is classified as a High Hazard Potential Dam by the State of Alaska Dam Engineer, two (2) dams are classified as Significant Hazard Potential Dam by the State of Alaska Dam Engineer, and one (1) dam has an unknown hazard potential.<br>Dams are located in Akutan, False Pass, King Cove, Sand Point, and Unga Island. |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough Planning Area spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap. The Aleutians East Borough Planning Area region frequently experiences earthquakes with a magnitude of 6.0 and greater. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts.<br>All geographies/communities in the Aleutians East Borough Planning Area are vulnerable to earthquake hazards. |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Flood | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough Planning Area is situated between the Gulf of Alaska and the Bering Sea and low-lying regions of the Borough are susceptible to coastal flooding and resultant impacts.<br>All communities in the Aleutians East Borough Planning Area besides Cold Bay are vulnerable to coastal flooding hazards. Riverine flooding, such that experienced in Interior Alaska, is not a hazard for the Aleutians East Borough. As Cold Bay is located 100 feet above sea level, coastal flooding is not a concern for the community. |
| Ground Failure/ Landslide | 2- Possible | 4- Catastrophic | The Aleutians East Borough Planning Area is vulnerable to landslides because of its steep, rugged terrain, unstable slopes, volcanic geology, and frequent precipitation. Landslides may be triggered or intensified by heavy rainfall, snowmelt, earthquakes, volcanic activity, and sediment deterioration.<br>Due to a lack of LiDAR, or other forms of mapping, landslide hazard areas and risk in the Aleutians East Borough Planning Area are not well defined.<br>The communities of Akutan, False Pass, King Cove, Belkofski Village, Pauloff Harbor/Sanak Island, and Unga Village/Unga Island identified landslide as a potential hazard. |
| Invasive Species | 3- Likely | 2- Limited | The location of the Aleutians East Borough Planning Area strongly influences the spread of invasive species because it serves as a gateway for marine transportation while its geographic isolation shapes how species are introduced, established, and dispersed.<br>The categories of invasive species that currently pose the greatest risk to the Aleutians East Borough Planning Area are terrestrial plants, aquatic animals, and terrestrial animals.<br>Invasive species are a concern for the communities of Akutan, Cold Bay, False Pass, King Cove, Sand Point, Belkofski Village, Pauloff Harbor Village/Sanak Island, and Unga Village/Unga Island.<br>Species of greatest concern are rats, European black slug, and several species of plants, including Orange Hawkweed and Oxeye Daisy. |
| Sediment Deterioration and Land Destabilization | 4- Highly Likely | 3- Critical | The Aleutians East Borough Planning Area is highly vulnerable to coastal sediment deterioration and land destabilization due its location between the Gulf of Alaska and the Bering Sea. Communities in the Aleutians East Borough Planning Area and critical infrastructure are located along exposed coastlines subject to strong winds, waves, storm surge, changing sea ice conditions, and severe storms.<br>All communities in the Aleutians East Borough Planning Area besides Cold Bay are vulnerable to sediment deterioration and land destabilization hazards. As Cold Bay is located 100 feet above sea level, sediment deterioration and land destabilization is not a concern for the community.<br>The community of Nelson Lagoon, located on the Bering Sea, is experiencing shoreline loss at the highest rate in the Aleutians East Borough. |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Severe Weather | 4- Highly Likely | 3- Critical | The entire Aleutians East Borough Planning Area experiences periodic severe weather events such as dense fog, drought, extreme cold, heavy rain, heavy snow, and high winds.<br>All communities in the Aleutians East Borough Planning Area are vulnerable to severe weather hazards, with high winds as the most frequent severe weather hazard. |
| Tsunami | 3- Likely | 4- Catastrophic | The Aleutians East Borough Planning Area is highly exposed to tsunami hazards because of its proximity to the Alaska-Aleutian subduction zone and location along the Gulf of Alaska and Bering Sea. The Aleutians East Borough Planning Area region frequently experiences earthquakes with a magnitude of 6.0 and greater, which frequently have the potential of generating a tsunami.<br>Because of the proximity of major seismic sources, locally generated tsunamis may provide little warning time to the communities in the Aleutians East Borough.<br>All communities in the Aleutians East Borough Planning Area besides Cold Bay are vulnerable to tsunami hazards. As Cold Bay is located 100 feet above sea level, tsunamis are unable to propagate onto land, which is further supported by formal tsunami inundation mapping. |
| Volcano | 4- Highly Likely | 3- Critical | The Aleutians East Borough Planning Area is located within the Pacific Ring of Fire and contains or is located near numerous active and potentially active volcanoes.<br>Volcanic activity can affect communities in the Aleutians East Borough through ashfall, volcanic gases, lava, pyroclastic material, and other volcanic hazards. Volcanic ash is a particular concern because it can reduce air quality, contaminate water supplies, affect aircraft and airport operations, damage equipment, disrupt utilities, and interrupt scheduled air transportation. The remote location of communities in the Aleutians East Borough and their reliance on air and marine transportation can increase the consequences of volcanic activity and ashfall.<br>All communities in the Aleutians East Borough Planning Area are vulnerable to volcano hazards, particularly volcanic ashfall. |
| Wildland Fire | 2- Possible | 2- Limited | The Aleutians East Borough Planning Area has a relatively low wildfire risk compared with many areas of mainland Alaska because of its cool, wet maritime climate and limited forested vegetation. However, wildfires can occur in grass, tundra, brush, and other available fuels, particularly during periods of dry weather, warm temperatures, and strong winds.<br>The communities of Akutan, Sand Point, Pauloff Harbor Village/Sanak Island, and Unga Village/Unga Island are particularly concerned about the potential for a fire to spread.<br>Historical fires in the Aleutians East Borough were the result of human negligence (debris burning, campfires, cooking fires) as compared to lighting strikes. |

This table summarizes the probability and magnitude ratings for each geography

| | | Cryosphere-Sea Ice | | Cryosphere-Snow Avalanche | | Dam Failure | | Earthquake | | Flood | | Ground Failure/ Landslide | | Invasive Species | | Sediment Deterioration and Land Destabilization | | Severe Weather | | Tsunami | | Volcano | | Wildfire | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Probability | Magnitude | Probability | Magnitude | Probability | Magnitude | Probability | Magnitude | Probability | Magnitude | Probability | Magnitude | Probability | Magnitude | Probability | Magnitude | Probability | Magnitude | Probability | Magnitude | Probability | Magnitude | Probability | Magnitude |
| Geography | Aleutians East Borough Region | 3 | 3 | 2 | 4 | 2 | 3 | 4 | 4 | 4 | 4 | 2 | 4 | 3 | 2 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 2 | 2 |
| | Akutan | 0 | 0 | 2 | 4 | 2 | 3 | 4 | 4 | 3 | 4 | 2 | 4 | 3 | 2 | 3 | 2 | 4 | 3 | 3 | 4 | 4 | 3 | 2 | 2 |
| | Cold Bay | 2 | 2 | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 4 | 3 | 0 | 0 | 4 | 3 | 0 | 0 |
| | False Pass | 2 | 2 | 0 | 0 | 2 | 3 | 4 | 4 | 3 | 2 | 2 | 4 | 0 | 0 | 2 | 2 | 4 | 3 | 3 | 4 | 4 | 3 | 0 | 0 |
| | King Cove | 0 | 0 | 2 | 4 | 2 | 3 | 4 | 4 | 3 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 4 | 3 | 3 | 4 | 4 | 3 | 0 | 0 |
| | Belkofski Village | 0 | 0 | 2 | 4 | 0 | 0 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 3 | 3 | 4 | 4 | 3 | 0 | 0 |
| | Sand Point | 2 | 2 | 2 | 3 | 2 | 3 | 4 | 4 | 3 | 4 | 0 | 0 | 3 | 2 | 2 | 2 | 4 | 3 | 3 | 3 | 4 | 3 | 2 | 2 |
| | Pauloff Harbor/Sanak Island | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 2 | 2 |
| | Unga Village/Unga Island | 2 | 2 | 2 | 2 | 2 | 3 | 4 | 4 | 3 | 4 | 2 | 2 | 3 | 2 | 2 | 2 | 4 | 3 | 3 | 4 | 4 | 3 | 2 | 2 |
| | Nelson Lagoon | 3 | 3 | 0 | 0 | 0 | 0 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 0 | 4 | 3 | 4 | 3 | 2 | 4 | 4 | 3 | 0 | 0 |

### 3.1.1 Hazards Not Profiled in this HMP Update

This HMP Update includes organizational changes to align with the State of Alaska HMP. One of those changes includes the separate categories of Changes in the Cryosphere – those categories include Permafrost/Periglacial, Glacier, Avalanche, and Sea Ice.

#### 3.1.1.1 Changes in the Cryosphere- Permafrost/Periglacial

Permafrost is found beneath nearly 85% of Alaska. It is thickest and most extensive in arctic Alaska north of the Brooks Range, present virtually everywhere and extending as much as 2,000 feet below the surface of the Arctic Coastal Plain. Southward from the Brooks Range it becomes increasingly thinner and more discontinuous, broken by pockets of unfrozen ground, known as taliks, until it becomes virtually absent in Southeast Alaska and the Aleutian Islands, except for patches of high-elevation alpine permafrost.

The 2023 State of Alaska HMP identifies statewide permafrost hazard areas and associated risk (Figure 1). In the Aleutians East Borough Planning Area, permafrost is associated with Mount Shishaldin (west of False Pass) and Frosty Peak Volcano (south of Cold Bay). Due to the remote locations of these volcanoes and lack of infrastructure in the area, the Planning Team indicated that permafrost-resultant hazards (permafrost degradation and subsidence) are not of concern.

#### 3.1.1.2 Changes in the Cryosphere- Glacier

Glaciers are made of compressed snow that has survived summer and transformed into ice. Over many years, layers of accumulated ice build into large, thickened ice masses.

The 2023 State of Alaska HMP identifies statewide glacial hazard areas and associated risk (Figure 2). In the Aleutians East Borough, glacial hazard areas are associated with Isanotski Peaks (west of False Pass) and Frosty Peak Volcano (south of Cold Bay). Due to the remote locations of these volcanoes and glaciers, and lack of infrastructure in the area, the Planning Team indicated that glacial-resultant hazards (calving, ice falls, ice avalanches, glacier detachments, glacial lake outburst floods, and glacier surges) are not of concern.

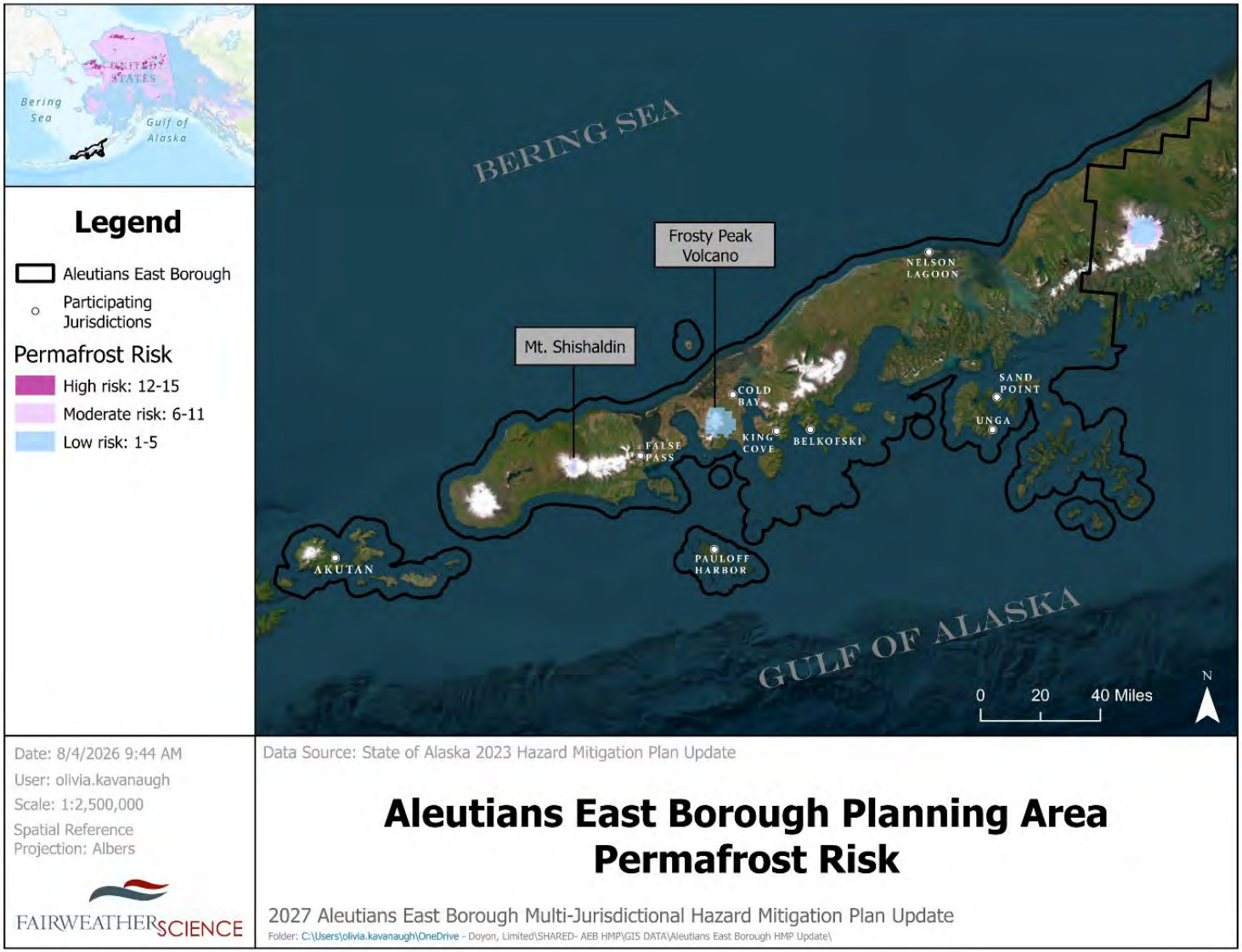



**Figure 1- AEB Planning Area Permafrost Risk**

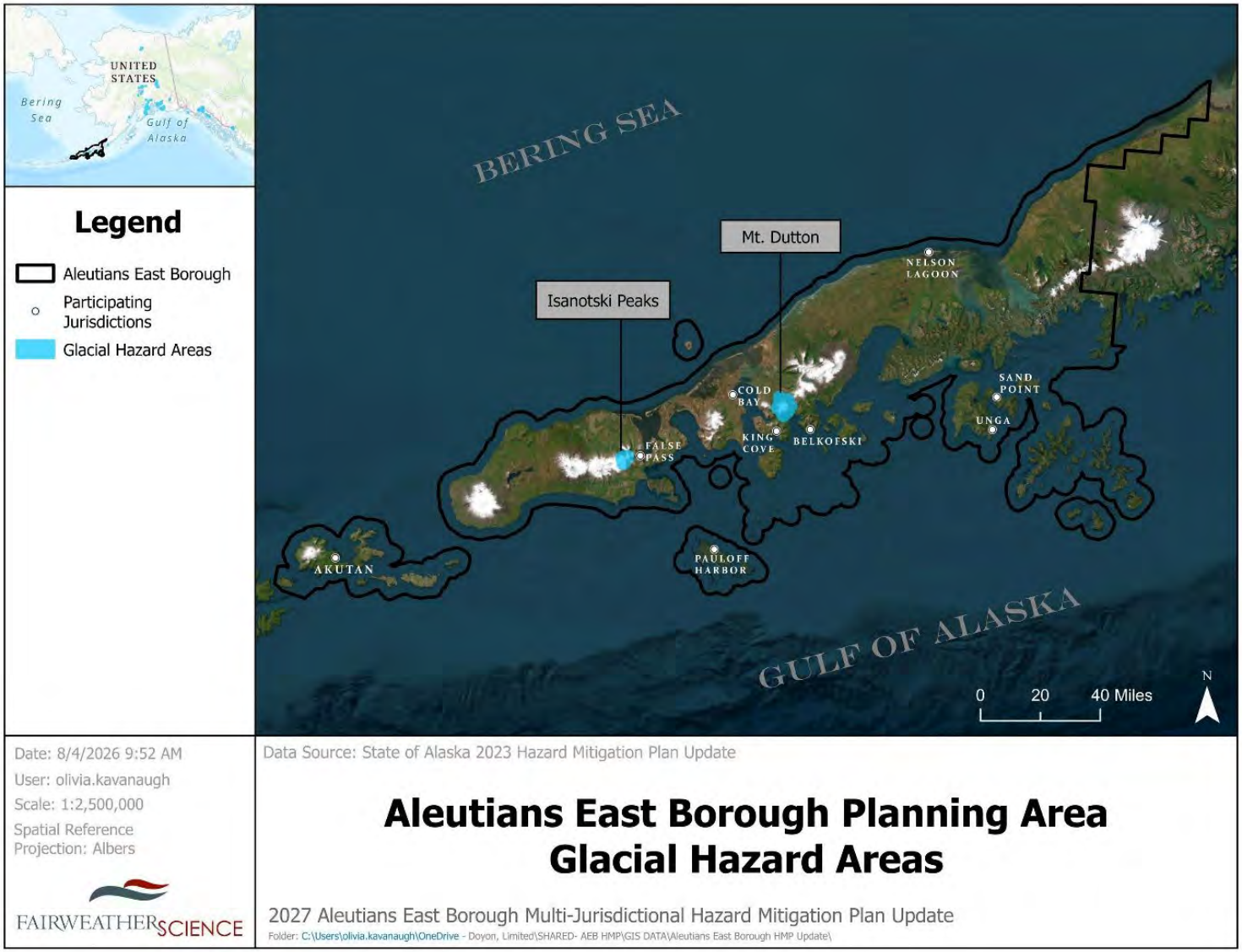



**Figure 2- AEB Planning Area Glacial Hazard Areas**

### 3.1.2 Vulnerability Assessment Methodology

A GIS-based analysis was conducted to assess the risks of each identified hazard for each participating jurisdiction. This analysis looked at the potential effects of each hazard on values of critical facilities at risk without considering the probability or level of damage. The analysis also represents the number of people at risk from each hazard but does not estimate the number of potential injuries or deaths.

The GIS-based vulnerability assessment represents one component of the overall vulnerability analysis conducted for this MJHMP Update. Quantitative exposure data were supplemented, where available, by Indigenous Knowledge, local knowledge and observations, historical accounts, jurisdiction-provided information, and other qualitative sources. These sources were used to identify or better understand vulnerabilities that may not be represented in available spatial datasets, including impacts to subsistence resources and access, traditional-use areas, transportation and supply systems, community infrastructure, and other locally important resources. Where Indigenous Knowledge or local knowledge informed the identification or characterization of a hazard, it is incorporated into the applicable hazard profile or jurisdictional annex.

| Hazard | | Vulnerability Assessment Methodology |
|---|---|---|
| Changes in the Cryosphere | Sea Ice | Sea ice is a multifaceted hazard that can cause direct damage through runup, as well as indirect impacts from transportation disruptions and increased exposure to sediment deterioration during severe storms.<br>Sea ice hazard areas in the Aleutians East Borough were identified by buffering the shoreline by 100 ft, with a focus on marine infrastructure. |
| | Snow Avalanche | The 2023 State of Alaska HMP did not identify avalanches hazard areas in the Aleutians East Borough. The State of Alaska recognizes avalanche hazard areas by slopes 28-60º within 10km from roads (State of Alaska 2023).<br>A comprehensive dataset of historical avalanche events (locations of past events) was not available for this analysis. LiDAR mapping is not available for any portions of the Aleutians East Borough. Jurisdictions provided anecdotal historical information on past event history and locations, where available.<br>Avalanche hazard areas in the Aleutians East Borough were identified in three methodologies:<br>• Historical landslide events (DGGS Alaska Landslide Inventory) were buffered by 1,000 feet (same as the methodology used for ground failure/ landslide hazard areas)<br>• Local knowledge/anecdotal information of historical hazard events and locations<br>• ArcGIS Pro basemaps (satellite imagery, topographic maps, and terrain) were used to identify mountainous areas, elevation, and visible slope characteristics. Potential avalanche hazard areas were manually delineated based on these features and, where available, photographs of the geography were used to confirm the presence of steep slopes.<br>This assessment is intended to identify potential areas of avalanche hazard at a planning level and is not a substitute for site-specific hazard mapping, geotechnical studies, or detailed evaluation of local topography and site conditions.<br>This methodology may over or underestimate avalanche hazard areas in the Aleutians East Borough. |
| Dam Failure | | Formal dam inundation mapping was not available for dams in the Aleutians East Borough. Dam failure hazard areas in the Aleutians East Borough were identified by buffering the 1-mile downstream route by 0.1 miles (528 feet). |

| Hazard | Vulnerability Assessment Methodology |
|---|---|
| | This methodology does not account for site-specific topography or hydrology and may over or underestimate dam failure hazard areas in the Aleutians East Borough. |
| Earthquake | Earthquake hazard areas (and perceived shaking intensities) were identified using the 2023 State of Alaska HMP GIS hazard layers. It is assumed that all identified critical facilities and residences (100%) in the Aleutians East Borough have the potential to be threatened by an earthquake. |
| Flood | Coastal flooding hazard areas were identified using the 2023 State of Alaska HMP methodology. The State of Alaska defined coastal flood hazard areas in the 2023 State HMP Update by buffering 0.5 miles along threatened community coastlines (State of Alaska 2023).<br>The State of Alaska did not identify Sand Point, Unga Village/Unga Island, Pauloff Harbor Village/Sanak Island, or Belkofski Village as threatened communities and these locations were not included in the State's risk analysis. As these jurisdictions selected flooding as a hazard, a 0.5-mile buffer was created along the coastlines of these locations to assess coastal flooding vulnerability.<br>Riverine flooding hazard areas were identified using the 2023 State of Alaska HMP GIS hazard layers. The State of Alaska recognizes riverine flood hazard areas by buffering 0.25 miles along threatened community embankments (State of Alaska 2023).<br>This methodology does not account for site-specific topography or elevation and may over or underestimate coastal and riverine flood hazard areas in the Aleutians East Borough. |
| Ground Failure/ Landslide | The 2023 State of Alaska HMP did not identify landslide hazard areas in the Aleutians East Borough. The State of Alaska recognizes landslide hazard areas by slopes greater than 28º (State of Alaska 2023).<br>Landslide hazard areas in the Aleutians East Borough were identified in three methodologies:<br>• Historical landslide events (DGGS Alaska Landslide Inventory) were buffered by 1,000 feet (same as the methodology used for avalanche hazard areas)<br>• Local knowledge/anecdotal information of historical hazard events and locations<br>• ArcGIS Pro basemaps (satellite imagery, topographic maps, and terrain) were used to identify mountainous areas, elevation, and visible slope characteristics. Potential landslide hazard areas were manually delineated based on these features and, where available, photographs of the geography were used to confirm the presence of steep slopes.<br>This assessment is intended to identify potential areas of landslide hazard at a planning level and is not a substitute for site-specific hazard mapping, geotechnical studies, or detailed evaluation of local topography and site conditions.<br>This methodology may over or underestimate landslide hazard areas in the Aleutians East Borough. |
| Invasive Species | The presence of invasive species (terrestrial plants, aquatic animals, and terrestrial animals) was determined through the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database as well as Local knowledge/anecdotal information of the presence and history of invasive species in the communities.<br>Invasive species are not anticipated to cause direct physical damage to infrastructure or residential structures. Potential impacts are expected to be |

| Hazard | Vulnerability Assessment Methodology |
|---|---|
| | indirect and may include degradation of ecosystems, reduced biodiversity, impacts to native species, increased maintenance requirements for vegetation management, and effects on land and water resources. |
| Sediment Deterioration and Land Destabilization | The 2023 State of Alaska HMP did not identify sediment deterioration and land destabilization hazard areas in the Aleutians East Borough. Community-specific sediment deterioration and land destabilization mapping and modelling was not available for the participating jurisdictions.<br>Sediment deterioration and land destabilization hazard areas in the Aleutians East Borough were identified by buffering the shoreline by 100 ft, as well as local knowledge/anecdotal information of sediment deterioration and land destabilization hazard events and locations in the communities.<br>This methodology may over or underestimate the extent and location of sediment deterioration and land destabilization hazard areas in the Aleutians East Borough. |
| Severe Weather | It is assumed that all identified critical facilities and residences (100%) in the Aleutians East Borough are threatened by severe weather. |
| Tsunami | Tsunami hazard areas were identified through available DGGS tsunami inundation mapping for the participating jurisdictions, where available. Formal tsunami inundation mapping was available for the geographies of Akutan, Cold Bay, False Pass, King Cove, Sand Point, and Nelson Lagoon.<br>The “worst-case” inundation line encompasses the maximum extent of flooding from all model simulations of all source scenarios and historical observations. This line and accompanying maximum flow depths were used to determine the extent of tsunami inundation in the Aleutians East Borough.<br>Formal tsunami inundation mapping was not available for the historical village lands of Belkofski Village, Pauloff Harbor Village/Sanak Island, and Unga Village/Unga Island. As the jurisdictional Planning Teams identified tsunami as a potential hazard impacting these geographies, potential tsunami hazard areas were identified by utilizing the methodology for coastal flood hazard areas- by buffering the shoreline by 0.5 miles.<br>This methodology does not account for site-specific topography or elevation and may over or underestimate tsunami hazard areas in Belkofski Village, Pauloff Harbor Village/Sanak Island, and Unga Village/Unga Island. |
| Volcano | Volcano (volcanic ash) hazard areas were identified using the 2023 State of Alaska HMP GIS hazard layers.<br>It is assumed that all identified critical facilities and residences (100%) in the Aleutians East Borough are threatened by volcanic ashfall. |
| Wildland Fire | The 2023 State of Alaska HMP did not have available wildland fire hazard areas or risk for the Aleutians East Borough.<br>The LANDFIRE (Landscape Fire and Resource Management Planning Tools Project) 2025 Update wildfire exposure data was used to assess wildfire exposure and relative risk for jurisdictions that selected wildfire as a hazard.<br>It is assumed that all identified critical facilities and residences (100%) in the jurisdictions that selected wildland fire as a hazard are threatened by wildfire. |

#### 3.1.2.1 Data Limitations

This Risk Assessment uses the best data that is currently available. These estimates may be used to understand relative risk from hazards and potential losses. However, uncertainties are inevitable in any loss estimation. This is due in part from incomplete scientific knowledge or data concerning hazards and their effects on the built environment. As well as the use of approximations and simplifications, when necessary, for a comprehensive analysis.

The results of the quantitative vulnerability assessment are limited primarily to the exposure of people, buildings, and critical facilities and infrastructure to identified hazards. These quantitative results should therefore be interpreted as one component of the overall assessment of vulnerability, rather than a complete representation of community risk. Available spatial and loss-estimation data do not fully capture all values that may be affected by hazards, including subsistence resources and access, traditional-use areas, cultural resources, community relationships with land and water, local transportation and supply dependencies, and other resources identified as important by participating jurisdictions.

To help address these limitations, the planning process incorporated available Indigenous Knowledge, local knowledge and observations, historical information, and jurisdiction-provided data alongside scientific, technical, and spatial information. These qualitative sources provide additional context regarding how hazards have affected communities, how environmental conditions have changed or been observed over time, and where vulnerabilities may exist that are not represented in available datasets. Where information could not be sufficiently validated or was too sensitive for inclusion in a public document, it was not used to make unsupported quantitative claims or disclose sensitive information.

It was beyond the scope of this MJHMP Update to develop quantitative estimates for all dimensions of vulnerability. A more comprehensive quantitative assessment could include loss of facility or system function, annualized losses, injuries or fatalities, shelter requirements, economic losses, and other measurable consequences. Qualitative information presented throughout the Risk Assessment and jurisdictional annexes supplements, but does not replace, the quantitative exposure analysis.

Mitigation actions to close data gaps such as continued studies to evaluate hazards completely have been recommended as mitigation projects. Such impacts may be addressed with future updates of this MJHMP Update or other planning documents. See jurisdictional Mitigation Action Plans for specific mitigation actions proposed to address data gaps regarding hazard risks.

## 3.2 Hazard Profiles

***The hazards profiled in this HMP Update are presented in alphabetical order. The presentation order does not signify their importance or risk level.***

### 3.2.1 Changes in Cryosphere- Sea Ice

The "cryosphere" is defined as those portions of Earth's surface and subsurface where water is in solid form, including sea, lake, and river ice, snow cover, glaciers, ice caps and ice sheets, and frozen ground (e.g., permafrost) (Figure 3). The components of the cryosphere play an important role in regulating the climate. Snow and ice reflect heat from the sun, helping to regulate the Earth's temperature. They also hold Earth's important water resources, and therefore, regulate sea levels and water availability in the spring and summer. The cryosphere is one of the first places where scientists can identify future global climate conditions.

According to the 2023 State of Alaska Hazard Mitigation Plan, hazards of the cryosphere can be subdivided into four major groups:

- Glaciers
- Permafrost and periglacial
- Sea ice
- Snow avalanche

***Of these four major groups, sea ice and snow avalanches impact some of the communities of the Aleutians East Borough.***

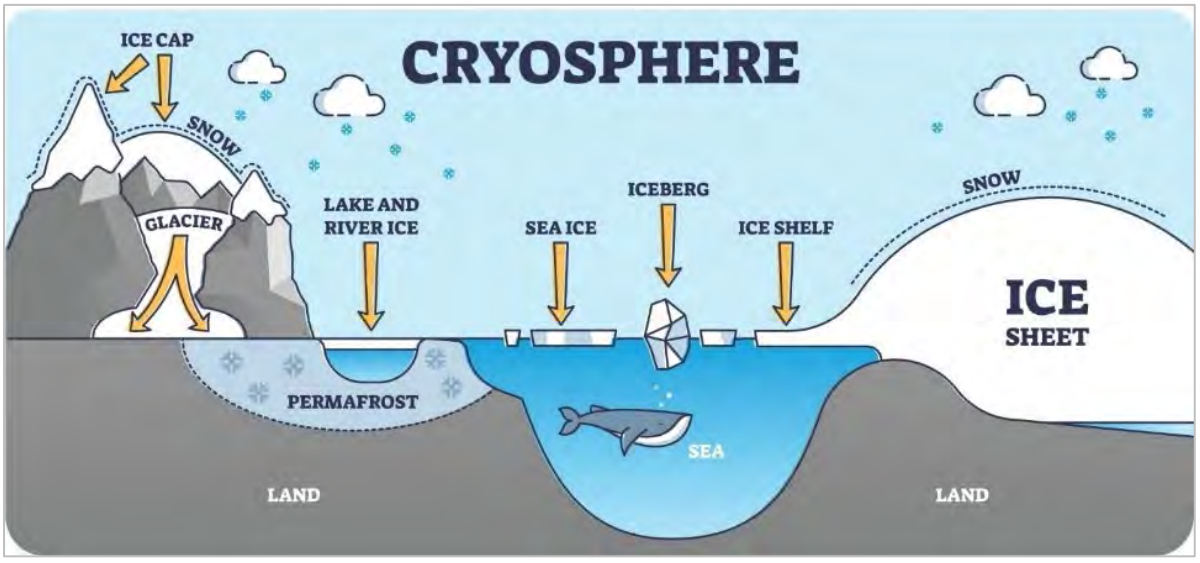



**Figure 3- Components of the Cryosphere**

The remainder of this section will focus on regional information related to sea ice and snow avalanches. Jurisdiction-specific hazard details can be found in **Volume 2. Jurisdictional Annexes**.

#### 3.2.1.1 Nature

Sea ice is frozen ocean water that forms, grows, and melts in the ocean. Sea ice grows during the winter and melts during the summer. Sea ice and its associated hazards are complex and dynamic. This is due to the interaction of multiple factors, such as wind, temperature, first-year ice, multi-year ice, coastal land destabilization and sediment deterioration, and human activities.

Unlike many other natural hazards, both the presence and absence of sea ice can cause serious challenges. Sea ice acts as a natural buffer for coastal Alaska communities by absorbing wave energy,

reducing storm surge, and protecting shorelines from land destabilization and sediment deterioration, particularly during significant storm events. When sea ice is present, it limits the formation of large waves and prevents powerful winter storms from directly impacting coastal infrastructure. Loss of sea ice is an environmental change that indirectly increases risk from severe storms, coastal flooding, land destabilization and sediment deterioration.

The presence of sea ice can block channels that are normally navigable, causing serious transportation challenges.

There are many types of sea ice, some of which are:

- **Drifting ice (iceberg)** - Ice that has broken free of its source and floats in an ocean or lake. Icebergs range in size from ice-cube-sized chunks to ice islands up to 4,250 square miles. Icebergs pose a danger to ships traversing ocean waters.
- **Grounded floeberg** - A massive piece of sea ice composed of **grounded pressure ridges** or hummocks that has separated from an ice pack and become lodged in shallow water.
- **Ice push (ivu)** - A surge of ice from an ocean or large lake onto the shore. These are caused by currents, strong winds, or temperature differences that push ice onto the shore, creating immense ice piles that can be shoved inland.
- **Landfast ice** - Also called shorefast ice, this is a type of sea ice that primarily forms off the coast in shallow water. This is the ice that humans have the most contact with, as it is used for transportation and subsistence activities in the Arctic. A landfast ice breakout occurs when grounded pressure ridges that anchor sea ice to the shallow ocean bottom fail or unground, and previously stationary ice detaches from the coast and drifts away to form a floeberg.
- **Slush ice** - A mixture of snow and ice crystals floating on the surface of the ocean. The ice crystals, called frazil, represent the first stages of sea ice growth. Slush ice can build up on vessels and equipment and clog intake valves.
- **Pack ice** – Any area of sea ice that is not landfast; it is not attached to the shoreline and is therefore mobile. Pack ice floating, drifting, and constantly moving due to wind and currents.




Source: A.R. Mahoney 2018

**Figure 4- Landfast Sea Ice and Pack Ice**

The flaw lead depicted above refers to open water that can be present at the seaward edge of landfast ice.

### 3.2.1.2 Location

In the Aleutian Islands, even though sea ice is less common than further north in Alaska, seasonal ice in the Bering Sea still plays an important role. When present, it dampens wave activity and protects the shoreline during strong North Pacific storms. Without sea ice, Aleutian Island communities face more coastal land destabilization and sediment deterioration, higher storm-driven flooding, and increased risk to ports, roads, runways, and buildings that sit close to the shoreline.

***Affected locations include exposed coastlines around Cold Bay, False Pass, and Nelson Lagoon. North-facing coasts along the Bering Sea are especially impacted.***

Sea ice dynamics outside of the Aleutians East Borough Planning Area may still have a downstream impact on Planning Area communities due to increased wave fetch during severe storms rolling in off the Bering Sea.

### 3.2.1.3 History

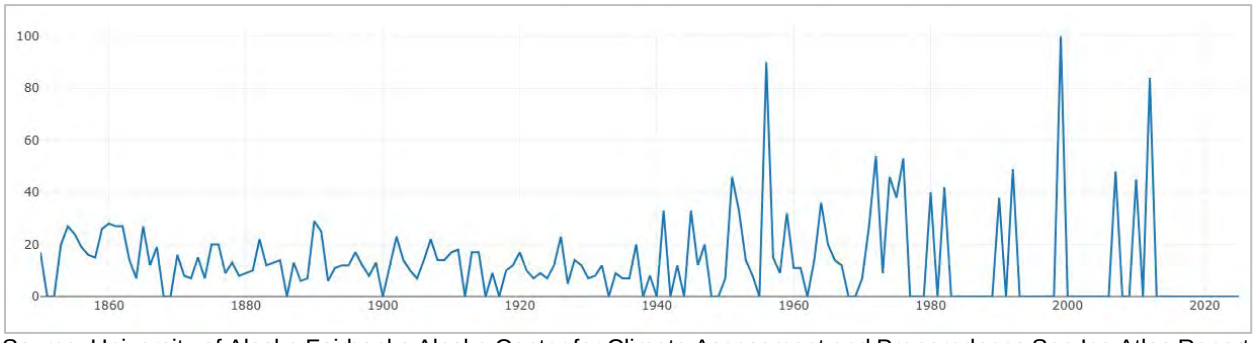
Through much of the 20th century, Bering Sea winter ice regularly expanded south in the Bering Sea, even occasionally reaching the Pribilof Islands. Starting in the 2000s, significant declines in winter sea ice extent occurred.

From 2017 to 2019, exceptionally low ice winters across the Bering Sea resulted in extreme open-water conditions, producing higher wave activity, coastal land destabilization and sediment deterioration, and disruption to marine ecosystems.

***In 2025, the University of Alaska Fairbanks Alaska Center for Climate Assessment and Preparedness published a historical sea ice atlas for Alaska and the Arctic spanning the years 1850 to December 2025. Of the Aleutians East Borough Planning Area communities, only Nelson Lagoon is included in the atlas* (UAF ACCAP 2026).**

Generally, ice begins to form in the northern Bering Sea in October and November, reaching its maximum extent in February or March. This is variable from year to year.

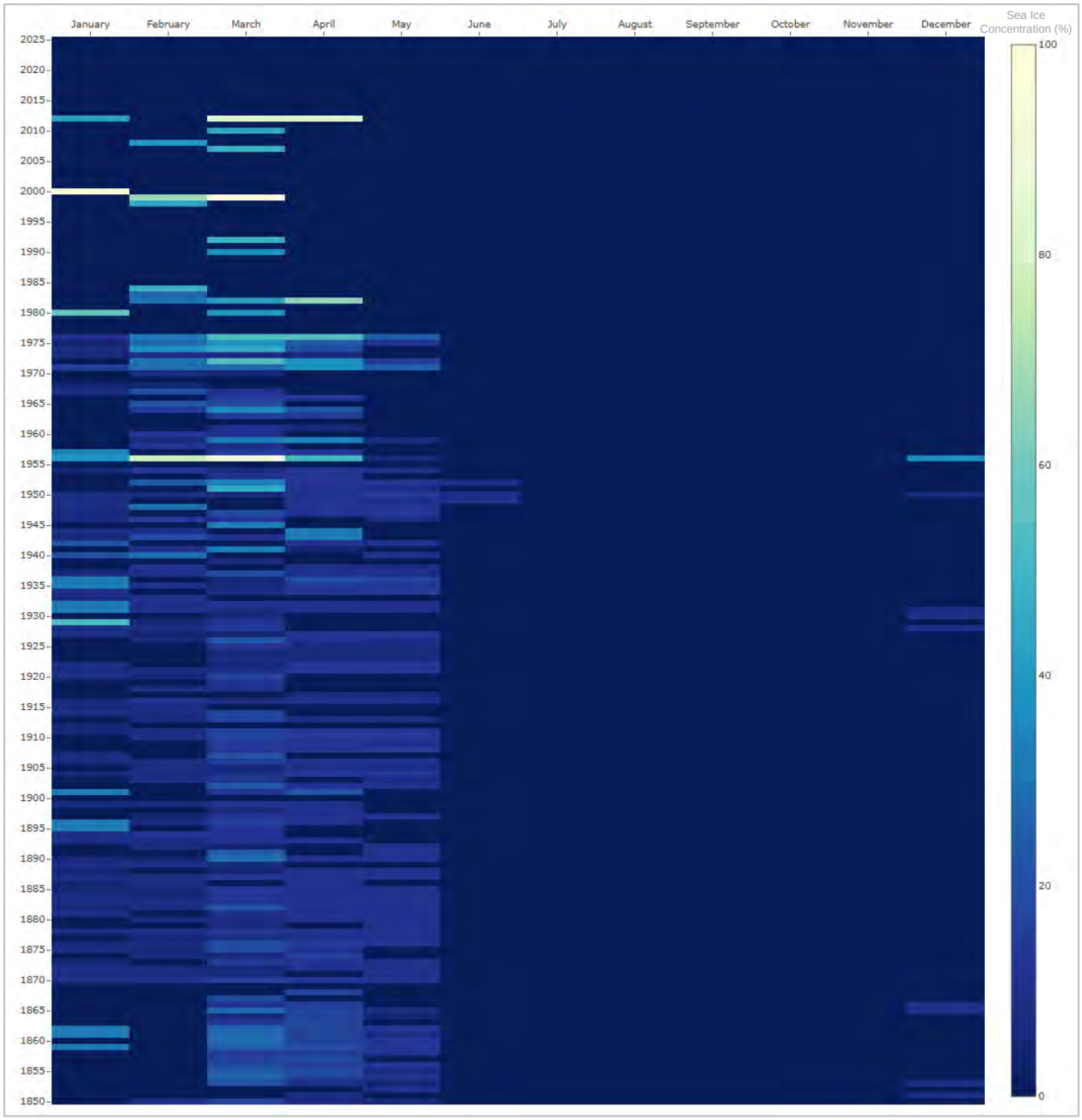
Figure 5 shows sea ice concentration for the month of March from 1850 to 2025. According to this data, sea ice was present in concentrations below 60% somewhat consistently from 1850 to 1980. More variation, with low to no ice years and high ice years, were observed from 2000 to 2020.




Source: University of Alaska Fairbanks Alaska Center for Climate Assessment and Preparedness Sea Ice Atlas Report

**Figure 5- March Sea Ice Concentration in Nelson Lagoon, 1850-2025**

Figure 6 also shows sea ice concentration in Nelson Lagoon but uses color instead of lines and shows every month for every year. This figure affirms the trends described above, where much of the 20th century saw some winter ice across the months of January through April. Later in the 20th century and into the 2000s, sea ice concentration variability increased, with years of no or very little sea ice concentration, punctuated by years of higher sea ice concentration.




Source: University of Alaska Fairbanks Alaska Center for Climate Assessment and Preparedness Sea Ice Atlas Report

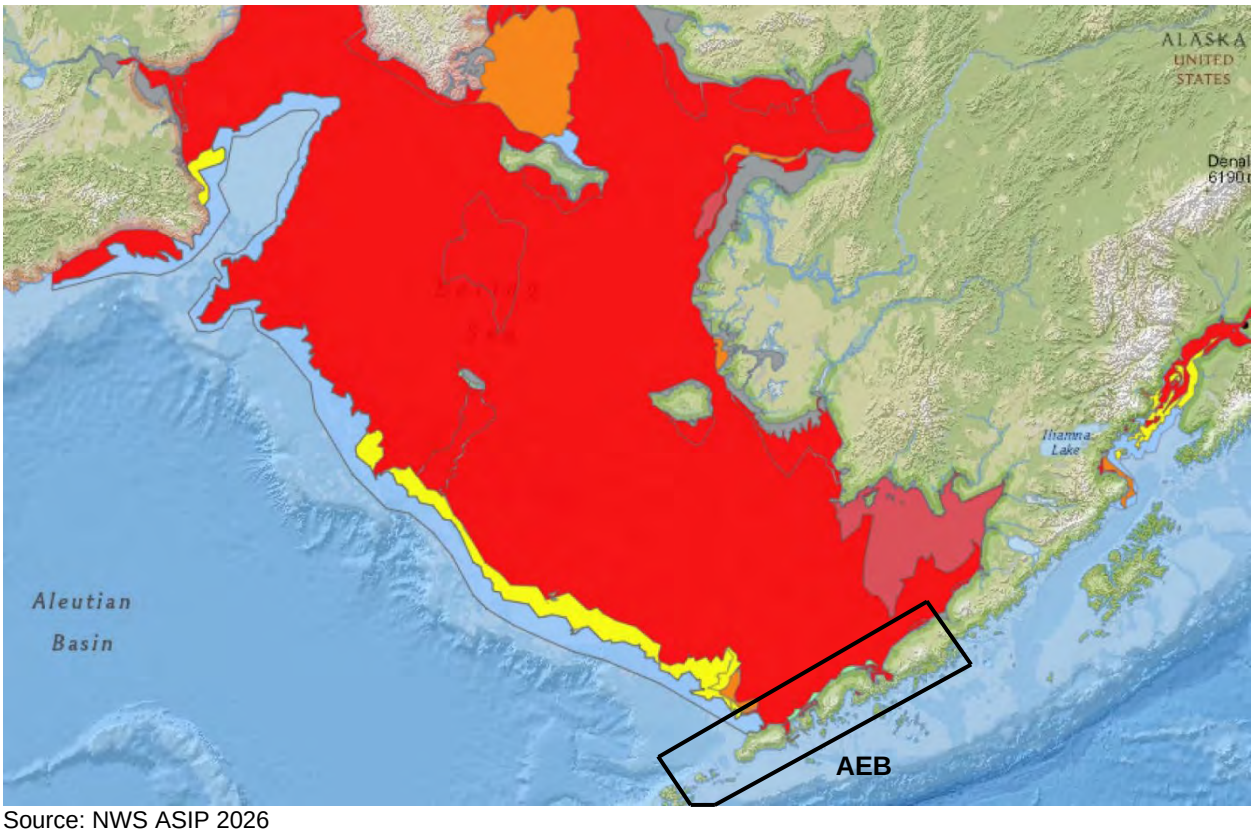
**Figure 6- Sea Ice Concentration, Nelson Lagoon, 1850-2025**

Information about historical events involving the presence of sea ice is limited. In 2026, Cold Bay reported an event in which sea ice, which is not common in the community, was in the Bay. It blocked freight ships which were trying to bring supplies to the community.

#### 3.2.1.4 Extent (Magnitude and Severity)

Generally, sea ice forms further north in the Bering Sea. However, Planning Area communities do experience sea ice on and near their shorelines, especially Nelson Lagoon. In 2026, Bering Sea ice extended as far as the Pribilof Islands and past Nelson Lagoon, Cold Bay, and Unimak Island. False Pass has reported that sea ice prevented vessel traffic. The Native Village of Unga Planning Team reported that the Bay freezes over occasionally. See jurisdictional annexes for additional, jurisdiction-specific information.

According to the National Weather Service's Alaska Sea Ice Program, the ice was about 10 inches thick, which is thin compared to previous decades (NWS ASIP 2026). Figure 7 shows sea ice extent in the Bering Sea on March 31st, 2026. The areas in red are where 90 to 100% of the water surface is covered by ice. Areas in yellow are 40 to 60% covered in ice. The westernmost extent of the red area includes part of Unimak Island, where False Pass is located.




Source: NWS ASIP 2026

**Figure 7- Sea Ice Extent in the Bering Sea on March 31st, 2026**

***Observational data from UAF's sea ice research programs show that overall winter ice extent in the Bering Sea has decreased over the past two decades.*** However, year-to-year variability remains substantial. This was seen in the winter of 2026, when persistent cold air temperatures and favorable atmospheric circulation supported higher than average Bering Sea ice coverage.

***Without sea ice offering a buffer from winter storms in the Bering Sea, communities can experience greater surges and wave heights. The impact of sea ice loss on the magnitude and severity of these winter storms has not been specifically studied for Planning Area communities.***

A 2011 Hazard Impact Assessment for Nelson Lagoon includes a wave analysis both in the Bering Sea and in Nelson Lagoon. This analysis concludes that the 10-year return period for significant wave heights is approximately 33 feet (meaning a wave of this height can be expected on average once every 10 years). The 100-year return period is 44 feet.

**Table 6- Extreme Wave Height Based on Return Period in the Bering Sea**

| Return Period | Water Level, ft (MLLW) | Approximate $H_{mo}$ (ft) | Approximate Tp (sec) |
|---|---|---|---|
| 10 Year | 10.5 | 4.2 | 3.7 |
| | 9.7 | 4.0 | 3.7 |
| | 5.9 | 3.0 | 3.4 |

| Return Period | Water Level, ft (MLLW) | Approximate $H_{mo}$ (ft) | Approximate Tp (sec) |
|---|---|---|---|
| | 2.2 | 1.5 | 2.9 |
| 100 Year | 10.5 | 5.1 | 4.1 |
| | 9.7 | 4.9 | 4.0 |
| | 5.9 | 3.5 | 3.8 |
| | 2.2 | 1.7 | 3.2 |

Source: Nelson Lagoon Hazard Impact Assessment, 2011

Based on past event history and the criteria identified in Table 4, the magnitude and severity of sea ice hazards and resultant damages to people and infrastructure in the Aleutians East Borough Planning Area are considered **Limited**, with injuries and/or illnesses that do not result in permanent disability; complete shutdown of critical facilities for more than one week; and more than 10% of critical facilities being severely damaged.

#### 3.2.1.5 Impact

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | Changes in regional sea ice in the Bering Sea have significant indirect impacts on Planning Area communities, primarily by altering ocean behavior, coastal hazard exposure, and marine ecosystems. Even though sea ice does not typically occur along the Aleutians, the loss of seasonal Bering Sea ice north of the Borough has increased the length of the open-water season, allowing stronger storm systems and higher wave energy to reach the Alaska Peninsula (UAF IARC, 2023; NOAA Sea Ice Program, 2024). These changes amplify existing hazards, including coastal land destabilization and sediment deterioration and storm-related flooding, particularly for communities with exposed Bering Sea-facing shores such as Nelson Lagoon. |
| Infrastructure | The absence of winter ice reduces the natural buffering effect that historically limited winter wave fetch across the northern Pacific and Bering Sea. As a result, harbors, docks, seafood processing infrastructure, fuel storage sites, and waterfront utilities experience more frequent surge events during winter storms (State of Alaska DHS&EM 2023).<br><br>Wind-driven ice can also pile up against shorelines, increasing the force on harbor structures and elevating water against the coast during strong storms. Combined with storm surge or high waves, sea ice can add force to runup and increase the risk of damage to roads, docks, and facilities along the shoreline.<br><br>The presence of sea ice can increase the risk of runup, potentially damaging infrastructure along the shoreline. |
| People | Changes in regional sea ice can present direct risk of personal injury and death, although none have been reported in the AEB Planning Area. Indirect impacts to people include travel disruptions, utility damages impacting daily life, and disruptions to economic and subsistence activities. |
| Utilities | The absence of winter ice reduces the natural buffering effect that historically limited winter wave fetch across the northern Pacific and Bering Sea. As a result, harbors, docks, seafood processing infrastructure, fuel storage sites, and waterfront utilities experience more frequent surge events during winter storms (State of Alaska DHS&EM 2023). |

| | Description of Previous/Potential Impacts |
|---|---|
| Transportation | The presence of sea ice can also have serious impacts. Sea ice hazards can disrupt freight movement and damage marine and coastal infrastructure. When ice packs form or drift into nearshore areas, vessels delivering fuel and supplies can be blocked from safely reaching docks. This leads to delays or forced reroutes.<br>Rapid changes in sea ice during storm conditions can contribute to difficult travel and search-and-rescue operations (ANTHC 2024). |
| Economy | Impacts extend to public safety, local economies, and subsistence activities. With increasing winter open-water conditions, marine travel can become more hazardous. This can impact both subsistence harvesters and commercial fishing operations (ANTHC 2024).<br>The region's economy is closely tied to fisheries and shifts in ocean temperatures and ice-driven ecosystem changes have affected the distribution of key commercial species such as cod, crab, and salmon. These ecological shifts have influenced catch variability and contributed to economic uncertainty for processors and fishing families (UAF SNAP, 2024; NOAA 2023b). |
| Subsistence Resources | Impacts extend to public safety, local economies, and subsistence activities. With increasing winter open-water conditions, marine travel can become more hazardous. This can impact both subsistence harvesters and commercial fishing operations (ANTHC 2024).<br>Changes in sea ice contribute to altered marine mammal distributions, which can influence local subsistence harvest opportunities. Reduced predictability of weather and marine conditions increases risk during travel and may disrupt traditional timing of harvest activities.<br>Local knowledge provided through the planning process also identified reduced or unpredictable sea ice, together with rough seas, high winds, and storm surge, as conditions that can shorten harvesting windows and make boat travel and shoreline access unsafe. These observations demonstrate that sea ice-related vulnerability may be experienced not only through direct physical exposure to ice, but also through changes in access to subsistence resources and the conditions under which harvesting occurs. |

#### 3.2.1.6 Probability of Future Events

Based on local observations, data from UAF and NOAA, and the criteria identified in Table 5, it is **Possible** that the Aleutians East Borough Planning Area will experience impacts associated with regional sea ice loss in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Future conditions will be shaped by both long-term decline and short-term variability in the Bering Sea ice pack. Each jurisdiction has its own unique location and geographic factors that affect its resilience to changes in sea ice.

#### 3.2.1.7 Future Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of sea ice hazards in Alaska. |
| Location | Future climate conditions are likely to influence the location of sea ice changes and associated hazards in Alaska by shifting the typical location of sea-ice loss northward and earlier in the season, resulting in longer periods of open water across the Bering Sea |

| Description of Future Conditions | |
|---|---|
| | and reducing the likelihood that protective ice will form or persist near the Aleutians East Borough Planning Area. |
| Extent | Future climate conditions are likely to influence the extent of sea ice. The winter Bering Sea Ice cover continues to retreat as a long-term trend with year-to-year variability (State of Alaska DHS&EM 2023). |
| Impact | During the last several decades, Alaska has warmed twice as fast as the rest of the U.S. Sea ice and climate are intimately linked. An ice bench reduces wave development in the open ocean during winter months. Without an ice bench, waves can mechanically erode coastal beaches. Many villages are located along Alaska's coastline and are threatened by eroding shores.<br><br>Retreat of sea ice is anticipated to disrupt marine ecosystem, impact local communities where sea ice is important for subsistence or tourism, and contribute to increased storm surge, coastal flooding, and sediment deterioration and land destabilization (City of Cold Bay LHMP 2022). The presence of sea ice, which may continue to be highly variable from year to year despite a long-term downward trend, may cause delays to freight and damage to marine and coastal infrastructure. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of sea ice cover-related events, especially severe storms, in the Aleutians East Borough Planning Area. Due to the loss of winter sea ice and other factors including increased temperatures and precipitation, Alaska as a whole is projected to see a threefold increase in severe storms (State of Alaska DHS&EM, 2023). |
| Population Patterns | Future climate conditions may influence population patterns as they relate to sea ice hazards, as increased frequency and adverse impacts from severe storms could lead people to relocate from vulnerable coastal areas, or from the community entirely. |
| Land Use Development | Future climate conditions may influence land use development as it relates to sea ice hazards, as an increase in severe storms without sea ice protection could lead to changes in the location of certain land use development activities - such as areas slated for marine infrastructure, residential construction or waste management - that are vulnerable to these severe storms. |
| Subsistence Resources | Future climate conditions are expected to influence subsistence resources as they relate to sea ice hazards. Low winter sea ice extents, which have been seen in the Bering Sea in the last decade, affect the marine ecosystem that supports subsistence resources that are critical to Planning Area communities' ways of life. Some species are expected to shift northward, such as Pacific Cod. Migration patterns and timing for species including salmon, marine mammals, and subsistence waterfowl are also observed and expected in the future. |

## 3.2.2 Changes in the Cryosphere- Snow Avalanche

### 3.2.2.1 Nature

A snow avalanche is a mass of snow, ice, and debris that releases and slides or flows rapidly down a steep slope, either over a wide area or concentrated in an avalanche chute or track. Avalanches reach speeds of up to 200 mph and can exert forces great enough to destroy structures and uproot or snap large trees. Snow avalanches commonly occur in the mountains of Alaska during the winter and spring as the result of heavy snow accumulations on steep slopes. Avalanches typically release on slopes between 30 and 50 degrees (AAIC 2026). At this angle, snow can accumulate enough to build a slab and also remain in place without sluffing off due to gravity.

Large avalanches have the potential to kill people and wildlife, destroy infrastructure, level forests, and bury entire communities. An avalanche releases when gravity-induced shear stress on or within the snowpack becomes larger than its shear strength. Triggers can be natural (such as warming temperatures) or artificial (such as human weight). Significant avalanche cycles (multiple avalanches naturally releasing across an entire region) are generally caused by long periods of heavy snow, but avalanche cycles can also be triggered by rain-on-snow events, rapid warming in the spring, earthquakes, and wind.

There are five distinct avalanche types in Alaska that occur under varying snowpack and weather conditions (Alaska DHS&EM 2023). Each avalanche type is named based on its snow release characteristics.

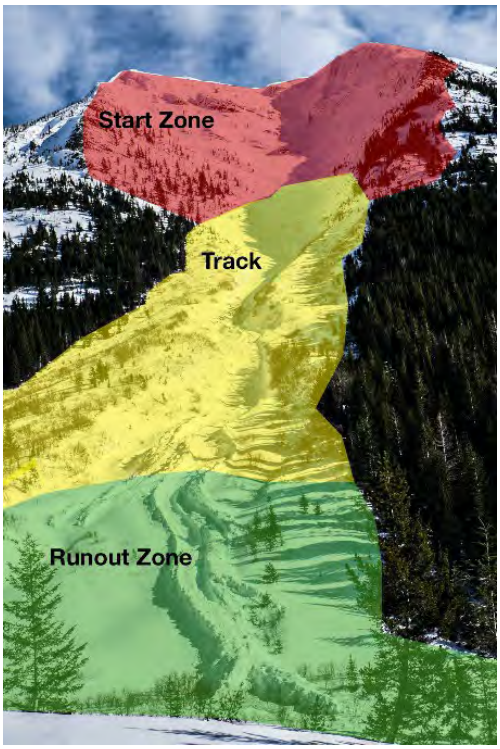
- **Cornice Collapse** occurs when an overhanging snow mass breaks, separates, or is released. Cornices form on ridge crests or shoulders adjacent to gullies due to wind blowing the snow. The cornice is an indicator of predominant wind directions, as the cornice is formed on the lee (i.e., downwind) side of topographic features. Over time, the cornice can develop weaknesses in its structure and its attachment to the slope may fail. A cornice collapse often triggers a loose snow or slab avalanche as it adds sudden and significant stress onto the snowpack below.
- **Loose Snow/Unconsolidated Avalanches**, also known as point releases, initiate with a small amount of non- cohesive (loose) snow and quickly grow larger as they move downhill and entrain more snow. This type of avalanche typically carries relatively small amounts of powder snow and virtually no other debris. However, a loose snow avalanche may trigger a larger slab avalanche on the same slope.
- A **Slab Avalanche** releases as a block of cohesive snow when snow particles have stuck together to form one or more resistant layers. There is a wide range of slab characteristics possible, varying from “soft” slab (weakly cohesive snow) to “hard” slab (very cohesive snow), and from “storm” slab (release of recently deposited storm snow), to “persistent” and “deep persistent” slab (release of a slab that failed on a weak layer deeper down in the snowpack). Due to their large release masses, and because more snow is picked up along the way (snow entrainment), slab avalanches are the most destructive avalanche type. Human encounters with even small-sized slab avalanches are often fatal.
- **Slush Avalanches** are fast-moving mixtures of snow and water. They release in isothermal snowpacks (snow temperature throughout the snowpack is 32°F) when liquid water permeates the snowpack and dramatically weakens the intergranular bond. Slush avalanches, therefore, typically occur in northern Alaska during the spring when warm temperatures and strong solar radiation quickly warm up the snowpack. Slush avalanches can release on slopes as moderate as 20 degrees. Their release is often slower than other avalanche types, but as the slushy snow runs downhill, they can reach speeds over 40 mph. Smaller, more fluid avalanches with higher water content are commonly referred to as slush flows.
- **Glide Avalanches** are defined as the release of the entire snow cover because of gliding over the ground. Glide avalanches can be composed of wet, moist, or almost entirely dry snow. They typically occur in very specific paths, where the slope is steep enough and the ground surface is relatively smooth. They are often proceeded by full depth cracks (glide cracks), though the time between the appearance of a crack and an avalanche can vary between seconds and months. Glide avalanches are unlikely to be triggered by a person, are nearly impossible to forecast, and thus pose a hazard that is extremely difficult to manage.

An avalanche path has three parts: the starting zone, track, and run-out zone. Local terrain shapes each section. Avalanches may follow steep gullies that hold streams in summer or flow across open slopes.

The **starting zone** (depicted in red in the image to the right) is the upper section where snow accumulates and the avalanche initiates. These zones often form in drainage headwaters on lee slopes. On open terrain they are harder to identify, and several starting zones may merge into one track.

The **track** (in yellow) is the middle section where the avalanche accelerates, reaches peak velocity, and may pick up additional snow. Tracks can be confined gullies or wide-open slopes and may branch into adjacent terrain.

The **run-out zone** (in green) is where the avalanche slows and deposits debris. Its impact pressure—driven by snow density, volume, and speed—helps determine potential damage and guides the design of protective measures.

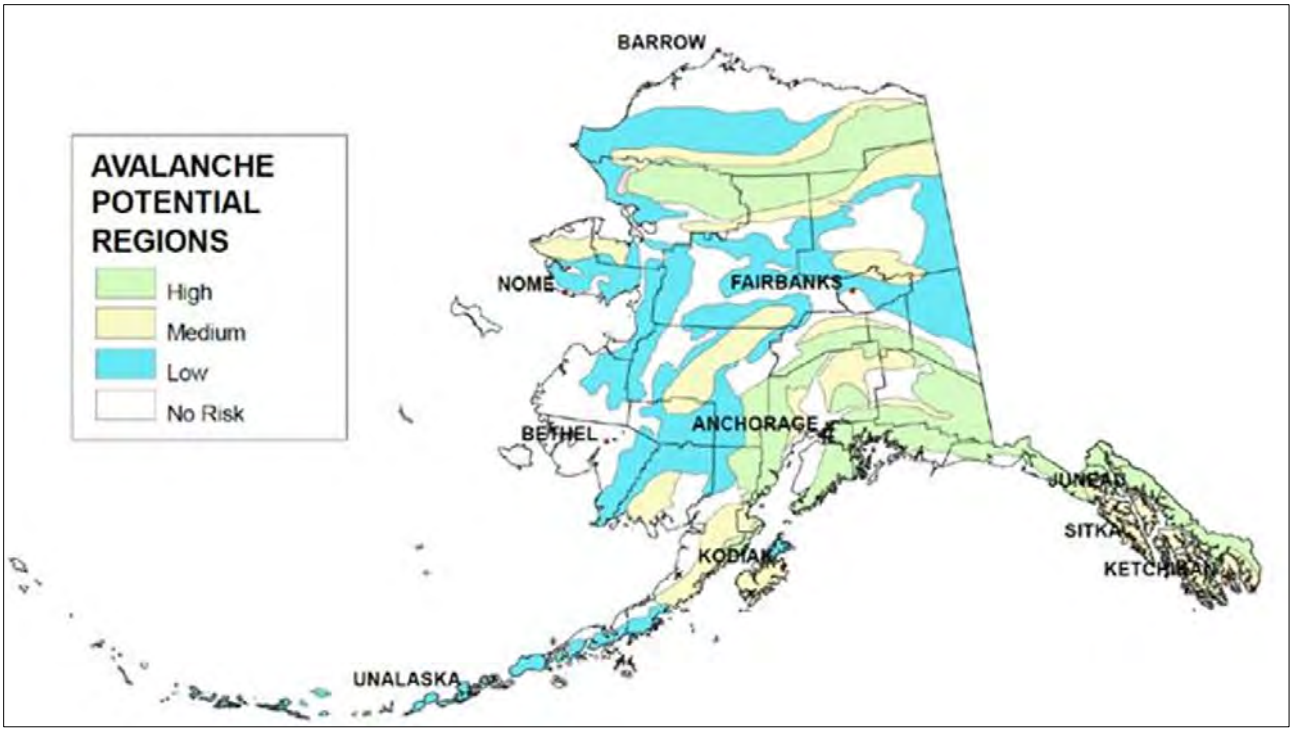



Source: Avalanche Canada 2026

**Figure 8- Depiction of an Avalanche Path**

### 3.2.2.2 Location

Snow avalanches mainly occur in mountainous regions on isolated steep slopes that lack forest-type vegetation. The 2023 State of Alaska HMP identifies statewide avalanche hazard areas, which are shown below.




Source: Hackett and Santeford 1980

**Figure 9- Alaska's Potential Snow-Avalanche Areas**

Avalanche forecasting and hazard mapping only cover a small portion of the state, concentrated around major population centers in Southcentral and Southeast Alaska. While the Aleutian Islands experience extreme winter weather with heavy snow and strong winds that create dangerous slabs, the region does not have regular public avalanche forecasts, active field monitoring, or formal hazard maps. No organizations operate a regional avalanche hub in the Aleutians, including the Alaska Avalanche Information Center. Because there are no major highways connecting towns or villages through steep mountain passes, the Alaska Department of Transportation does not deploy mitigation or forecasting infrastructure to the region.

The 2023 State of Alaska HMP did not identify avalanches hazard areas in the Aleutians East Borough. The State of Alaska recognizes avalanche hazard areas by slopes 28-60º within 10km from roads (State of Alaska 2023).

***A comprehensive dataset of historical avalanche events (locations of past events) was not available for the Aleutians East Borough. Jurisdictions provided anecdotal historical information on past event history and locations, where available.***

#### 3.2.2.3 History

There is very little documented information about snow avalanches and their impacts for the Aleutians East Borough and its communities.

Akutan: An avalanche was documented in Akutan on March 20, 2012. It hit multiple houses. No injuries were reported (LEO Network 2012).

King Cove: February 1, 2012- An avalanche occurred and pummeled into the Alaska Commercial (AC) store. An article from the Bristol Bay Times by Hannah Heimbuch, dated March 9, 2012, described this impact on the community:

> *AC Store Manager, Jeff Watt, said he and several other employees typically would have been there at the time-around 7:50 p.m. on February 1-but weather had prompted him to send everyone home early just 20 minutes before. When the crew arrived early the next morning, they noticed a few inches of water on the sales floor, leaking from broken pipes. The scene in the warehouse was more severe, with a snow slide taking up a large part of the room, 12 to 14 feet at its deepest level. The store stocks large appliances like washers, dryers and refrigerators, and of the 12 units stored in the warehouse, only two survived intact. 'It tossed one about 30 feet before it ran into something else,' Watt said. With such a heavy appliance getting tossed around like a basketball, Watt and his employees were fortunate to be on their way home when the snow hit. It took several bobcats and 20 people several days to get the snow cleared from the warehouse and clearing damaged merchandise and taking inventory took employees another two weeks.*
>
> *This has been a particularly undecided winter on the peninsula and in King Cove, with seriously fluctuating temperatures and high snowfall, which makes for an unstable snow pack. This was one of several avalanches that occurred over the span of a few days-albeit one of the most destructive seen in years. 'They've had a couple of avalanches at this store before,' Watt said, 'But it's opened the door a couple of feet. (This) probably came into my building a couple of hundred feet (Medred, C. 2012).*

An *Anchorage Daily Times* article of 1960 describes an event in which a dwelling in King Cove was flattened by strong winds during a snow storm at approximately 10 p.m. on January 19, 1960. Five young children and one adult died during this event. In the article, their deaths are attributed to exposure while pinned under the wreckage of their home, which was blown over by winds of about 60 knots. The temperature was reported to be 18 degrees F at the time. While the news report cites wind as the cause of the damage, people in King Cove report that it was a mud and rock avalanche on Ram's Creek Road which continued past the house and reached the bay. More recently, there has been at least one snow avalanche there.

During the 2026 planning process, a King Cove respondent reported that elders had described a snow avalanche coming down the hillside, striking a house, and carrying it to the beach. The respondent recalled that fatalities occurred but was uncertain whether the event took place in the 1950s or 1960s. This account is generally consistent with earlier local reports documented in the HMP, although it differs from the contemporaneous newspaper account regarding the cause of the event. Because the available

documentary and oral-history sources do not fully agree, both accounts are retained as part of the hazard history.

#### 3.2.2.4 Extent (Magnitude and Severity)

The geography, topography, and climate of much of the Aleutians East Borough lends itself to possible avalanche activity. The Aleutian Islands rise to volcanic mountainous areas up to 9,000 feet in elevation (USCG 2025). Lying in the maritime climate zone, this region receives an average annual snowfall of 52 inches (USCG 2025).

An avalanche can be incredibly destructive and have the potential to destroy everything in its path.

**Table 7- Avalanche Impact Pressures with Associated Damages**

| Impact | Impact Pressure | |
|---|---|---|
| | Pounds/Square Foot (psi) | Kilopascals (kPa) |
| Break Windows | 21 | 1 |
| Push in doors, damage walls, roofs | 62-125 | 3-6 |
| Severely damage wood frame | 209 | 10 |
| Destroy wood frame structures, break trees | 418-626 | 20-30 |
| Destroy mature forests | 1,044-2,090 | 50-100 |
| Uproot mature spruce | 2,090 | 100 |
| Move large boulders | 6,262 | 300 |
| Move reinforced concrete structures | 20,900 | 1,000 |

Source: Tetra Tech 2022

Historic events have indicated that avalanches up to 14 feet deep, and several hundred feet long are possible in the Aleutians East Borough Planning Area.

Based on past event history and the criteria identified in Table 4, the magnitude and severity of avalanches and resultant damages to people and infrastructure in the Aleutians East Borough Planning Area are considered **Limited**, with injuries and/or illnesses that do not result in permanent disability; complete shutdown of critical facilities for more than one week; and more than 10% of critical facilities being severely damaged.

#### 3.2.2.5 Impact

Large avalanche cycles are more common in Alaska during pronounced climate events driven by changes in the Pacific Ocean, such as during La Niña/El Niño and the larger-scale Pacific Decadal Oscillation, which cause warmer air temperatures and heavier precipitation than normal.

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | Avalanches can transport not only snow, but also trees, rocks, and other debris, permanently changing the character of hillsides and the areas beneath them. |
| Infrastructure | Avalanches can bury and/or destroy infrastructure and damage homes. |
| People | Large avalanches have the potential to kill people and wildlife. Avalanches result in human deaths every year and 18 people have died in avalanches in Alaska since 2020 (AAA 2026). None of these fatalities occurred in the Aleutian Islands.<br>**The only reported deaths from avalanches in the Aleutian Islands occurred in 1960 in King Cove.** In this incident, five children and one adult were killed after an avalanche hit their home. In a news article reporting this event, the |

| | Description of Previous/Potential Impacts |
|---|---|
| | deaths are attributed to exposure after a house was blown apart by high winds during a snowstorm. Local reports say that it was due to an avalanche. |
| Utilities | Avalanches can threaten fuel and supply storage areas, electricity infrastructure, and other utilities. |
| Transportation | Avalanches can block roads and interrupt access to harbors that are essential for transportation. Limited evacuation routes and the remote nature of many Aleutian communities, who are subject to weather-dependent air and water-based transit, increases the consequence of hazard events including avalanches. |
| Economy | The economic impacts of avalanches, from impeding traffic to removing avalanche debris blocking transportation corridors, can be significant at the local and state levels. |
| Subsistence Resources | Subsistence areas, equipment, and harvests can be damaged if they are in the path of a destructive avalanche. |

#### 3.2.2.6 Probability of Future Events

Due to changing future climate conditions, there is an expectation of an increase in Alaska's vulnerability to snow avalanche hazards (DGGS 2023d). Studies suggest that warming climate conditions increase avalanche risk due to changes in snow accumulation, moisture content, and loss of snowpack stability because of changing air temperatures. Ballesteros-Canovas et al. (2018) predict an increase in avalanche activity in the second half of the 21st Century, largely wet-snow avalanches due to increased air temperature and precipitation. However, as snow cover retreats upwards due to these same factors, the impacted area may also change to higher elevations (Ballesteros-Canovas et al. 2018).

It should be noted that snow avalanche hazards pose a threat to populated areas and infrastructure in some Aleutians East Borough communities, but not others. **Volume 2. Jurisdictional Annexes** describes jurisdiction-specific hazards and impacts.

Based on previous occurrences and the criteria identified in Table 5, it is **Possible** that areas in the Aleutians East Borough Planning Area will experience a snow avalanche event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### 3.2.2.7 Future Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of snow avalanche hazards in Alaska. |
| Location | It is possible future climate conditions will influence the location of snow avalanche hazards in Alaska. As warmer, wetter winters become more prevalent, heavy-snow avalanches may occur on different slopes that have not historically experienced avalanches. |
| Extent | Future climate conditions are likely to influence the magnitude and severity of avalanches. Avalanche activity is determined by several factors, including snowpack type, internal liquid volume, air temperature, precipitation, elevation, slope, ground cover, etc. An increase in liquid content within snowpack, from increased December-March air temperature and January-February increased precipitation, may lead to |

| Description of Future Conditions | |
|---|---|
| | greater occurrence of wet snow avalanches, especially in late winter/early spring (Ballesteros-Canovas et al. 2018). |
| Impact | Future climate conditions are likely to influence the impact of avalanches. As snowpack experiences greater liquid volume, avalanche risk will increase (Ballesteros-Canovas et al. 2018). As snowpack retreats to higher elevations due to reduced snowpack and quickened melt, the impacted area will also shift upwards. Impacts in this scenario will likely be due to loss of water supply, affecting culture, wildlife resources, and tourism (IPCC 2018). Infrastructure in avalanche hazard zones may also be impacted by an increase in frequency and extent of wet snow avalanches. Damage to structures may vary depending on the impact pressure of the avalanches. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of future avalanche events in the Aleutians East Borough Planning Area. Some studies suggest that a warming climate may increase avalanche risk due to changes in snow accumulation and moisture content, as well as loss of snowpack stability because of changing air temperature (DGGS 2023d). Ballesteros-Canovas et al. (2018) predicts an increase in avalanche activity in the 2nd half of the 21st century; largely wet-snow avalanches due to increased air temperature and precipitation. |
| Population Patterns | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in the Aleutians East Borough Planning Area. However, this is jurisdiction dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in construction moving outside of avalanche zones. Due to the cost and difficulty of building in the Aleutian Islands, it is possible that if a home is damaged by an avalanche that the residents may move out of the community completely. |
| Land Use Development | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in the Aleutians East Borough Planning Area. However, this is jurisdiction dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in land use which promotes development outside of possible avalanche slide paths. |
| Subsistence Resources | Future climate conditions are not anticipated to influence subsistence resources as they relate to avalanche hazards. |

### 3.2.3 Dam Failure

The Planning Team recognizes that a dam failure is not a natural hazard, but several of the hazards identified in this HMP could influence a dam failure in the Aleutians East Borough Planning Area. Additionally, updated FEMA guidelines require that for a jurisdiction to be eligible for FEMA's Rehabilitation of High Hazard Potential Dam (HHPD) Grant Program, they must address HHPDs in their Hazard Mitigation Plan.

There are 7 dams in the Aleutians East Borough Planning Area- three (3) dams are proposed to be classified as High Hazard Potential Dams by the State of Alaska Dam Engineer, and three (3) dams are classified as Significant Hazard Potential Dams (NID 2026, State of Alaska Dam Safety Engineer 2026).

Note: As of 2025, FEMA is only funding projects for the rehabilitation of HHPDs. The Planning Team chose to include information on all dams in Planning Area in this section to explore non-FEMA funding available for the rehabilitation of non-HHPDs and in preparation of a Significant Hazard dam being reclassified to a HHPD before the next HMP update cycle and will continue to work with the State of Alaska Dam Engineer to close data gaps to better evaluate risk associated with dams in the Planning Area.

Note: This hazard profile discusses dam failure, for information on coastal flooding, see Section 3.2.5.

**Alaska Dam Safety Program**

Table 4 lists the documents that were used in the development of this MJHMP update, including those used for the HHPD Section. Dam safety information including inspection reports were provided by the jurisdiction, dam owner, or the Alaska Dam Safety Office.

The State Dam Safety Program was created to facilitate the enforcement of the primary dam inspection law (11 AAC 93.150, Article 3 Dam Safety). The law states that dam owners are responsible for the safe operation, maintenance, repair, and rehabilitation of a dam, which are the essential elements in preventing dam failure; furthermore, dam owners are liable for the consequences of accidents or failures of their dams.

According to the State of Alaska 2023 HMP Update, the following have been identified as program limitation/challenges:

- Adequate staffing is an important aspect to program performance. In 2021, the State of Alaska had two full-time employees in the Dam Safety Office. The State Dam Safety Engineer stated that AS 46.17 allows the office to utilize consultants when necessary to execute the Alaska Dam Safety Program.
- Dam owners are responsible for the safe operation, maintenance, and emergency action planning for their respective dams. Many dam owners would welcome additional resources to support the safety of their dams (i.e., EAP development, infrastructure rehabilitation, additional engineering analysis, etc.). Many industries would benefit from more accurate/precise survey data, updated seismic mapping, and an updated PMP/AEP hydrologic study. These tools would benefit more than just dam owners.

**How the Participating Jurisdictions work with local dam owners and/or the state dam safety agency**: The dam owners in the Participating Jurisdictions (City of Akutan, City of Sand Point, City of False Pass, City of King Cove) works with the State of Alaska Dam Safety office in conjunction with Alaska General Laws. Specifically, § 11AAC 93.164: Owner's Emergency Action Plans. The participating jurisdictions coordinate with the Dam Safety Program to update EAPs for jurisdiction-owned dams. The participating jurisdictions also works closely with the Dam Safety Office during dam inspections and to address any dam safety deficiencies to jurisdiction-owned dams in a timely manner.

**Limitations and how the participating jurisdictions are attempting to address deficiencies**:

One limitation to dam safety in the Aleutians East Borough is that some of the dam owners are private and the participating jurisdictions do not own some of the dams in the jurisdiction. As the participating jurisdiction is not the owner, they are unable to directly resolve the compliance and safety issues. The participating jurisdictions are committed to continuing to work with the Dam Safety Office and dam owners in the Borough to ensure the safety of residents.

Another limitation is that **not all dams in the Borough have identified owners**, specifically the Squaw Harbor Dam on Unga Island. As of October 2026, the owner of this dam is unknown. The Alaska Dam

Safety Office recently inspected the Squaw Harbor Dam and based on observations; a preliminary rating of Poor was given due to seepage issues identified with the dam. The State of Alaska Dam Safety Engineer has preliminarily classified this dam as High Hazard Potential due to the downstream development and potential loss of life.

Another limitation is that **there has never been a significant dam failure in the Aleutians East Borough**, which may give a false representation of the Planning Areas' risk of a dam failure. This could also be a reason the dam owners may not have the urgency to address the safety concerns. Through this plan and additional outreach efforts, the participating jurisdictions are dedicated to sharing the Planning Area's risk to potential dam failure.

Several selected mitigation actions have been selected to address some of the limitations identified. See the specific jurisdiction annexes for HHPD related mitigation actions.

#### 3.2.3.1 Nature

**A dam is a barrier across flowing water that obstructs, directs, or slows down the flow, often creating a reservoir, lake, or impoundment.** Most dams have a section called a spillway or weir, over or through, which water flows, either intermittently or continuously. Dams commonly come in two types, embankment (the most common) and concrete (gravity, buttress, and arch). They also serve several purposes and provide essential benefits, including drinking water, irrigation, hydropower, flood control, and recreation (ASDSO 2026).

Large or small, dams have a powerful presence that is frequently overlooked until a failure occurs. Dams fail in two ways, a controlled spillway release done to prevent full failure, or the partial or complete collapse of the dam itself. In each instance, an overwhelming amount of water, and potentially debris, is released. Dam failures are rare, but when they do occur, they can cause loss of life and immense damage to property, critical infrastructure, and the environment (ASDSO 2026).

**Dams are classified as High hazard, Significant hazard, or Low hazard.** The classification is not based on whether a dam is deemed safe or unsafe, but rather the impact/magnitude of a potential failure (NID 2026).

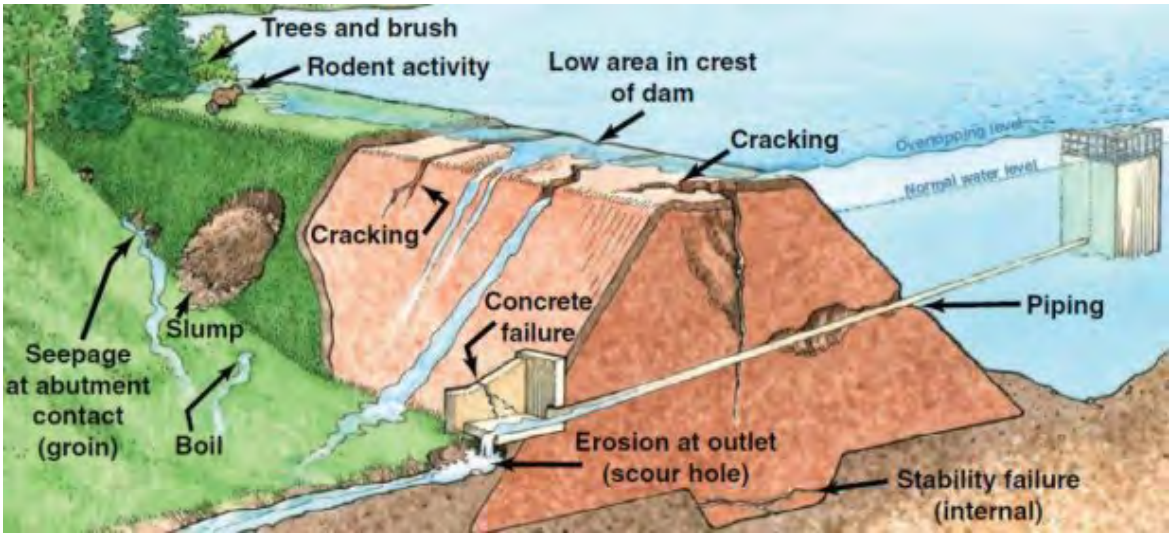
- A ***High Hazard*** dam is one whose failure or mis-operation will result in a probable loss of human life.
- A ***Significant Hazard*** dam is one whose failure or mis-operation results in no probable loss of human life but may cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety, or welfare.
- A ***Low Hazard*** dam is one whose failure or mis-operation results in no probable loss of human life and low economic losses.

**Dams are periodically inspected and given condition ratings.** Each dam's hazard classification determines the frequency of inspection. The higher the classification, the more frequently the inspection is conducted. As part of each inspection, the major components of the dam are subjectively rated as satisfactory, fair, poor, or unsatisfactory. The major components being inspected are the embankment, the spillway, and the low-level outlet.

The following outlines criteria for a given condition rating.

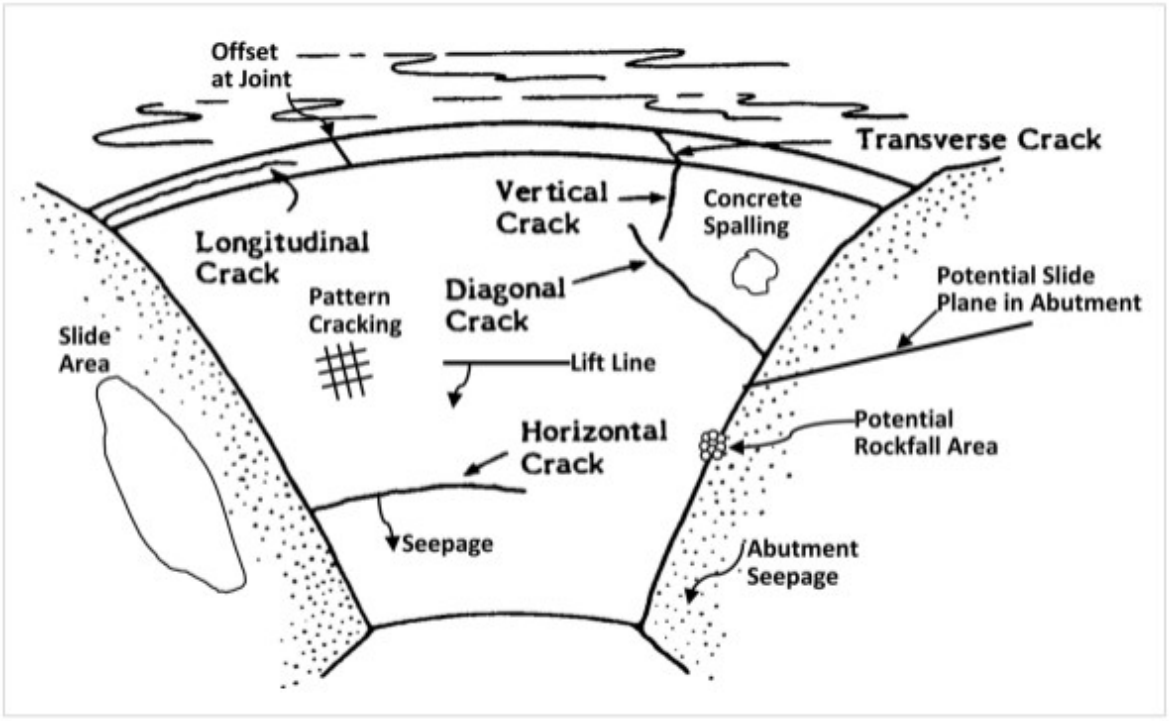
- ***Satisfactory***: No existing or potential dam safety deficiencies are recognized.
- ***Fair***: No existing or potential dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in dam safety deficiency.
- ***Poor***: A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.
- ***Unsatisfactory***: A dam safety deficiency is recognized as one that requires immediate or emergency remedial action for problem resolution.

- ***Not rated***: The dam has not been inspected or has been inspected but, for unknown reasons, has not been rated.




Source: FEMA Pocket Safety Guide for Dams and Impoundments 2016

**Figure 10- Causes of Dam Failure**




Source: FEMA Pocket Safety Guide for Dams and Impoundments 2016

**Figure 11- Visible Signs of Potential Failure Mechanisms of Concrete Dams**

### 3.2.3.2 Location

**The NID lists four (4) dams in the Aleutians East Borough Planning Area. The State of Alaska Dam Safety Engineer identified three (3) additional dams in the Aleutians East Borough Planning Area. The City of False pass identified one (1) additional dam in False Pass, and the City of King Cove identified two (2) additional dams in King Cove.**

**This Risk Assessment analyzes 9 dams in the Aleutians East Borough.**

Table 8 provides information on all the known dams in the Aleutians East Borough.

Figure 12 depicts the location and hazard classification of each dam in the Aleutians East Borough.

**Table 8- Dams in the Aleutians East Borough Planning Area**

| Name | Location/ Jurisdiction | NID ID | Hazard Classification | Most Recent Inspection | Dam Owner | Condition |
|---|---|---|---|---|---|---|
| Squaw Harbor Dam | Unga Island | AK00105 | High (Proposed) | Unknown | Unknown | Poor (Proposed) |
| Clear Creek Dam | King Cove | Not listed in the NID | High (Proposed) | Unknown | City of King Cove | Unknown |
| Delta Creek Dam | King Cove | Not listed in the NID | High (Proposed) | Unknown | City of King Cove | Unknown |
| Waterfall Creek Dam | King Cove | Not listed in the NID | Unknown | 2025 | City of King Cove | Unknown |
| Old Rams Creek Dam | King Cove | Not listed in the NID | Unknown | 2025 | City of King Cove | Unknown |
| Akutan Hydro Dam (Town Creek Hydroelectric Dam) | Akutan | AK00264 | Significant | 2018 | City of Akutan | Fair |
| Humboldt Creek Reservoir Dam | Sand Point | AK00268 | Significant | 2022 | City of Sand Point | Poor |
| New England Fish Co Dam | Sand Point | AK00122 | Significant | Unknown | Shumagin Corporation | Unsatisfactory |
| False Pass Water Dam | False Pass | Not listed in the NID | Unknown | Unknown | City of False Pass | Unknown |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026, Terra Firma Testing 2022

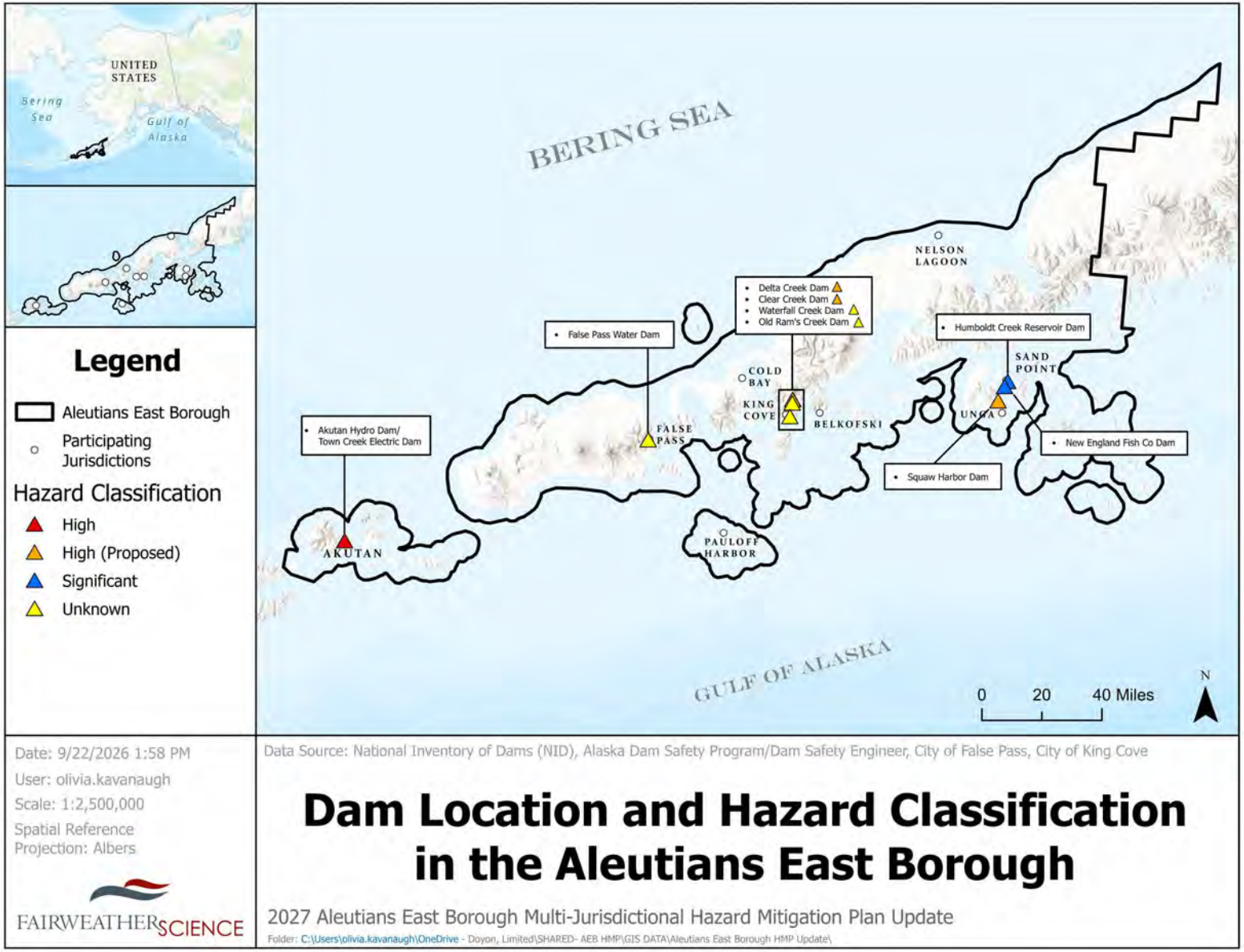



**Figure 12- Dam Location and Hazard Classification in the Aleutians East Borough**

Specifications on the nine (9) dams in the Aleutians East Borough Planning Area are below.

| NID ID #AK00105 Squaw Harbor Dam | |
|---|---|
| Hazard Classification | High (Proposed by Alaska State Dam Engineer) |
| Owner | Unknown |
| Year Built | Unknown |
| Dam Type | Unknown |
| Dam Purpose | Unknown |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | There is no available information about the inspection frequency or the last inspection date for Squaw Harbor Dam. |
| Downstream Description | There is one outflow creek below the dam embankment. The dam is approximately 800 feet from Squaw Harbor, which is in Baralof Bay on Unga Island. |
| Downstream Area | The Squaw Harbor Dam structure discharges into a creek which flows into Squaw Harbor. The area downstream of the dam consists of dense vegetated riparian corridors until the creek reaches the cannery infrastructure and the surrounding rocky coastline. |
| Downstream Dams | There are no dams immediately downstream of the Squaw Harbor Dam. |
| Downstream Bridges | There are no bridges downstream of Squaw Harbor Dam. |
| Reservoir Area | Squaw Harbor Dam reservoir is rectangular shaped (roughly), with a length of 630 feet at its longest and a width of 300 feet at its widest. |
| Downstream Development | Approximately 0.5 miles downstream of Squaw Harbor Dam is an abandoned cannery/fish processing facility, four (4) small buildings, and one gravel road. There is also caretaker dwelling that is downstream of the dam. |
| General findings of the last inspection | No information has been made available about the dam's most recent inspection, or what condition it was rated. Based on observations from the State of Alaska's dam coordinator, a preliminary rating of Poor was given due to seepage issues identified with the dam. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could also bring debris downstream. Potential inundation of the gravel road, caretaker facility, and cannery infrastructure are possible. Further, the reservoir would be drained to the level allowed by the dam break. |
| Recommended Hazard Potential Classification | The State of Alaska Dam Safety Engineer has preliminarily classified this dam as High Hazard Potential. Due to the downstream development and potential loss of life, this recommendation justified based on current classification guidelines. |

Source: State of Alaska Dam Safety Engineer 2026

| Clear Creek Dam | |
|---|---|
| Hazard Classification | High (Proposed by Alaska State Dam Engineer) |
| Owner | City of King Cove |
| Year Built | Unknown |
| Dam Type | Concrete |
| Dam Purpose | Hydroelectric |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | There is no information available about the inspection frequency of Clear Creek Dam, or the last inspection date. |
| Downstream Description | The dam outflow consists of a continuation of Clear Creek, which flows approximately 0.25 miles before its confluence with Delta Creek. Delta Creek flows another 4.5 miles downstream before depositing into Lenard Harbor. |
| Downstream Area | The Dam is located east of Anvil Mountain, in low shrub, alpine habitat. Clear Creek (the outflow) flows to its confluence with Delta Creek which then flows into more vegetated, lower lying lands for 4.7 miles before draining into Lenard Harbor. There are numerous roadways and two bridges downstream of the dam. |
| Downstream Dams | There are no dams immediately downstream of the Clear Creek Dam. |
| Downstream Bridges | There are three (3) bridges downstream of Clear Creek Dam. The first bridge allows Reservoir Dam Road to pass over Clear Creek approximately 300 feet downstream of the dam. The next two bridges occur downstream of the confluence of Clear Creek and Delta Creek, which means they are at risk of possible inundation from two different dams. The second bridge is approximately 0.9 miles downstream, allowing Waterfall Creek Road to pass over Delta Creek. The second bridge is approximately 1.1 miles downstream and allows AEB Route 1 to pass over Delta Creek. |
| Reservoir Area | The reservoir is continuously fed by Clear Creek upstream of the dam. The reservoir is narrow, approximately 150 feet long and 60 feet wide. |
| Downstream Development | King Cove Airport is located 1.5 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam. |
| General findings of the last inspection | There is no data available on the date of the last dam inspection, or what the condition assessment of Clear Creek dam is currently. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of Clear Creek and Delta Creek which could bring debris downstream. Potential inundation of Reservoir Dam Road, Waterfall Creek Road, and AEB Route 1 are possible, to include washouts or land destabilization along the roadways or bridges. It is possible that King Cove Airport could be damaged by a dam failure, along with Airport Road. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Clear Creek Dam. Based on the State of Alaska Dam Safety Engineer's preliminary inspection, critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: State of Alaska Dam Safety Engineer 2026, NHA 2023

| Delta Creek Dam | |
|---|---|
| Hazard Classification | High (Proposed by Alaska State Dam Engineer) |
| Owner | City of King Cove |
| Year Built | 1975 |
| Dam Type | Concrete |
| Dam Purpose | Hydroelectric |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | No information is available as to what the inspection frequency is for Delta Creek Dam. |
| Downstream Description | The dam outflow consists of a continuation of Delta Creek, which flows approximately 0.25 miles before Clear Creek joins Delta Creek. From Delta Creek Dam, Delta Creek flows another 4.7 miles downstream before depositing into Lenard Harbor. |
| Downstream Area | The Dam is located east of Anvil Mountain, in low shrub, alpine habitat. Delta Creek (the outflow) then flows into more vegetated, lower lying lands for 4.7 miles before. There are numerous roadways and two bridges downstream of the dam. Clear Creek dam is also downstream of Delta Creek Dam. |
| Downstream Dams | There is one (1) dam downstream of the Delta Creek Dam. Clear Creek Dam is located approximately 450 feet downstream and to the east of the Delta Creek Dam-Clear Creek Dam is not located in the same water drainage of Delta Creek Dam. |
| Downstream Bridges | There are two (2) bridges downstream of Delta Creek Dam. The first bridge is approximately one mile downstream, allowing the Waterfall Creek Road to pass over Delta Creek. The second bridge is approximately 1.25 miles downstream and allows AEB Route 1 to pass over Delta Creek. |
| Reservoir Area | The reservoir area is very small, with an approximate length of 90 feet and width of 45 feet. The reservoir is continuously fed by Delta Creek. |
| Downstream Development | Although it never crosses Delta Creek, Airport Road parallels the creek for approximately 1.8 miles. King Cove Airport is located 1.6 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam. |
| General findings of the last inspection | No information has been made available about the dam's most recent inspection, or what condition it was rated. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of Delta Creek which could bring debris downstream. Potential inundation of Waterfall Creek Road, and AEB Route 1 are possible, to include washouts or land destabilization along the roadways or bridges. It is possible that King Cove Airport could be damaged by a dam failure, along with Airport Road. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Delta Creek Dam. Based on the State of Alaska Dam Safety Officer's preliminary inspection, critical infrastructure downstream, and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: State of Alaska Dam Safety Engineer 2026

| NID ID #AK00264 Akutan Hydro Dam (Town Creek Hydroelectric Dam) | |
|---|---|
| Hazard Classification | Significant |
| Owner | City of Akutan |
| Year Built | 1993 |
| Dam Type | Earth |
| Dam Purpose | Hydroelectric |
| Length x Height | 200 ft x 21 ft |
| Drainage Area | Unknown |
| Inspection Frequency | The most recent inspection was June 20, 2018. Inspection frequency is every 3 years. |
| Downstream Description | The outflow of the dam creates a small creek, which flows downstream until reaching Akutan Harbor. The creek terminates after descending 760 feet of elevation over 0.75 miles. There is an access trail that parallels the creek, and multiple roads and infrastructure along the coastline, on both sides of the creek mouth. |
| Downstream Area | The downstream area consists of steep, sparsely vegetated land. There is no infrastructure besides an access trail until the creek reaches the coast, where there are numerous structures to the east and the west of the creek mouth. |
| Downstream Dams | There are no dams immediately downstream of Akutan Hydro Dam. |
| Downstream Bridges | There are two (2) bridges downstream of Akutan Hydro Dam. One allows the access trail to pass over the top of the dam. The second bridge is on the coastline, allowing the Boardwalk Road to cross over the creek. |
| Reservoir Area | Akutan Hydro Dam (Town Creek Hydroelectric Dam) has a maximum capacity of 20 acre feet and a surface area of 1.4 acres. The reservoir is approximately 460 feet long and 210 feet wide. |
| Downstream Development | The Akutan Hydro Dam outflow does not intersect any development (other than the access route) until the creek reaches the coastline. On the coastline, there are 21 structures within .25 miles of the Creek mouth – including the Trident Seafoods Plant. |
| General findings of the 2018 inspection | The condition assessment of the 2018 inspection found the Akutan Hydro Dam in **Fair** condition. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. Potential inundation of the access trail, permanent structures in the inundation area can happen. Due to the steep slope of the outflow, land destabilization could be anticipated during a dam break. |
| Recommended Hazard Potential Classification | The US Army Corps of Engineers, through the National Inventory of Dams, have classified this dam as Significant Hazard Potential. Due to the downstream development and potential loss of life, this recommendation is justified based on current classification guidelines. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026



Source: DMLW 2023

**Figure 13- Akutan Hydro Dam (Town Creek Hydroelectric Dam)**

| NID ID #AK00268 Humbolt Creek Reservoir Dam | |
|---|---|
| Hazard Classification | Significant |
| Owner | City of Sand Point |
| Year Built | Unknown |
| Dam Type | Earth |
| Dam Purpose | Water Supply |
| Length x Height | 395 ft x 19 ft |
| Drainage Area | 4.7 square miles |
| Inspection Frequency | The most recent inspection date is January 21, 2022. The dam is inspected every three years. |
| Downstream Description | There are four culverts in the dam embankment that drain water from the dam, creating a stream that flows into the ocean. Approximately 800 feet downstream of the dam outflow, Humboldt Creek widens to almost 300 feet when reaching the tidal zone. The downstream area is treeless and compromised of tundra plants and low-lying brush. |
| Downstream Area | The Humboldt Creek Reservoir Dam downstream area contains industrial/commercial property, both primary and secondary roads, utilities, and a small boat harbor. |
| Downstream Dams | There are no dams immediately downstream of the Humboldt Creek Reservoir Dam. |
| Downstream Bridges | There are two bridges downstream of the Humboldt Creek Reservoir Dam. One is a pedestrian bridge and a vehicle bridge. The vehicle bridge is on Sand Point Rd, and the pedestrian bridge connects the small boat harbor to the northern peninsula across from the small boat harbor. Airport Road also crosses over the top of the dam. |
| Reservoir Area | The maximum impoundment volume is 55-acre feet, with a reservoir maximum storage surface area of 11 acres. The reservoir is approximately 800 feet long and 360 feet wide. |
| Downstream Development | Sand Point lies approximately 0.4 miles to the west of the dam. In the tidal zone, which is approximately 250 yards beyond the dam outflow, is a large amount of development. There is Sand Point Rd and bridge, the Robert E. Galovin Small Boat Harbor and its pedestrian bridge. There is also the Trident Seafoods Processing plant. |
| Overall assessment of the 2022 inspection | At the time of the most recent inspection, the condition assessment of the dam was rated as Poor**.** The primary reason for the designation was due to a crack in the earthen embankment and buckling of culverts that run through the dam embankment. These are likely due to recent earthquakes occurring in the vicinity of Sand Point. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026

| NID ID #AK00122 New England Fish Co Dam | |
|---|---|
| Hazard Classification | Significant |
| Owner | Shumagin Corporation |
| Year Built | 1940 |
| Dam Type | Earth |
| Dam Purpose | Water Supply |
| Length x Height | 283 ft x 10 ft |
| Drainage Area | Unknown |
| Inspection Frequency | The most recent inspection is unknown. Inspection frequency is every 5 years. |
| Downstream Description | New England Fish Co Dam is located approximately 0.6 miles from Popof Straight, where the outflow creek terminates after crossing underneath the Sand Point Airport. |
| Downstream Area | The New England Fish Co Dam structure discharges into its outflow creek. The creek flows through a narrow, deep canyon before up against the Sand Point Airport and discharging in Popof Straight. The drainage canyon is heavily brushed with no infrastructure. There is the Old Reservoir to Red Cove Trail to the south of the outflow creek and several unnamed access trails to the north of the access creek. They meet at the top of the dam. |
| Downstream Dams | There are no dams immediately downstream of New England Fish Co Dam. |
| Downstream Bridges | There is one (1) bridge downstream of New England Fish Co Dam. The outflow creek flows up against the east side of the Sand Point Airport runway and then turns south and crosses under a trail bridge. Additionally, there is a motorized trail that runs across the top of the dam. |
| Reservoir Area | New England Fish Co dam has a maximum capacity of 105-acre feet and a surface area of 8.5 acres. The reservoir is approximately 1,000 feet long and 580 feet wide. |
| Downstream Development | The major downstream development of New England Fish Co Dam is the Sand Point Airport. The runway butts against the outflow creek, where it then turns sharply parallel to the runway. The airport terminal and support structures are located on the northeast side of the runway, and these structures are protected from potential inundation due to Arch Rock and the surrounding hill between the infrastructure and the outflow creek. |
| General findings of the most recent inspection | A preliminary inspection by the State of Alaska Dam Safety Engineer, based on observations, rated the dam in **Unsatisfactory** condition. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. Potential inundation of Sand Point Airport runway and Old Reservoir to Red Cove Road could delay or prohibit air transportation to and from Sand Point. |
| Recommended Hazard Potential Classification | The State of Alaska Dam Safety Engineer has recommended classifying this dam as having Significant Hazard Potential. Due to the proximity to the airport, other downstream development and potential loss of life, this recommendation is justified based on current classification guidelines. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026

| False Pass Water Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of False Pass |
| Year Built | Unknown |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | There is no information available about the inspection frequency of False Pass Water Dam. The last inspection was conducted on September 9, 2025. |
| Downstream Description | The dam outflow consists of a small, narrow outflow creek. Approximately 0.25 miles downstream, the water pumphouse is adjacent to the creek. The False Pass school, Mountain Valley Road, and the Isanotski Cemetery. |
| Downstream Area | The Dam is located Northwest of False Pass, in low shrub habitat. The most recent inspection noted the access trail from the Water Pumphouse to the dam was engulfed by salmonberry bushes, cow parsnip, and alder trees. |
| Downstream Dams | There are no dams immediately downstream of the False Pass Water Dam. |
| Downstream Bridges | There is one (1) bridge downstream of False Pass Water Dam. Approximately 1.25 miles downstream, a bridge crosses over the outflow stream, allowing Beach Road to pass over the top. |
| Reservoir Area | Unknown |
| Downstream Development | The Water Pumphouse is the first structure downstream of the dam, approximately 0.25 miles downstream. Located on Bobby Drive, other structures downstream are (in order, going downstream) Mountain Valley Road, False Pass School, Isanotski Corporation building, Isanotski Cemetery, and Beach Road. There is one bridge downstream, allowing Beach Road to cross over the outflow creek. |
| General findings of the last inspection | While no definitive inspection rating was given to False Pass Water Dam during the 2025 inspection, all aspects of the dam were found to be in good condition with no observed defects or repair needs. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. Potential inundation of False Pass School, the Water Pumphouse, Isanotski Corporation building, and the Isanotski Cemetery are possible. Bobby Drive, Mountain Valley Road, and Beach Road are also at risk of inundation due to dam failure. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for False Pass Water Dam. Based on the critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: City of False Pass Planning Team, HDR 2025

| Old Rams Creek Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of King Cove |
| Year Built | 1975 |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | The length of the dam is approximately 45 feet long. The height is unknown. |
| Drainage Area | Unknown |
| Inspection Frequency | The dam is inspected annually by the City of King Cove Public Works Department The last inspection was conducted in 2025. |
| Downstream Description | The dam outflow consists of a small, narrow outflow creek, Ram Creek. Old Ram's Creek Dam Road parallels Ram Creek the entire length of the creek. The creek runs through typical Aleutian vegetation, primarily alders and salmonberry bushes and devoid of trees. The creek terminates 1.6 miles downstream of the dam into King Cove. |
| Downstream Area | The dam is located Southwest of the population center in King Cove. |
| Downstream Dams | There are no dams immediately downstream of the Old Ram's Creek Dam. |
| Downstream Bridges | There is one (1) bridge downstream of Old Ram's Creek Dam. Approximately 1.5 miles downstream, a bridge crosses over the outflow stream, allowing Rams Creek Road to pass over the top. |
| Reservoir Area | Unknown |
| Downstream Development | Old Ram's Creek Dam Road parallels Rams Creek the entire length of the creek. Approximately 1.5 miles downstream of the dam, King Cove School, King Cove Powerhouse and multiple residential structures are located North of the creek. South of the creek, immediately adjacent to the creek, is the King Cove Baseball Field, and approximately 0.2 miles South is the King Cove Public Works building and the Agdaagux Tribe of King Cove building. |
| General findings of the last inspection | No definitive inspection rating was given to Old Ram's Creek Dam during the 2025 inspection. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Old Rams Creek Dam. |

Source: City of King Cove Planning Team

| Waterfall Creek Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of King Cove |
| Year Built | 2017 |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | The dam is approximately 60 feet long. The height is unknown. |
| Drainage Area | Unknown |
| Inspection Frequency | Waterfall Creek Dam is inspected annually by the City of King Cove Public Works. The last inspection was conducted in 2025. |
| Downstream Description | The dam outflow immediately flows into Delta Creek. Approximately 0.25 miles downstream, the water pumphouse is adjacent to the creek. The False Pass school, Mountain Valley Road, and the Isanotski Cemetery. |
| Downstream Area | Although it never crosses Delta Creek, Airport Road parallels the creek for approximately 1.8 miles. King Cove Airport is located 1.6 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam |
| Downstream Dams | There are no dams immediately downstream of the Waterfall Creek Dam. |
| Downstream Bridges | There is one (1) bridge downstream of Waterfall Creek Dam. Approximately 0.25 miles downstream, a bridge crosses over the Delta Creek Dam, allowing AEB Route 1 to pass over. |
| Reservoir Area | Unknown |
| Downstream Development | The AEB Route 1 parallels Delta Creek for the majority of the route between the dam and King Cove. While approximately 1.2 miles to the South of Delta Creek, the King Cove Airport is downstream of the dam as well. The Water Pumphouse is the first structure downstream of the dam, approximately 0.25 miles downstream. There is no other development downstream of the dam. |
| General findings of the last inspection | There was no definitive inspection rating given to Waterfall Creek Dam during the 2025 inspection. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Waterfall Creek Dam. |

Source: City of King Cove Planning Team

#### 3.2.3.3 History

Based on available records, there has never been a significant failure at any dams in the Aleutians East Borough.

In the City of Sand Point 2022 Council Meeting, it was revealed that the Humboldt Creek Reservoir Dam 2022 dam inspection showed damage, likely caused by seismic activity (SP 2022). However, this has not led to any form of dam failure at this time.

#### 3.2.3.4 Extent (Magnitude and Severity)

Heavy rainfall and flood events may affect the structural integrity of dams that would affect the Aleutians East Borough Planning Area. Other natural hazards that are less predictable/ forecastable, like landslides or earthquakes, can also impact the structural integrity of dams and could lead to failure. Poor or infrequent maintenance, seismic activity, and severe weather can also weaken the integrity of a dam.

***Detailed dam failure inundation mapping is not available for any dams in the Aleutians East Borough.***

The Squaw Harbor Dam and New England Fish CO Dam were observed to be experiencing seepage issues due to cracks in the dam (State of Alaska Dam Safety Engineer 2026).

The Humboldt Creek Reservoir Dam has observed cracks and outflow culvert damage, presumably from seismic activities in the last 6 years (State of Alaska Dam Safety Engineer 2026)

Based on the most recent condition assessments and the criteria identified in Table 4, the magnitude and severity of dam failure in the Aleutians East Borough Planning Area is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### 3.2.3.5 Impact

In the Aleutians East Borough Planning Area, severe weather, flooding, landslide/ground failure events, or seismic activity could all bring enough rain and/or snowfall or topographic change to cause a dam failure. The age and conditions of dams also pose a risk to the structural integrity of dams.

Dam failures result in impacts such as damage or destruction to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruption, and funding required to rehabilitate failed dams.

A dam failure will also cause secondary impacts to upstream and downstream flooding potential while the dam is not in operational order. Extreme precipitation events could impact drainages more severely than usual, due to space normally protected by the controlled release of a dam no longer afforded shielded from increased water flow.

A dam failure could generate a large and destructive flash flood downstream, depending on the size of the reservoir.

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | Due to a lack of historical dam failure events, there have not been any documented impacts to the geography or land in the Aleutians East Borough Planning Area.<br>If a dam failure were to occur, the downstream area could experience rapid flooding, sediment deterioration, debris flows, and damage to infrastructure and property. Potential impacts would depend on the location, size, and condition of the dam, the volume of water released, and the characteristics of the downstream drainage area. |
| Infrastructure | Due to a lack of documented historical dam failure events, there have been no documented impacts to infrastructure within the Aleutians East Borough Planning Area.<br>If a dam failure were to occur, the sudden release of water could damage or destroy downstream roads, bridges, culverts, utilities, water and wastewater systems, |

| | Description of Previous/Potential Impacts |
|---|---|
| | communications infrastructure, homes, and other critical facilities. Floodwaters and debris could also block transportation routes and limit access to affected communities, potentially delaying emergency response and disrupting essential services. |
| People | Due to a lack of documented historical dam failure events, there have been no documented impacts to people within the Aleutians East Borough Planning Area.<br>If a dam failure were to occur, the sudden release of water could create rapidly changing and potentially life-threatening flood conditions in downstream areas. Residents and people located near waterways or downstream areas could be exposed to flooding, debris, and dangerous water velocities. |
| Utilities | Due to a lack of documented historical dam failure events, there have been no documented impacts to utility systems within the Aleutians East Borough Planning Area.<br>If a dam failure were to occur, flooding and debris could damage or disrupt electrical systems, water and wastewater facilities, fuel storage and distribution systems, communications infrastructure, and other essential utilities located downstream. Damage to utility systems could result in power outages, interruptions to water and wastewater services, loss of communications, and disruption of other essential services. |
| Transportation | Due to a lack of documented historical dam failure events, there have been no documented impacts to transportation infrastructure within the Aleutians East Borough Planning Area.<br>If a dam failure were to occur, rapidly moving water, flooding, and debris could damage or wash out roads, bridges, culverts, and other transportation infrastructure located downstream. Flooding could also affect airport access, runways, taxiways, and associated facilities, potentially disrupting air service to and from affected communities. |
| Economy | Due to a lack of documented historical dam failure events, there have been no documented economic impacts from dam failure within the Aleutians East Borough Planning Area.<br>If a dam failure were to occur, flooding and damage to infrastructure could disrupt local businesses, commercial activities, fisheries, transportation, and other economic activities. Damage to roads, airports, utilities, facilities, and equipment could result in costly repairs, business interruptions, supply delays, and temporary loss of income. |
| Subsistence Resources | Due to a lack of documented historical dam failure events, there have been no documented impacts from dam failure to subsistence areas or resources within the Aleutians East Borough Planning Area.<br>If a dam failure were to occur, sudden flooding, sediment deterioration, and debris could affect streams, wetlands, shorelines, and other areas used for subsistence activities. Floodwater could damage or alter fish and wildlife habitat, affect water quality, and disrupt access to hunting, fishing, gathering, and other traditional subsistence areas. |

#### 3.2.3.6 Probability of Future Events

According to the Alaska Dam Safety Program:

> *Dam owners conduct routine monitoring and inspection of dams within the state on the previously identified schedule, with priority placed on those dams which pose the greatest potential threat. However, to fully determine the probability of a future event, a full engineering inspection would need to be completed on each dam, something beyond the scope of this program. The majority of these*

*more thorough inspections are conducted by an independent agency hired by the dam owner, FERC, or the USACE.*

*Dams undergoing repair and/or reconstruction are required to be designed to pass at least the 1%-annual-chance rainfall event with one foot of freeboard. The most critical and hazardous dams are required to meet a spillway design standard much higher than passing the runoff from a 1%-annual-chance rainfall event. Although not all the dams have been shown to withstand the 1%-annual-chance rainfall event, most of the dams meet this standard due to original design requirements or recent spillway upgrades.*

The probability for dam failure reduces when the dam is properly maintained and receives a "Satisfactory" condition rating.

Based on the criteria listed in Table 5 and the most recent condition assessments (if available), it is **Possible** that the Aleutians East Borough Planning Area will experience a dam failure event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year. Failure depends on loading conditions (existing condition, precipitation, seismic, deferred maintenance, etc.).

However, the State of Alaska Dam Safety Engineer warned of "condition creep", where observational assessments of Planning Area dams have rated dams more poorly than their most recent available condition rating. If dams in AEB continue to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### 3.2.3.7 Future Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in the Aleutians East Borough Planning Area. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in the Aleutians East Borough Planning Area. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in the Aleutians East Borough Planning Area. A potential outcome of changing climate in Alaska is an increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in the Aleutians East Borough Planning Area. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in the Aleutians East Borough Planning Area. Increased precipitation and frequency of severe weather events could contribute to more stress on dams in the Aleutians East Borough Planning Area. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to |

| Description of Future Conditions | |
|---|---|
| | safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in the Aleutians East Borough Planning Area as residents may relocate in and out of potential future inundation areas. Residents of the Aleutians East Borough Planning Area may also relocate out of the Aleutians East Borough Planning Area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in the Aleutians East Borough Planning Area. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted in inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in the Aleutians East Borough Planning Area.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes. See the individual hazard profiles for information on how future climate conditions may influence/impact future land use development and population patterns in Aleutians East Borough.

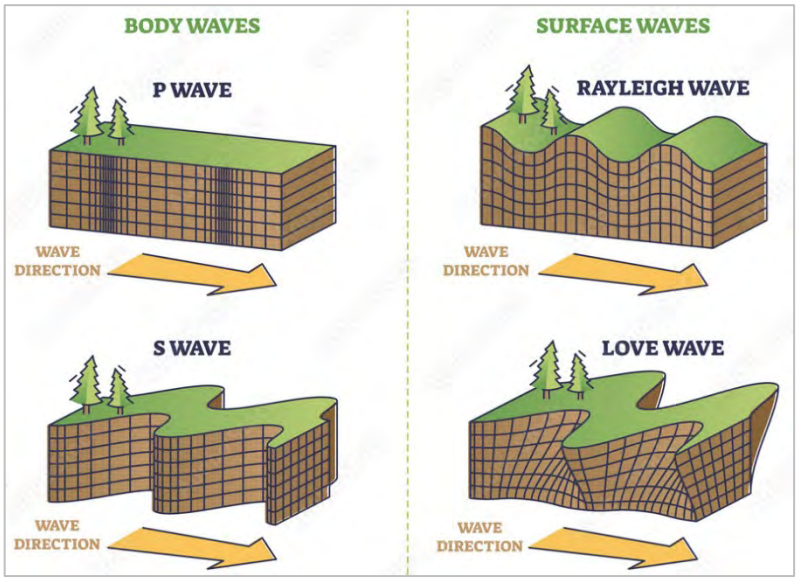
## 3.2.4 Earthquake

### 3.2.4.1 Nature

An earthquake can be defined as any shift along the Earth's tectonic plates and faults due to accumulated strain built up by friction which precipitates a sudden movement or trembling of the Earth's crust. This sudden movement can be felt at sometimes very distant sites from the epicenter, and it usually occurs without warning. The movement can build rapidly after just a few seconds and cause significant, sometimes catastrophic, damage and severe numbers of casualties, and this often-violent motion or shaking is the most common effect of earthquakes.

Alaska is one of the most seismically active regions in the world and has a high risk of societal and economic losses due to damaging earthquakes. Alaska averages one earthquake greater than M8 on the Richter Scale every 13 years, and one M7-8 earthquake every year.

Like sound, the motion of the ground is the strongest near the source and increases in concert with the amount of energy released. It also attenuates with distance, i.e., decreases in force as you travel farther away from the epicenter of the earthquake.




Source: Adobe Stock 2026

**Figure 14- Types of Seismic Waves**

An earthquake causes several types of waves both with the Earth's interior (body waves) and along the surface of the Earth (surface waves). Two distinct types of body waves are produced during an earthquake. Primary waves (P waves) are compressional and longitudinal in nature, and this causes back and forth oscillation in parallel to the direction of travel. Secondary waves (S or shear waves) are slower in nature than the P waves and cause vibrations that are in the side-to-side plane. Additionally, there are two types of surface waves: both Rayleigh and Love waves travel more slowly and take longer to pass than seismic waves, which can cause more damage to property (PSU 2025).

Besides the motion and resultant damage, there are also several other effects which occur due to earthquakes. These are:

**Fault Displacement:** this is distinct movement on the surface along the two sides of a seismic fault. These displacements can be very considerable in both length and width. During the historic Good Friday Earthquake of 1964, Alaska experienced significant displacement, with some areas experiencing as much as 11.6 meters vertically and a rupture line that extended for more than 800 kilometers (USGS 1966). There are three general types of faulting. Strike-slip faults are where each side of the fault moves horizontally. Normal faults have the overlying (hanging wall) side dropping down relative to the underlying (footwall) side. Thrust (reverse) faults have the hanging wall moving up and over the fault relative to the footwall. This type of faulting can cause severe damage to surface structures such as pipelines, roads, railways, and tunnels.

**Liquefaction:** when granular soil or sediments that is saturated temporarily behaves like a liquid due to the vibrations and surface movements. The empty spaces between the granules can collapse, and water pressure within the pores may increase enough to make the soil/sediments behave more like a fluid during the earthquake causing sometimes serious deformations. Horizontal movements (i.e., lateral spreading) of 5 meters are common but can be as much as 30 meters. Massive flows (i.e., flow failures) that are typically ten to a hundred meters can sometimes extend even to 6-7 kilometers. Liquefaction can also cause a

considerable loss of bearing strength, and this can result in structures settling significantly or tipping severely. All of this can result in severe property damage including building and bridge collapse as well as landslides and avalanches.

Both the intensity and magnitude are considered during the measurement of the severity of earthquakes. The observed level of damage and effects on people, nature, and human structures are variables when describing the intensity. The intensity generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. The scale most often used in the U.S. to measure intensity is the Modified Mercalli Intensity (MMI) Scale.

As shown in Table 9, the MMI Scale consists of 10 increasing levels of intensity that range from imperceptible to catastrophic destruction. Peak ground acceleration (PGA) is also used to measure earthquake intensity by quantifying how hard the earth shakes in each location or measured as acceleration due to gravity (g). The USGS describes the MMI Scale as:

> *"The effect of an earthquake on the Earth's surface is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally - total destruction. Although numerous intensity scales have been developed over the last several hundred years to evaluate the effects of earthquakes, the one currently used in the United States is the Modified Mercalli (MM) Intensity Scale.*
>
> *The Modified Mercalli Intensity value assigned to a specific site after an earthquake has a more meaningful measure of severity to the non-scientist than the magnitude because intensity refers to the effects actually experienced at that place."*

The following table is an abbreviated description of the comparisons of earthquake intensity, ground-shaking comparisons, perceived shaking, and damage.

**Table 9- Intensity/Ground-Shaking Comparisons**

| Intensity | PGA: Acceleration (%g) | Perceived Shaking | Damage |
|---|---|---|---|
| I | <0.0464 | Not felt | None |
| II-III | 0.0464 - 0.297 | Weak | None |
| IV | 0.297-2.76 | Light | None |
| V | 2.76 - 11.5 | Moderate | Very light |
| VI | 11.5 - 21.5 | Strong | Light |
| VII | 21.5 - 40.1 | Very Strong | Moderate |
| VIII | 40.1 - 74.7 | Severe | Moderate/Heavy |
| IX | 74.7 - 139 | Violent | Heavy |
| X+ | >139 | Extreme | Very Heavy |

Adapted from: USGS 2010, Er et al. (2010)

While it is impossible to predict the time and location of an earthquake, Alaska's active geology ensures that powerful and potentially damaging earthquakes will continue to occur and can impact anywhere in the State, including the Aleutians East Borough Planning Area.

#### 3.2.4.2 Location

Earthquakes are of concern in the Aleutians East Borough Planning Area because of the Borough's proximity to large fault systems. Secondary hazards such as landslides, avalanches, tsunamis and seiches may result from a significant earthquake.

Many of the prominent faults in the region are thought to be active. An active fault, in general, is a type of fault along which continuous or intermittent movement is taking place; motion may be abrupt or, in some cases, may be very slow. The closest active fault in the Aleutians East Borough Planning Area with

documented historic surface displacements is the Alaska-Aleutian Megathrust, which runs along the entire length of the Aleutian chain. It is part of the Aleutian subduction zone and where the Pacific and North American tectonic plates meet. It is one of the most seismically active faults in the world; the plates collide at a rate of 5-8 cm per year. The fault is located just south of the Aleutians East Borough Planning Area (IRIS 2026).

***The Aleutians East Borough Planning Area spans 118 miles along the 2,485 mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.***

Between 1938 and 1965, a series of large megathrust earthquakes ruptured almost the entire Aleutian subduction zone, from Prince William Sound all the way past Attu Island in the far western Aleutians. One notable patch of the subduction zone, however, did not rupture—the area roughly between Sand Point and Perryville. This section became known as the “Shumagin Gap,” and researchers have spent much effort to understand why that section did not rupture and whether it might be at risk of generating a tsunamigenic earthquake in the future.

Largely based on high-resolution GPS measurements, these researchers discovered that the subducting plate was poorly coupled to the overriding crust - meaning that the huge amount of energy necessary for a large earthquake simply wasn’t building up in the Shumagin Gap (UAF-AEC 2026).

New research indicates that the Shumagin Gap, contrary to recent speculation that it might be a relatively “safe” seismic zone in the Alaska-Aleutian Megathrust, may pose a threat like that of the rest of the Megathrust. The Gap has large, localized faults (called “splay faults”) above the megathrust. While most of the Megathrust may not be seismically locked in the gap, these splay faults could accumulate the stresses necessary for a large, tsunamigenic earthquake. Similar splay faults moved during the 2010 M9.0 Tohoku earthquake and contributed to the earthquake being much larger than previously thought possible in that area of Japan.

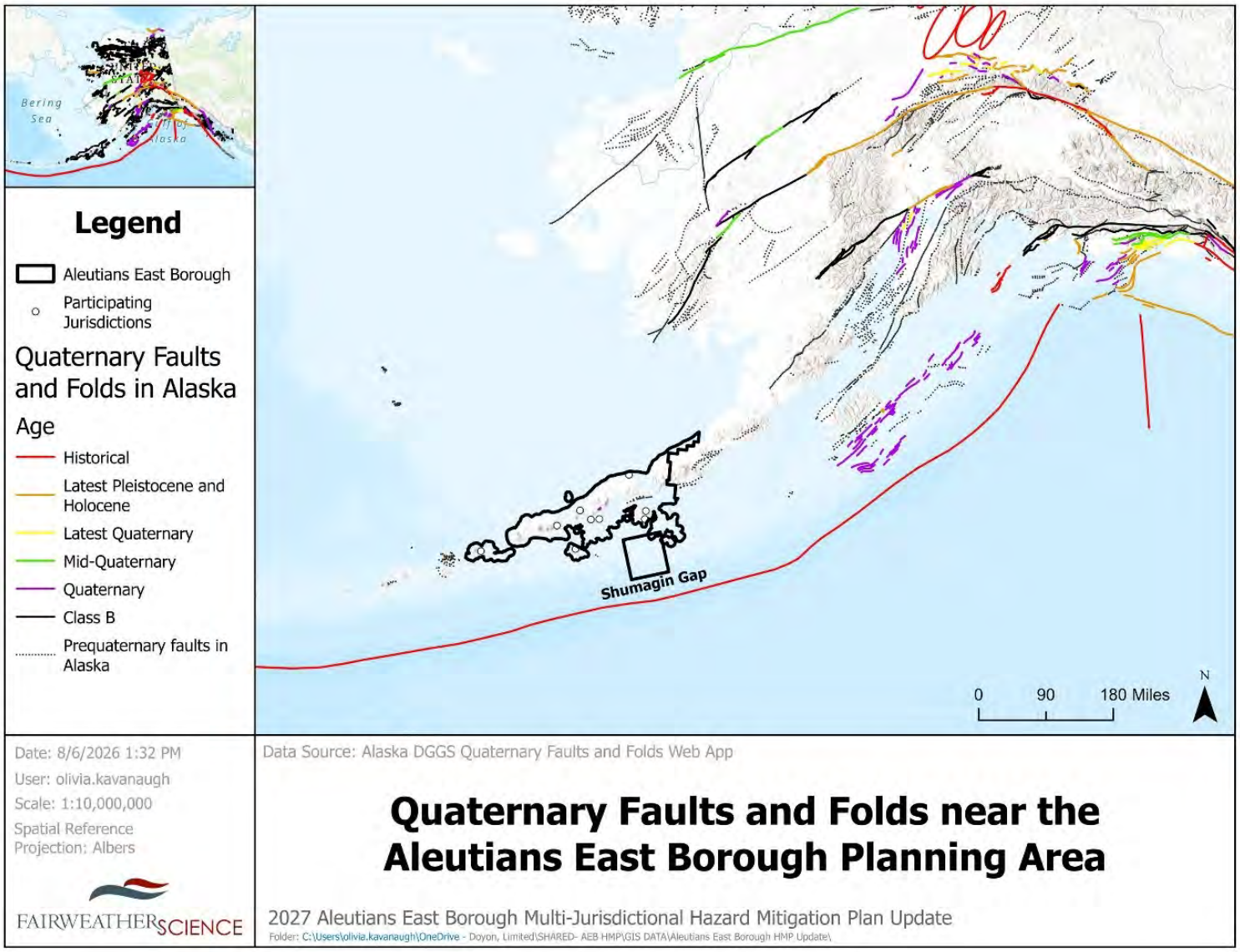



**Figure 15- Quaternary Faults and Folders near the AEB Planning Area**

### 3.2.4.3 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the Aleutians East Borough Planning Area boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

**Table 10- Historical Earthquakes M6.0 and Greater within the Aleutians East Borough Planning Area Boundary (1/1/1900-6/29/2026)**

| Date | Magnitude | Depth (miles) | Location |
|---|---|---|---|
| 1901-12-30 | 7.0 | Unknown | South of Alaska |
| 1907-08-22 | 6.5 | 120 | Bristol Bay, AK |
| 1910-05-13 | 6.63 | 15 | 291 km S of Sand Point, AK |
| 1917-05-31 | 7.4 | 35 | 54 km SE of Sand Point, AK |
| 1917-06-04 | 6.26 | 15 | 298 km SSE of Sand Point, AK |
| 1917-07-25 | 6.4 | 35 | 101 km SSW of Sand Point, AK |
| 1918-06-27 | 6.02 | 35 | 71 km SSE of Sand Point, AK |
| 1922-04-02 | 6.53 | 35 | 59 km ESE of Akutan, AK |
| 1922-07-02 | 6.81 | 35 | 73 km SW of Sand Point, AK |
| 1923-05-04 | 7.0 | 25 | 113 km ESE of Chignik, AK |
| 1924-08-14 | 6.04 | 15 | 195 km S of False Pass, AK |
| 1927-03-25 | 6.23 | 35 | 143 km SE of Perryville, AK |
| 1927-07-28 | 6.19 | 55 | 64 km SSE of Perryville, AK |
| 1927-08-06 | 6.2 | 35 | 74 km SE of Perryville, AK |
| 1929-02-26 | 6.52 | 30 | 47 km SE of False Pass, AK |
| 1929-10-14 | 6.13 | 25 | 166 km S of False Pass, AK |
| 1932-10-16 | 6.6 | 25 | 72 km SE of Sand Point, AK |
| 1932-10-30 | 6.35 | 35 | 68 km SE of Sand Point, AK |
| 1933-06-28 | 6.04 | 35 | 57 km SSE of Akutan, AK |
| 1933-10-14 | 6.17 | 25 | Unimak Island Region, AK |
| 1934-07-28 | 6.64 | 20 | 128 km SE of Chignik, AK |
| 1937-04-29 | 6.67 | 35 | 68 km SSE of King Cove, AK |
| 1938-11-10 | 8.23 | 35 | Semidi Islands, AK |
| 1938-11-11 | 6.56 | 35 | 104 km SSE of Perryville, AK |
| 1938-11-17 | 6.9 | 35 | 105 km ESE of Perryville, AK |
| 1939-08-20 | 6.25 | 75 | 102 km SSW of False Pass, AK |
| 1940-02-12 | 6.04 | 45 | 58 km SW of Sand Point, AK |
| 1940-03-16 | 6.13 | 15 | 118 km ESE of Chignik, AK |
| 1940-08-22 | 6.96 | 15 | 203 km SSE of Unalaska, AK |

| Date | Magnitude | Depth (miles) | Location |
|---|---|---|---|
| 1941-09-28 | 6.5 | 100 | 60 km ENE of Chignik, AK |
| 1941-11-06 | 6.38 | 25 | 109 km SSE of King Cove, AK |
| 1942-09-09 | 6.15 | 35 | 57 km SE of Unalaska, AK |
| 1942-12-09 | 6.16 | 35 | 36 km ESE of Unalaska, AK |
| 1944-07-27 | 6.43 | 65 | 60 km NE of Akutan, AK |
| 1945-03-18 | 6.24 | 25 | 189 km SE of Chignik, AK |
| 1946-04-01 | 8.6 | 15 | Unimak Island, AK |
| 1946-04-01 | 6.18 | 25 | 136 km SE of Akutan, AK |
| 1946-04-01 | 6.58 | 25 | 146 km ESE of Akutan, AK |
| 1946-04-02 | 6.23 | 25 | 136 km S of False Pass, AK |
| 1946-04-02 | 6.2 | 25 | 172 km SSE of False Pass, AK |
| 1946-04-02 | 6.06 | 25 | 136 km ESE of Akutan, AK |
| 1946-04-03 | 6.04 | 25 | 155 km S of False Pass, AK |
| 1946-10-30 | 6.55 | 30 | 83 km SE of Akutan, AK |
| 1946-11-12 | 6.17 | 25 | 156 km SE of Akutan, AK |
| 1947-05-02 | 6.11 | 35 | 111 km ESE of Akutan, AK |
| 1948-05-14 | 7.1 | 25 | 90 km SE of King Cove, AK |
| 1948-05-17 | 6.08 | 46.4 | 39 km SW of Sand Point, AK |
| 1951-11-08 | 6.25 | 35 | 141 km SSE of Sand Point, AK |
| 1952-08-28 | 6.04 | 43.2 | 15 km SSE of Sand Point, AK |
| 1953-02-25 | 6.3 | 47.7 | 112 km E of Chignik, AK |
| 1956-04-22 | 6.13 | 15 | 166 km SSE of King Cove, AK |
| 1956-08-30 | 6.1 | 28.8 | 132 km ESE of Akutan, AK |
| 1957-03-13 | 6.2 | 50 | 53 km S of Akutan, AK |
| 1957-03-22 | 7.07 | 46.6 | 39 km S of Akutan, AK |
| 1957-04-19 | 6.51 | 14.5 | 183 km S of Unalaska, AK |
| 1957-11-20 | 6.4 | 25 | 85 km ESE of Akutan, AK |
| 1961-01-14 | 6.04 | 21.9 | 129 km S of False Pass, AK |
| 1963-01-01 | 6.4 | 74.8 | 61 km ENE of Chignik, AK |
| 1963-01-28 | 6.62 | 35 | 72 km SE of King Cove, AK |
| 1965-02-06 | 6.29 | 21.7 | 226 km SSE of False Pass, AK |
| 1965-02-06 | 6.3 | 23.3 | 210 km S of King Cove, AK |
| 1966-05-19 | 6 | 30.1 | 106 km ESE of Akutan, AK |
| 1967-07-01 | 6.45 | 20 | 183 km SSE of Perryville, AK |

| Date | Magnitude | Depth (miles) | Location |
|---|---|---|---|
| 1972-03-24 | 6.36 | 69 | 77 km ESE of Chignik, AK |
| 1973-05-29 | 6 | 30 | 96 km SSW of False Pass, AK |
| 1974-02-06 | 6.5 | 2 | 81 km ESE of Akutan, AK |
| 1974-04-06 | 6 | 40 | 24 km S of Sand Point, AK |
| 1975-08-02 | 6.2 | 33 | 121 km SE of Chignik, AK |
| 1979-01-27 | 6 | 17 | 75 km ESE of King Cove, AK |
| 1979-02-13 | 6.7 | 33 | 121 km SE of Chignik, AK |
| 1979-05-20 | 6.4 | 71 | 104 km SSE of Ugashik, AK |
| 1982-01-25 | 6.1 | 60 | 90 km SE of Unalaska, AK |
| 1983-02-14 | 6.5 | 47 | 94 km ESE of Sand Point, AK |
| 1985-01-02 | 6 | 33 | 98 km ESE of Perryville, AK |
| 1985-10-09 | 6.6 | 30.2 | 85 km SE of Sand Point, AK |
| 1985-11-14 | 6.1 | 33 | 79 km SE of Sand Point, AK |
| 1987-06-21 | 6.5 | 34 | 88 km SE of False Pass, AK |
| 1988-05-22 | 6 | 33 | 137 km S of False Pass, AK |
| 1989-05-19 | 6.3 | 104 | 23 km NE of Akutan, AK |
| 1991-05-30 | 7 | 28.4 | 71 km SE of King Cove |
| 1992-02-13 | 6 | 44.2 | 59 km S of Akutan, AK |
| 1993-05-13 | 6.9 | 32.3 | 17 km S of Sand Point, AK |
| 1993-05-25 | 6.2 | 36.8 | 35 km S of Sand Point, AK |
| 1993-11-19 | 6.5 | 30.3 | 79 km SW of False Pass, AK |
| 1995-03-14 | 6.2 | 35.1 | 70 km ESE of King Cove, AK |
| 1995-07-08 | 6 | 21.1 | 143 km S of False Pass, AK |
| 1999-10-13 | 6.4 | 30 | 85 km ESE of King Cove, AK |
| 2002-05-25 | 6.4 | 33 | 159 km SSE of King Cove, AK |
| 2003-02-19 | 6.6 | 19 | 92 km SE of Akutan, AK |
| 2004-08-07 | 6 | 8 | 218 km SE of Nikolski, AK |
| 2005-11-20 | 6.2 | 30 | 115 km ESE of Akutan, AK |
| 2007-10-02 | 6.3 | 32 | 72 km SSE of King Cove, AK |
| 2011-07-16 | 6.1 | 36 | 72 km ESE of King Cove, AK |
| 2016-04-02 | 6.2 | 11.4 | 42 km E of Port Heiden, AK |
| 2018-12-31 | 6 | 31 | 87 km SE of King Cove, AK |
| 2020-07-22 | 7.8 | 28 | Perryville, AK |
| 2020-07-22 | 6.1 | 16.5 | 101 km ESE of Sand Point, AK |

| Date | Magnitude | Depth (miles) | Location |
|---|---|---|---|
| 2020-07-28 | 6.1 | 35.15 | 75 km SW of Sand Point, AK |
| 2020-10-19 | 7.6 | 28.4 | Sand Point, AK |
| 2021-07-29 | 8.2 | 35 | Chignik, AK |
| 2021-08-14 | 6.9 | 20.7 | 125 km SE of Perryville, AK |
| 2021-10-11 | 6.9 | 51.6 | 112 km E of Chignik, AK |
| 2023-07-16 | 7.2 | 25 | Sand Point, AK |
| 2025-07-16 | 7.3 | 38 | Sand Point, AK |
| 2025-07-20 | 6.2 | 40 | 91 km SSE of Sand Point, AK |

Source: USGS 2026

**2025 Sand Point Earthquake**

A M7.3 earthquake struck offshore of Sand Point on July 16, 2025. The epicenter was 55 miles (89 km) south of Sand Point and shaking, albeit light, was reported as far away as Anchorage and Juneau. Sand Point experienced the strongest ground shaking, where residents reported objects flying off shelves (AEC 2025). The National Tsunami Warning Center (NTWC) issued a tsunami warning immediately after the quake but later downgraded it to an advisory. Sand Point, King Cove, Kodiak, Old Harbor, Homer, Seward, and Unalaska all issued tsunami evacuations. No major wave arrived at any of these communities.

Due to its location near the Shumagin Gap on the Aleutian Megathrust, the Aleutians East Borough Planning Area has had a long history of earthquake events. The risk of an earthquake and its secondary hazards (flood, landslide, and tsunami) remain high in the Aleutians East Borough Planning Area. See Sections 3.2.5, 3.2.6, 3.2.10 for more information on these hazards.

#### 3.2.4.4 Extent (Magnitude and Severity)

Intensity is a subjective measure of the strength of the shaking experienced in an earthquake. Intensity is based on the observed effects of ground shaking on people, buildings, and natural features. It varies from place to place within the disturbed region depending on the location of the observer with respect to the earthquake epicenter.

A M2.0 or less is called a microearthquake; they cannot even be felt by people and are recorded only on local seismographs. Events of about M4.5 or greater are strong enough to be recorded by seismographs all over the world. A M5.0 earthquake is a “moderate” event, a M6.0 characterizes a “strong” event, a M7.0 is a “major” earthquake, and a “great” earthquake exceeds M8.0. Great earthquakes occur once a year on average worldwide; some examples of Great earthquakes are British Columbia 1700, Chile 1960, and Alaska 1964.

The intensity reported at different points generally decreases away from the earthquake epicenter. Local geologic conditions strongly influence the intensity of an earthquake; commonly, sites on soft ground or alluvium have intensities two to three units higher than sites on bedrock.

Figure 16 details the perceived shaking from an earthquake in Planning Area. Perceiving shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. These maps focus on the actual variations in shaking intensity across a region as felt by people and structures. Generally, the northeast side of Planning Area is at risk of experiencing Strong shaking, while the southern and western portions of AEB have the potential to experience Very Strong shaking.

Based on past event history and the criteria identified in Table 4, the magnitude and severity of earthquakes and resultant damages to people and infrastructure in the Aleutians East Borough Planning Area are considered is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

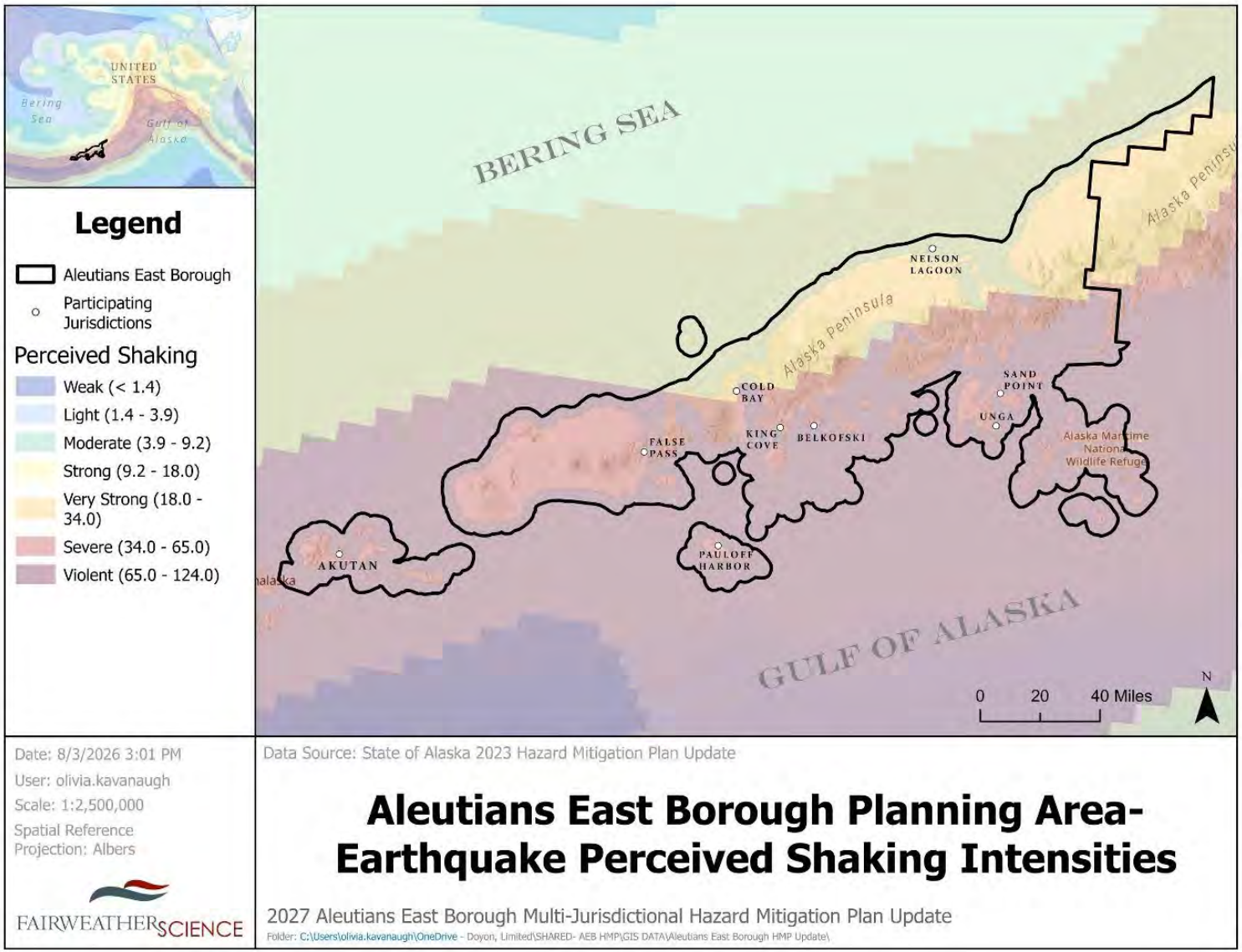



**Figure 16- AEB Planning Area Earthquake Perceived Shaking Intensities**

#### 3.2.4.5 Impact

An earthquake could affect the entire Planning Area and participating jurisdictions. The dangers associated with earthquakes include ground shaking, surface faulting, ground failures/landslides, snow avalanches, and tsunamis and seiches.

Most earthquake injuries and fatalities occur within buildings from collapsing walls and roofs, flying glass, and falling objects. As a result, the extent of the Aleutians East Borough Planning Area's risk depends not just upon its location relative to known faults, magnitude of the quake, distance from the epicenter and its underlying geology and soils, but also on the design of its structures. Buildings that have not been constructed to meet seismic standards can pose major threats to life and the continued functioning of key public services during an earthquake. Earthquake damage would likely be area-wide with potential damage to critical infrastructure including the complete abandonment of critical facilities. Impacts to community and individual drinking water wells (specific water supply infrastructure damages), in addition to temporary or permanent aquifer or water source changes are also a potential consideration.

In the 2022 inspection of the Humboldt Creek Reservoir Dam in Sand Point, a crack in the earth embankment was observed. The damage was contributed to seismic activity near Sand Point (Terra Firma Testing 2022).

**Tsunami/Seiche Potential:** Tsunamis are generated by sudden vertical motion of the sea floor. Because of the proximity between the Aleutians East Borough Planning Area and the Alaska-Aleutian Megathrust, the likelihood of a tsunami is relatively high in the Aleutians East Borough Planning Area (USGS 2025). Earthquake ground shaking can indirectly cause locally generated waves by triggering landslides in the steep terrain nearby. If a major landslide enters sea water or occurs on the seafloor, a large local wave can be generated that can cause severe damage to people and facilities along nearby shorelines. Due to the wave's ability to travel from the source to the coast in a matter of minutes, this local wave can strike with little warning.

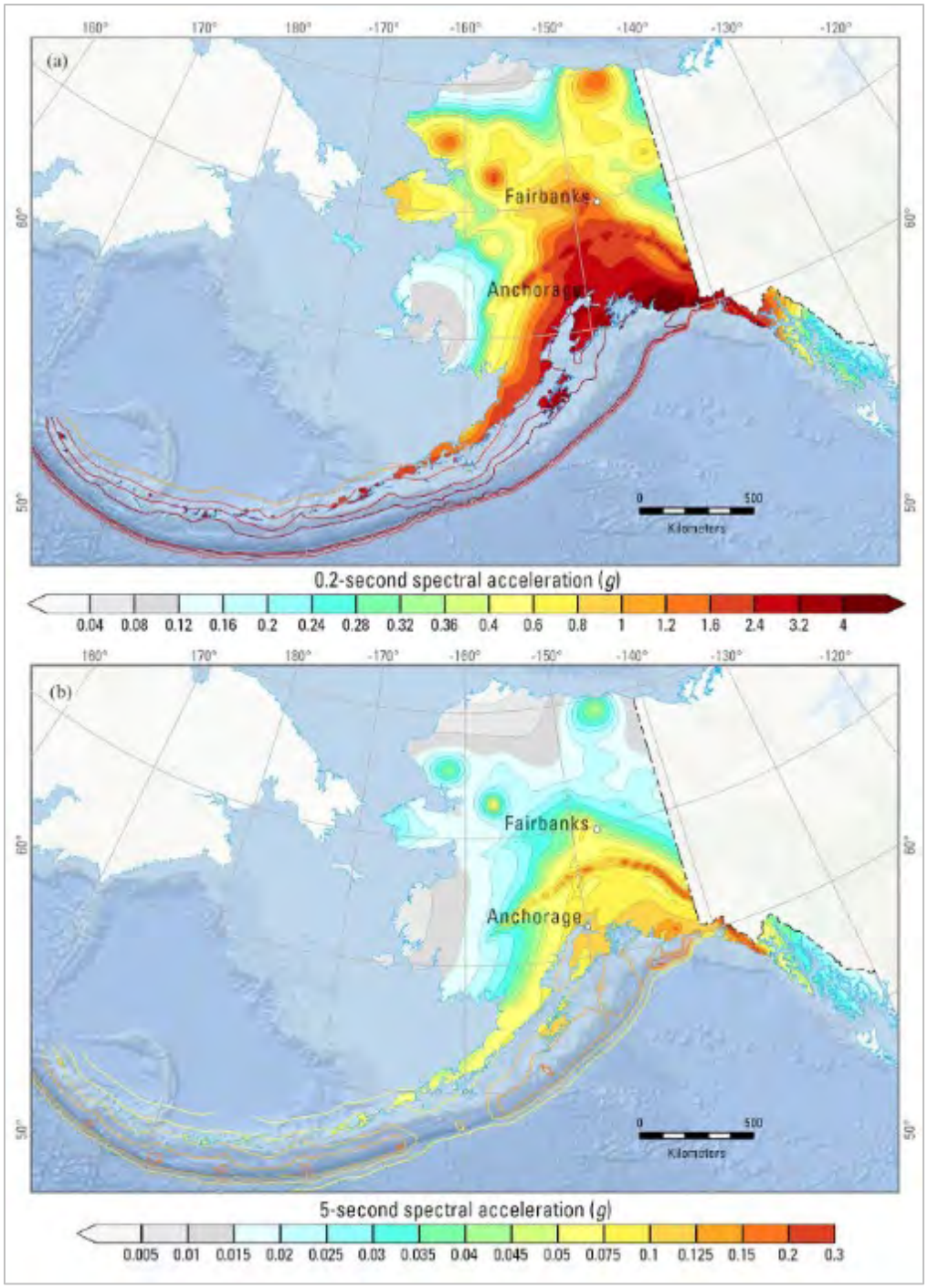
More information on potential tsunami/seiche impacts in the Aleutians East Borough Planning Area can be found in Section 3.2.10.

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | There have been no recorded earthquake impacts on the geography or land in the Aleutians East Borough Planning Area. An earthquake has the potential to trigger landslides, open cracks in the earth, and change the shoreline. |
| Infrastructure | While shaking has been perceived in the Aleutians East Borough Planning Area, no reports of damage to buildings have been reported. Humboldt Creek Reservoir Dam was reported to have cracks and seepage issues, per the 2022 inspection report (Terra Firma Testing 2022). The damage was most likely caused by seismic activity. A large earthquake could crack foundations and roadways and flatten buildings and other structures in the case of extremely severe earthquakes. |
| People | No injuries or fatalities due to earthquakes have been reported in the Aleutians East Borough Planning Area. Earthquakes could cause injury or death by toppling structures with people inside, or debris falling onto individuals. |
| Utilities | There are no recorded impacts on utility systems due to past earthquakes in the Aleutians East Borough Planning Area. Earthquakes can damage sewer and water lines, and down telephone poles. |
| Transportation | There are recorded transportation system impacts due to earthquakes in the Aleutians East Borough Planning Area. According to the Pauloff Harbor planning team, the Sand Point dock and harbor have experienced damages due to seismic activity in the past, affecting marine transportation. In the future, earthquakes could damage roadways or airport runways, limiting road and air travel, or cause a tsunami that could damage boat harbors and other water travel infrastructure. |

| | Description of Previous/Potential Impacts |
|---|---|
| Economy | There are no recorded economic impacts due to earthquakes in the Aleutians East Borough Planning Area. |
| Subsistence Resources | There are no recorded earthquake caused impacts on subsistence resources. |

### 3.2.4.6 Probability of Future Events

Figure 17 shows the updated 2023 National Seismic Hazard Model Seismic hazard maps. The maps show 2% probability of exceedance in 50 years at two spectral periods; 0.2 and 5 seconds. Spectral acceleration is the measure of maximum force by a mass on top of a rod having a particular natural vibration period. Short buildings (example less than 7 stories), have short natural periods of 0.2-0.6 sec. Tall buildings have long natural periods of 0.7 sec or longer.




Source: Powers et al., 2023

**Figure 17- 2023 National Seismic Hazard Model Seismic Hazard Maps- 2% Probability of Exceedance in 50 years**

Based on historical data in the Aleutians East Borough Planning Area, a M6.0 earthquake is possible in any time.

Based on previous occurrences and the criteria identified in Table 5, it is **Highly Likely** that there will be an earthquake of any magnitude within 100 miles of the Aleutians East Borough Planning Area within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and based on the history of events, the probability of occurrence is greater than 33% likely per year.

#### 3.2.4.7 Future Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The characteristics and nature of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Location | The location of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Extent | The extent of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Impact | The impact of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Probability of Future Events | The probability of future earthquake events is not affected by changing climate conditions and is not expected to change on human timescales (Alaska DHS&EM 2023). |
| Population Patterns | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, population patterns in the Aleutians East Borough Planning Area (all jurisdictions) are not expected to be affected. |
| Land Use Development | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, land use development in the Aleutians East Borough Planning Area (all jurisdictions) is not expected to be affected. |
| Subsistence Resources | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, subsistence resources in the Aleutians East Borough Planning Area (all jurisdictions) are not expected to be affected. |

## 3.2.5 Flood

### 3.2.5.1 Nature

Flooding occurs when water accumulates in areas that typically do not hold water, and it can result when natural or artificial barriers such as stream banks and levees that would usually protect adjacent floodplains become compromised. Floodplains are the low-lying grounds adjacent to water bodies and are formed mainly of sediment deposits from past flooding events. Flooding is typically a natural event that is predictable based on rainfall patterns. It is considered a hazard when people and property are at risk.

Floods can occur due to a combination of factors, including heavy snowpack, temperature, sunshine, and precipitation. Spring floods on streams may occur because of an above-normal snowfall during the winter followed by an unusually cold spring and a rapid snowmelt. Summer and fall floods usually result from intense precipitation. The principal flood problems are natural obstructions such as vegetation along the banks, manmade obstructions such as bridges and boat docks, ice jams, the accumulation of brush and debris along and within the streambed which can be carried downstream by high water and block bridge openings or other constrictions, and inadequately sized culverts.

Local observations also demonstrate that flood vulnerability can be influenced by interacting coastal conditions. For example, one community reports that storm-surge flooding occurs when very high tides are accompanied by southerly winds, while declining seasonal sea-ice protection has increased shoreline exposure to storms and high tides. These interacting conditions are discussed further in the Changes in the Cryosphere - Sea Ice and Sediment Deterioration and Land Destabilization hazard profiles.

Flooding is Alaska's most common natural hazard, causing major disruptions to local economies, damages to property and infrastructure, and occasionally loss of life. Development in floodplains is often a focus of mitigation, as flooding-related damages can occur when human development encroaches on floodplains when altering waterways, developing watersheds, and/or building inappropriately within a floodplain. Artificial fill, for example, can reduce an area's flood-carrying capacity thereby increasing the flood hazard.

***The primary flooding hazards in the Aleutians East Borough Planning Area are coastal flooding/storm surge, king tides, snowmelt, and rainfall run-off floods. Much of the Aleutians East Borough Planning Area's infrastructure development is located near the Gulf of Alaska or the Bering Sea.***

**Coastal flooding** occurs along the coast when the combined effects of coastal storm surge, tides, and waves exceed local land elevations of beaches and coastal plains. **Storm surge** is caused by coastal storms, which start as low-pressure weather systems moving across large bodies of water. These systems draw water toward the low-pressure center, building a bulge of water that moves with the system that is called storm surge. Flooding occurs when this storm surge reaches the coast and is driven landward.

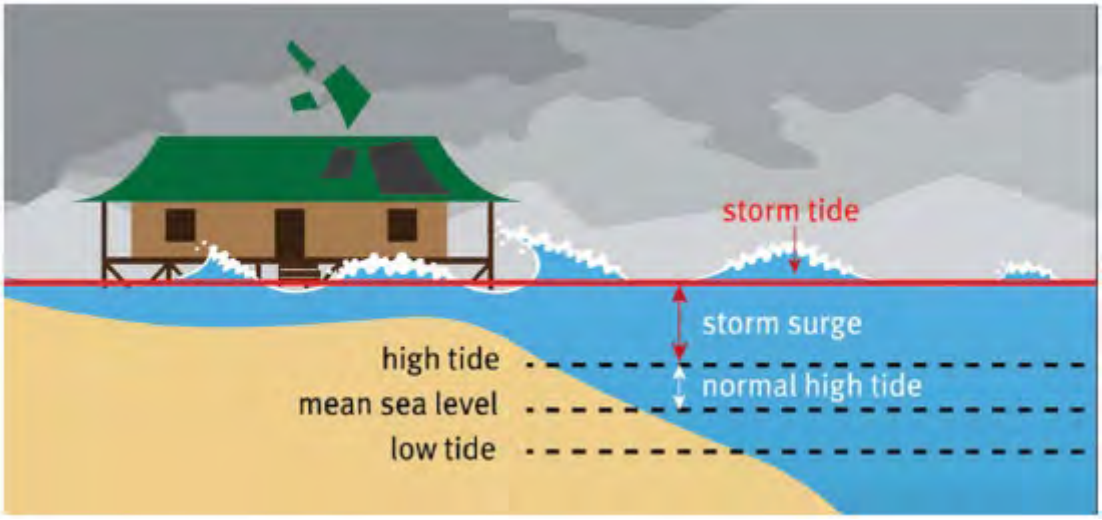
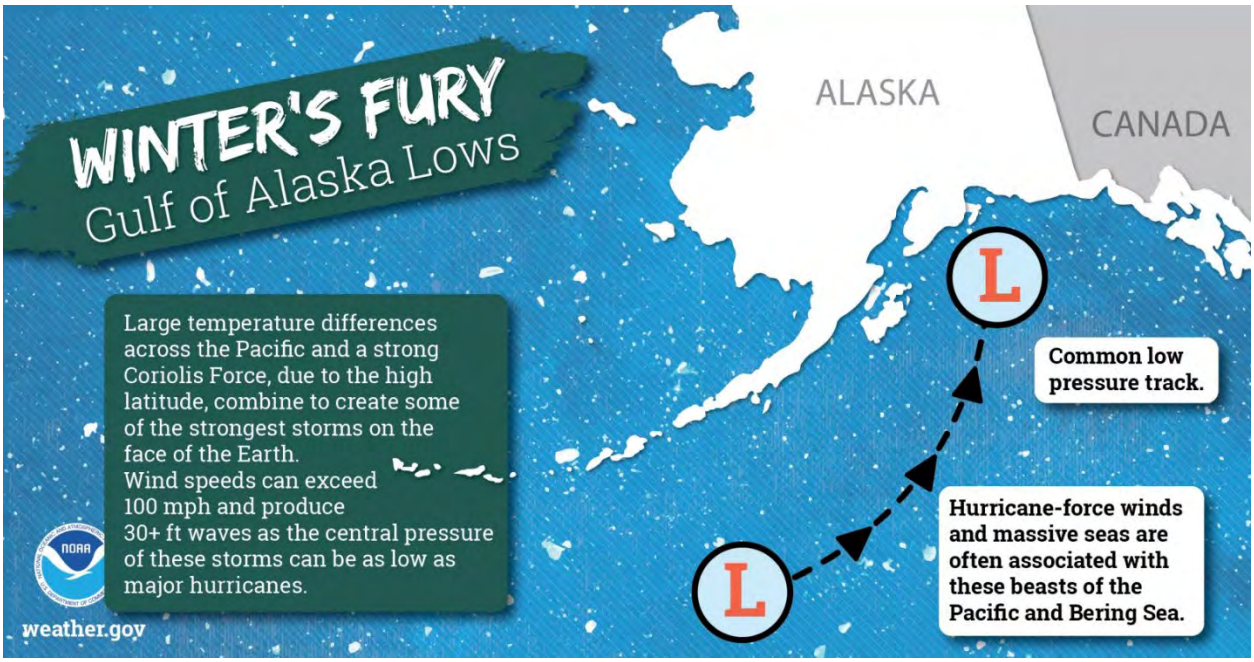



**Figure 18- Depiction of Storm Surge**

The Aleutians East Borough Planning Area is impacted by the Aleutian Low, which is a large, semi-permanent climatic feature centered near the Aleutian Islands. It is at its lowest pressure during the winter months, but its intensity and exact geographic extent vary over months and years (S.N. Rodionov et al.2007). Extra-tropical storms form off the Aleutian Low and are then driven westward by prevailing westerly winds, sending strong winds, heavy rains, and high seas toward the Alaskan coast (NOAA 2026).




Source: NWS 2019

**Figure 19- Location of the Aleutian Low**

Storm surge-water intrusion beyond the normal high tide line can be caused by the combined effects of wind, atmospheric pressure, rainfall, and tidal conditions. Strong winds from a storm push ocean water toward the shore, leading to an unusual rise in sea level. This effect is further amplified by the low atmospheric pressure associated with the storm, which allows the ocean surface to rise even more. Coastal geography plays a major role in the extent of the surge. Some areas see less of a rise than others, with surge levels being influenced by the slope of the continental shelf or the shape of the coastline. A shallow shelf typically results in a higher surge, while a steeper shelf reduces it.

A **king tide** is a non-scientific term people often use to describe exceptionally high tides. These exceptionally high tides are driven by the interaction between the moon, sun, and Earth's gravitational orbits. They normally occur during new or full moons (NOAA 2026).

**Snowmelt flooding** typically occurs from April through June but is most common in the spring when rapidly warming temperatures quickly melt snow. Snowpack depth, spring weather patterns, and geomorphic characteristics of the watershed influence the magnitude of flooding. Rainfall and high temperatures can exacerbate snowmelt floods. These floods occur when the major source of water involved is melting snow. Unlike rainfall, which can reach the soil almost immediately, snowpack can store water for an extended period until temperatures rise and the snow melts. Once it begins to melt, the water runs off, infiltrates the soil, or both. However, snowmelt typically happens before soil thaws and therefore water is generally considered to be surface runoff. This can result in a rapid rise in river discharge.

**Rainfall-runoff** flooding typically occurs in late summer through early fall. Rainfall intensity, duration, distribution, as well as pre-existing soil moisture conditions and geomorphic characteristics of the watershed all contribute to the flood's magnitude. These floods result from high rainfall amounts and accompanying high surface runoff rates.

**Flooding Terminology**

**Bankfull Stage:** An established gage height at a given location along a river or stream, above which a rise in water surface will cause the river or stream to overflow the lowest natural stream bank somewhere in the corresponding reach.

**Action Stage:** The stage which, when reached by a rising stream, represents the level where the NWS or a partner/user needs to take some type of mitigation action in preparation for possible significant hydrologic activity.

**Flood Stage:** An established gage height for a given location above which a rise in water surface level begins to create a hazard to lives, property, or commerce. The issuance of flood advisories or warnings is linked to flood stage.

**Minor Flooding:** Defined to have minimal or no property damage, but possibly some public threat. A **flood advisory** product is issued to advise the public of flood events that are expected not to exceed the minor flood category.

**Moderate Flooding:** Defined to have some inundation of structures and roads near the stream. Some evacuations of people and/or transfer of property to higher elevations may be necessary. A **flood warning** should be issued if moderate flooding is expected during the event.

**Major Flooding:** Defined to have extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations are necessary. A **flood warning** should be issued if major flooding is expected during the event.

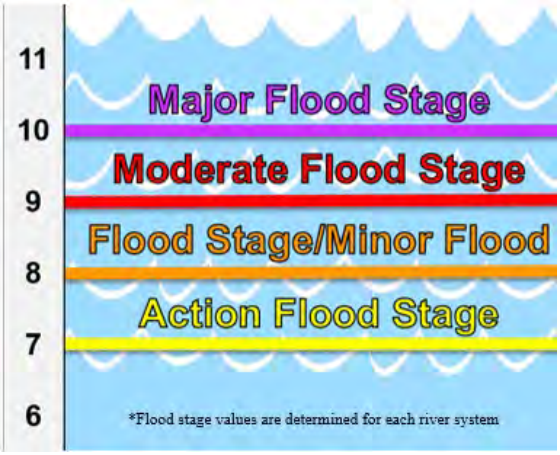



**Figure 20- Depiction of Flood Stages**

### 3.2.5.2 Location

The Aleutians East Borough Planning Area is located in southwestern Alaska along the eastern portion of the Aleutian Islands and the western Alaska Peninsula. The region extends across more than 15,000 square miles of volcanic islands, steep coastal terrain, and marine environments influenced by the Bering Sea to the north and the North Pacific Ocean to the south.

***The National Oceanic and Space Administration and the National Weather Service identify this region as one of the most weather-intense regions in the United States, where low-pressure systems routinely track across the Aleutians and generate coastal flooding, storm surge, and wave-driven inundation.***

These systems interact with coastal development and infrastructure, making the region particularly susceptible to flood hazards. Many Planning Area communities are situated directly along shorelines or on narrow spits, with limited developable land at higher elevations. These siting limitations increase exposure to coastal storms and flooding.

According to the 2023 State HMP, False Pass, Cold Bay, King Cove, Nelson Lagoon, and Akutan are within identified Coastal Flooding Hazard Areas (DHS&EM 2023). These areas were determined by using a 0.5-mile buffer along communities identified as threatened by coastal flooding and a 0.25-mile buffer along riverine threatened communities (DHS&EM 2023). For this Risk Assessment, coastal flood hazard areas were also assessed in Sand Point, Unga Village, and Pauloff Harbor Village.

While the State of Alaska identified coastal flood hazard areas in Cold Bay, the City of Cold Bay Planning Team did not select flooding as a hazard due to the community's terrain and elevation (100+ feet above sea level).

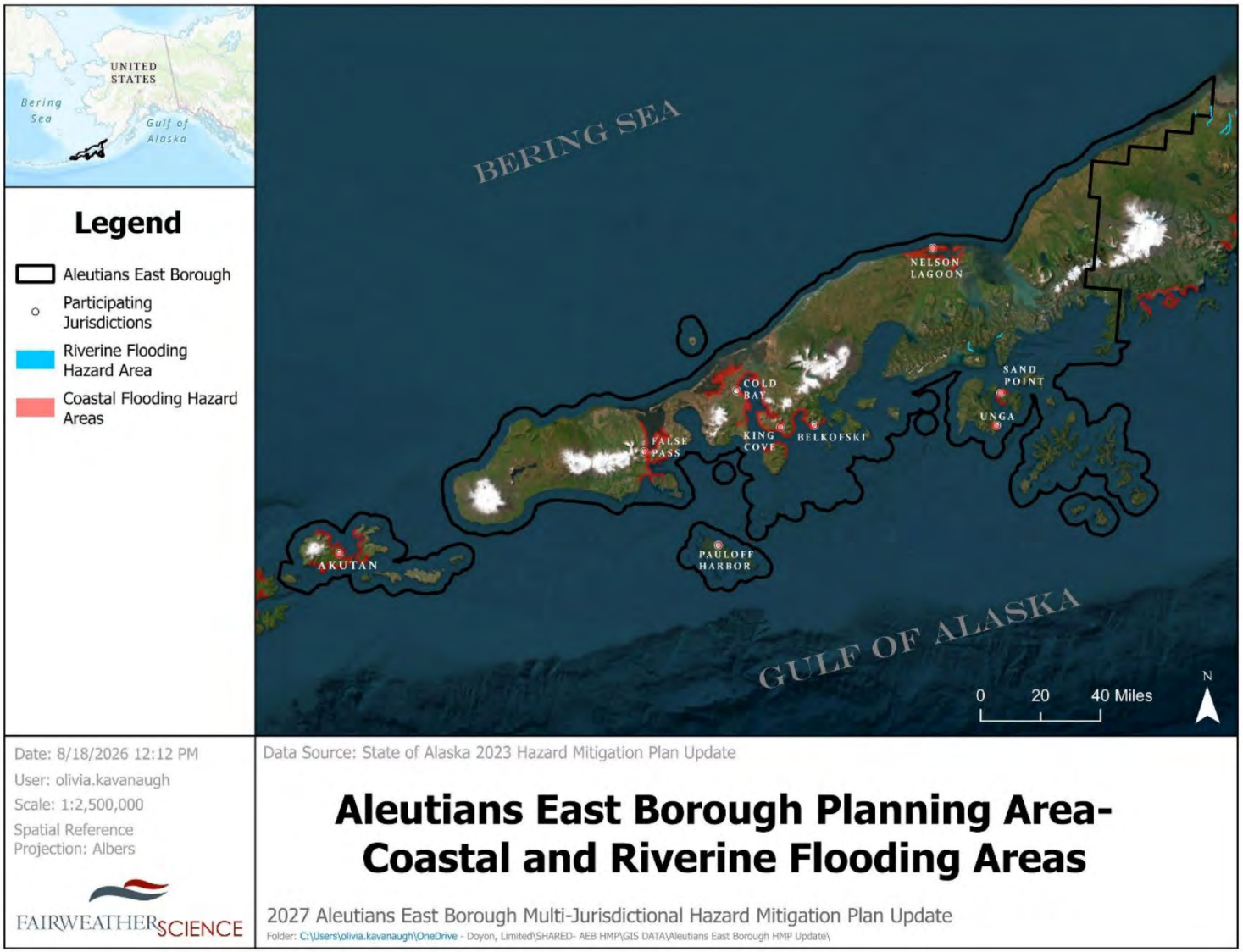



**Figure 21- AEB Coastal and Riverine Flooding Hazard Areas**

### 3.2.5.3 History

***There have been no federal or state disaster declarations related to flooding in the Aleutians East Borough Planning Area.***

The Alaska Water Level Watch houses water level data from multiple sources and is an extension of NOAA's National Water Level Observation Network. There are sensors located throughout the Aleutians East Borough Planning Area that measure sea level, tidal changes, storm surge events, and can be used to monitor long-term coastal trends. The closest sensors to communities in the Aleutians East Borough Planning Area are listed below.

**Table 11- Alaska Water Level Watch Sensors Closest to Planning Area Communities**

| Nearest Community | Sensor Location | Sensor Type |
|---|---|---|
| Nelson Lagoon | Port Heiden | NOAA – Tier A |
| Nelson Lagoon | Point Moller | NOAA – Tier A |
| Nelson Lagoon | Nelson Lagoon | UAF ACGL – Tier A |
| Sand Point | Sand Point | NOAA – Tier A |
| Sand Point | Zachary Bay, Unga Island | NOAA – Tier A |
| King Cove | King Cove | NOAA – Tier A |
| Cold Bay | Cold Bay | NOAA – Tier A |
| False Pass | False Pass | NOAA – Tier A |
| False Pass | Isanotski Strait Entrance | NOAA – Tier A |
| False Pass | Neumans Cove | NOAA – Tier A |
| Akutan | Akutan | NOAA – Tier A |

Source: AWLW 2026

An overlay of reported flood events in the database notes the following incidents:

**Table 12- Flood Events in Alaska Water Level Watch Database**

| Community | Date | Event Type | Flood Impact |
|---|---|---|---|
| King Cove | October 23, 1977 | Storm Surge | Pending Assessment |
| Nelson Lagoon | November 23, 2020 | Storm Surge | Pending Assessment |

Source: AWLW 2026

The City of Cold Bay's 2021 Local Hazard Mitigation Plan includes a heavy rain event in November of 2000 in which 4 inches of rain fell in 24 hours, causing classic urban drainage and small stream flooding (City of Cold Bay Local HMP, 2021).

**According to the Aleutians East Borough Planning Team, West Lagoon Rd in King Cove experiences annual flooding related to the King Tide. During the 2025 event, flooding cut off a portion of W Lagoon Rd, which resulted in 30-40 people unable to access or leave their homes.**



Source: AEB 2025

**Figure 22 – Flooding Along West Lagoon Rd in King Cove**

Table 15 lists major historical severe weather events for the Aleutians East Borough Planning Area. Within this list, only one event description includes flooding. This event occurred on January 6th, 2024. High winds were first observed in Dutch Harbor on the morning of Jan 6, with gusts in excess of 65 knots (75 mph). However, the highest gusts were observed in Akutan later in the afternoon. At 4:45 pm, the C-MAN station AKXA2 in Akutan measured a gust of 89 knots (102 mph). Winds then decreased through the evening hours. Additionally, the storm caused some damage, with a boat flooding due to the weight of the rain and snow and a breakwater which had been damaged previously receiving additional damage (NWS, 2026).

#### 3.2.5.4 Extent (Magnitude and Severity)

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. The following factors contribute to flooding frequency and severity:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Ice dynamics and glacier recession
- Snowmelt
- Atmospheric conditions
- Watershed conditions, including terrain steepness, soil types, amount, vegetation type, and development density.
- The existence of attenuating features in the watershed, including natural features such as lakes and human-built features such as dams.
- Flow velocity.
- Availability of sediment for transport, and the bed and embankment watercourse erodibility.
- Location of potentially impacted structures related to the base flood elevation as indicated with their certified high-water mark.

The following factors contribute to coastal flooding severity:

- Astronomical tides
- Storm surge – the rise in water from wind stress and low atmospheric pressure
- Inter-seismic and/or co-seismic land level changes
- Waves
- Peak still-water elevation

None of the jurisdictions included in this plan participate in the National Flood Insurance Program. They do not have FEMA Flood Insurance Rate Maps, and they have not undergone a FEMA Risk MAP project.

This region relies on the following for flood data and information:

- NOAA Water Level Watch sensors
- Local hydrology assessments
- USACE coastal studies
- NOAA coastal inundation models
- Erosion and storm surge hazard data

The 2019 Denali Commission *Statewide Threat Assessment: Identification of Threats from Erosion, Flooding, and Thawing Permafrost in Remote Alaska Communities* identified False Pass and Nelson Lagoon as “threatened” communities based on the results of the USACE’s Alaska Baseline Erosion Assessment, completed in 2009 (Denali Commission 2019).

The Denali Commission’s Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest has the lowest vulnerability (Denali Commission 2019).

Of these 187 communities, Nelson Lagoon received a combined (erosion, flooding, and thawing permafrost) community ranking of 58, and False Pass received a community ranking of 75. Some communities received the same ranking, indicating equal threat rankings.

A closer examination of the individual threat ranking for flooding shows Nelson Lagoon and False Pass ranking 55th and 56th overall, respectively (Denali Commission 2019). While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking. See Table 13 below for a list of flood threat rankings in the report.

**Table 13- 2019 Denali Commission Statewide Threat Assessment Flood Threat Rankings, with a Higher Ranking Indicating Lower Vulnerability**

| Community | Flood Threat Ranking |
|---|---|
| Akutan | Tied for 59 out of 63 |
| False Pass | 56 out of 63 |
| King Cove | Tied for 59 out of 63 |
| Nelson Lagoon | 55 out of 63 |
| Sand Point | Tied for 59 out of 63 |

Source: Denali Commission 2019

Floods in False Pass are a result of the 100-year discharge for the unnamed creek known locally as Round Top Creek. Past events have required the use of heavy equipment to divert flooding from the creek to an adjacent stream. The highest remembered flows in Round Top Creek occurred in the fall of 1963, December 1984, and November 1985. The flood of 1963 eroded through the middle of the newly constructed runway, but no reports of water entering the community were reported.

Flood duration is highly variable and dependent on many factors. Duration can range from several hours to several days (DHS&EM 2023).

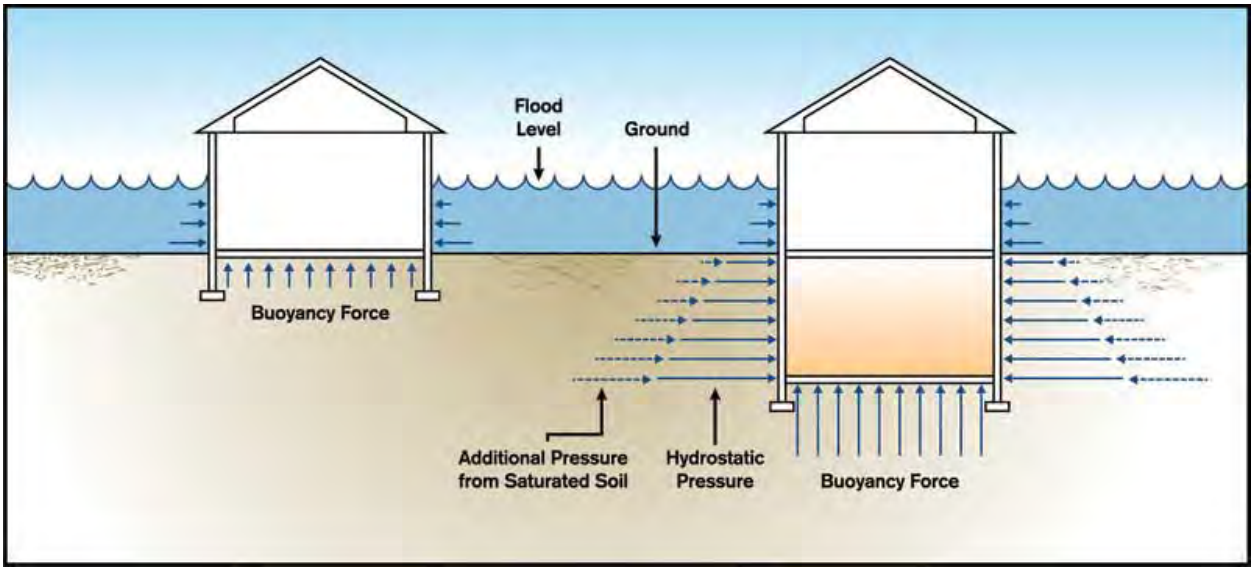
Estimating the extent of flooding throughout the Aleutians East Borough Planning Area is difficult due to a lack of data. However, these coastal communities tend to experience flooding when strong low-pressure systems generate storm surge, wave runup, and coastal inundation. Storm surge is often 1 to 4 feet and can be higher (5 to 7 feet) in severe events. Wave runup averages 8 to 15 feet and can exceed 20 feet during intense storms. Coastal inundation generally extends tens to hundreds of feet inland and is highly dependent on elevation, bathymetry, shoreline configuration, and local flood protection infrastructure. Low-lying areas and harbor infrastructure are usually the first to be impacted by flooding.

Based on past severe weather events and the criteria identified in Table 4, the extent (magnitude and severity) of flooding in the Aleutians East Borough is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### 3.2.5.5 Impact

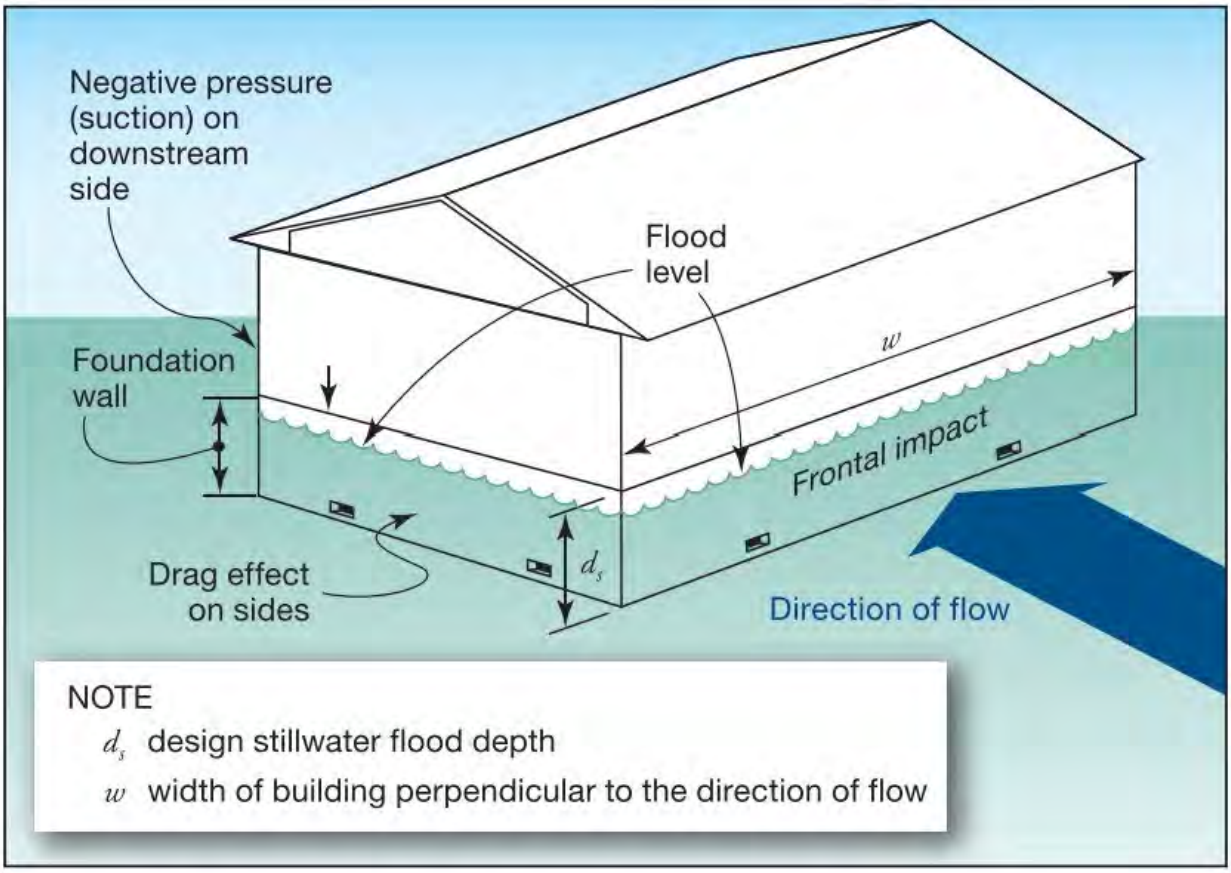
**Property and Structure Damage**

When discussing damage from water inundation, it's important to distinguish the difference between hydrostatic and hydrodynamic force in the context of flooding. Hydrostatic force is the pressure exerted by standing water, and hydrodynamic force is the force exerted by moving water. Both forces can cause substantial damage to a structure through various forms of pressure. Figure 23 and Figure 24 illustrate these two types of forces.




Source: CSI 2015

**Figure 23- Hydrostatic Force on a Structure**




Source: BASC 2025

**Figure 24- Hydrodynamic Force on a Structure**

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/ Land | Flooding can cause shoreline loss, land destabilization, sediment transport and scouring of stream banks and coastal embankments, roadway embankments, foundations, footings for bridge piers, and other features.<br><br>Stream bank land destabilization involves the removal of material from the stream bank. When bank land destabilization is excessive, it becomes a concern because it results in loss of streamside vegetation, loss of fish habitat, and loss of land and property. High water flow storm surge floods scour (erode) coastal embankments, coastal protection barriers, and result in infrastructure and residential property losses. Additional impacts can include roadway embankment collapse and foundation exposure, and damaging impacts. Deposition of moved material can impede waterways and threaten community infrastructure. |
| Infrastructure | Floodwater can cause damage to critical facilities, structures, roads, culverts, and other features from high-velocity flow and debris carried by floodwaters. Such debris may also accumulate in culverts, increasing loads on these features or causing overtopping or backwater damage.<br><br>Water inundation causes tremendous damage to homes and structures. Building materials become saturated with water and can swell, making doors and windows inoperable. Water-saturated building materials become much heavier than they would normally be, which can cause structural damage such as buckling and settling. Materials such as sheet rock can suck up water and lift it with a capillary-type action far above the original level of the flood water. |
| People | Nationwide, floods result in more deaths than any other natural hazard. Death and injury are potential impacts of severe flood events. Floodwaters can overtop roads, runways, and harbor infrastructure making transportation and emergency egress difficult or impossible.<br><br>Mildew and mold can quickly set in after a flood, destroying furnishings and causing a health hazard for those with allergies or respiratory conditions. Flood waters usually bring along large quantities of dirt and silt, which are left as deposits when the flood waters recede. Homes and possessions, if not excessively damaged by water, can be damaged by silt deposits.<br><br>Flooding in the low-lying portion of the communities could cut off portions of the community from critical services located out of the flood zone. For example, road closures, impacts to public safety (access and response capabilities), and limited availability of perishable commodities will impact even those properties not flooded. Because of this, while the actual area subject to flooding is limited, the impact of the flooding could affect the entire community.<br><br>Flood waters pose a health hazard by distributing contaminants and disease as they travel. Outhouses, fuel tanks, sewers, septic tanks, and livestock yards are all potential sources of disease transported by flood waters, especially if wastewater and sewage infrastructure sustain additional damages. Homes and possessions must be cleaned and sanitized after a flood and may be discarded when the damage is too extensive. Public water supplies can be contaminated by flood waters and must be tested to ensure their safety and potability. Private well systems must also be tested and disinfected after a flood.<br><br>Lack of a water source is a significant concern for flood victims, especially if the flood has been extensive enough to contaminate the public water supply. In such a case, outside bottled water is at times the only source of clean water. |

| | Description of Previous/Potential Impacts |
|---|---|
| Utilities | Inundation may cause damage to water and wastewater utilities, power, and communications infrastructure as well as roads, bridges, culverts, and other features.<br>Flooding can cause sewage and hazardous or toxic materials to be released and transported throughout a community. This can happen when wastewater treatment plants are inundated, storage tanks are damaged, or pipelines are severed.<br>Flooding and its resultant land destabilization or water damage can disrupt utilities for prolonged periods of time. |
| Transportation | Flood events can severely impact transportation systems by overtopping and inundating roadways, airstrips, marine transport infrastructure, and damaging vehicles, boats, ATVs, and other transportation methods. Low lying areas that become inundated can isolate certain parts of a community, impeding movement of people and emergency supplies. |
| Economy | Flood events can result in economic losses through business and government facility closure, communications, utility (such as water and sewer), and transportation service disruptions. Floods can result in large expenditures for emergency response and generally disrupt the normal function of a community. |
| Subsistence Resources | Flood events can impact landforms and ecosystems, potentially disrupting key subsistence species and access to subsistence areas. For example, deposition is the accumulation of soil, silt, and other particles on a river bottom or delta. Deposition can lead to the destruction of fish habitat and present a challenge for navigational purposes. Deposition also reduces channel capacity, resulting in increased flooding or land destabilization. River land destabilization and deposition together often lead to lateral stream movement.<br>Community-provided information also identifies flood-related impacts to traditional access and use areas that may not be represented in conventional building and infrastructure exposure data. These impacts are particularly relevant where continued access to historical village lands and traditional-use areas is important even in the absence of a permanent year-round population. |

#### 3.2.5.6 Probability of Future Events

The probability of flooding hazards in the Aleutians East Borough Planning Area varies. King tides, for example, are astronomical in nature and are impacted by local bathymetry and coastal features. Coastal flooding related to storm surge is a frequent hazard in coastal Alaska. This can be driven by intense low-pressure systems, in this case the “Aleutian Low”, where sub-polar cyclones reach their maximum intensity. Extra-tropical storms generated from this low-pressure system regularly move into prevailing westerly winds, then hitting Alaska with strong winds, heavy rains, and high seas (NOAA 2026). Rainfall flooding is generally driven by heavy rainfall events, while snowmelt flooding is generally driven by a combination of high snowfall/snowpack and rapid periods of warming. The probability of each of these flooding types varies.

**Storm Surge/Coastal Flooding** - Based on previous occurrences and the criteria identified in Table 5, it is **Likely** that the Aleutians East Borough Planning Area will experience an impactful storm surge/coastal flood event in the calendar year. There is a 1 in 3 years chance of occurring (1/3 = 33%), and the history of events is greater than 20% but less than or equal to 33% likely per year.

**King Tide** – Based on previous occurrences and the criteria identified in Table 5, it is **Possible** that the Aleutians East Borough Planning Area will experience an impactful king tide event in the calendar year. There is a 1 in 5 years chance of occurring (1/5 = 20%), and the history of flooding events is greater than 10% but less than or equal to 20% per year.

**Snowmelt Flooding** - Based on previous occurrences and the criteria identified in Table 5, it is **Possible** that the Aleutians East Borough Planning Area will experience a snowmelt flooding event in the calendar

year. There is a 1 in 5 years chance of occurring (1/5 = 20%), and the history of flooding events is greater than 10% but less than or equal to 20% per year.

**Rainfall Run-off Flooding** - Based on previous occurrences and the criteria identified in Table 5, it is **Possible** that the Aleutians East Borough Planning Area will experience an impactful rainfall flood event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

**Overall Flooding** - Based on previous occurrences and the criteria identified in Table 5, it is **Likely** that the Aleutians East Borough Planning Area will experience a flood event in the calendar year. There is a 1 in 3 years chance of occurring (1/3 = 33%), and the history of events is greater than 20% but less than or equal to 33% likely per year.

Gathering data on flood frequency in Alaska is difficult due to sparce monitoring networks along the coastline and across river systems. It is recommended to have 10 years of peak-flow data to properly develop a flood frequency analysis for rivers and streams. Based on historic events, it is anticipated that those locations throughout the state that are already vulnerable to flooding will flood with similar to more frequency in the future (DHS&EM 2023).

#### 3.2.5.7 Future Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in the Aleutians East Borough Planning Area as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA 2021).<br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in the Aleutians East Borough Planning Area is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in the Aleutians East Borough Planning Area, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in the Aleutians East Borough Planning Area. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (Climate Central 2015).<br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood |

| Description of Future Conditions | |
|---|---|
| | (Ranasinghe et al. 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al. 2021).<br><br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in the Aleutians East Borough Planning Area, however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper, B. et al. 2021). |
| Population Patterns | It is possible that future flood events will cause changes in population patterns in the Aleutians East Borough Planning Area as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

## 3.2.6 Ground Failure/Landslide

This section focuses on ground failure in terms of landslides- both subaerial (on land), and submarine (underwater). See Section 3.2.2 for information on snow avalanches.

### 3.2.6.1 Nature

Landslide is a generic term for a variety of downslope movements of earth material under the influence of gravity. Landslides occur naturally when inherent weaknesses in the rock or soil combine with one or more triggering events such as heavy rain, snowmelt, changes in groundwater level, and seismic or volcanic activity.

Some landslides occur rapidly, in mere seconds, while others might take weeks or longer to develop. Landslides usually occur in steep areas. Changing drainage patterns, groundwater level, slope and surface water (for example the addition of water to a slope from agricultural or landscape irrigation), roof downspouts, septic- tank effluent, or broken water or sewer lines can also cause landslides. Removal of vegetation from steep slopes can erode the integrity of the ground and lead to landslides.

**Subaerial landslides** occur above water and are the easiest to visualize. These landslides are most often caused by steep slopes rising directly out of the water, rapid land destabilization caused by glacial retreat or calving, heavy rains in coastal areas, frequent earthquakes, or volcanic eruptions (AEC 2020).

**Submarine landslides** occur underwater. The most common trigger of submarine landslides is slope over-steepening due to high rates of sediments being deposited on already steep slopes (AEC 2020). Other triggering factors include earthquakes, large tidal ranges that can expose unstable sediments and weaken their hold on the slope, construction activities (blasting, dredging) in coastal areas, or some combination of these (AEC 2020).

Three main factors influence landslides: topography, geology, and precipitation. Topography and geology are associated with each other; the steeper the slope, the greater the influence from gravity. Rock strength is important as certain bedrock formations or rock types appear to be more prone than others to landslides. Precipitation may erode and undermine slope surfaces. If precipitation is absorbed into the ground, it increases the pore water pressure and lubricates weak zones of rock or soil.

Additionally, landslides often occur secondary to other natural hazard events, thereby exacerbating conditions, such as:

- **Earthquake** ground movement can trigger events ranging from rock falls and topples to massive slides.
- Intense or prolonged **precipitation** can cause slope over-saturation and subsequent destabilization failures such as landslides.
- **Drought** conditions may increase wildfire conditions where a **wildland fire** consumes essential stabilizing vegetation from hillsides significantly increasing runoff and ground failure potential.

The USGS identifies six landslide types, distinguished by material type and movement mechanism including:

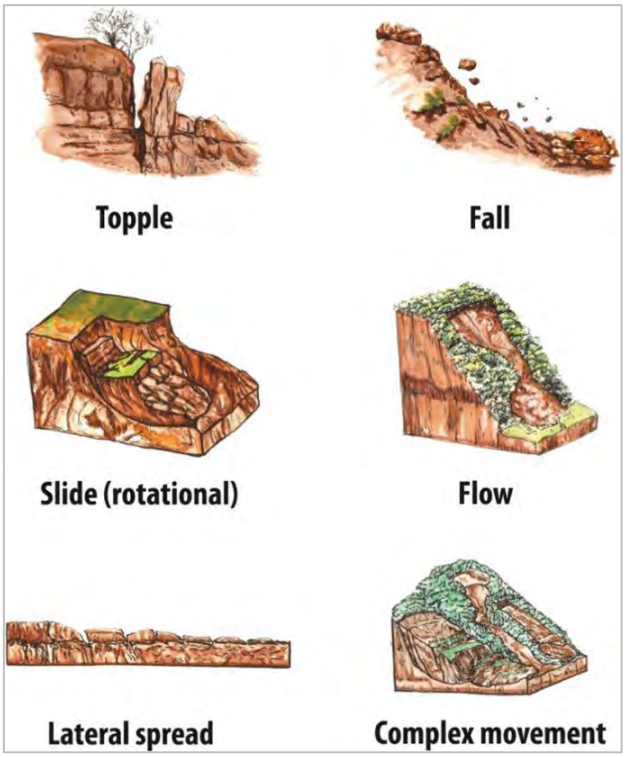
1. **Slides** are characterized by shear displacement along one or several surfaces. There are two general types of slides.
   - **A. Rotational slide**, the rupture surface is concave upward, and the mass rotates along the concave shear surface. Rotational slides, also called slumps, can occur in bedrock, debris, or earth.
   - **B. Translational slide**, the rupture surface is a smooth or gently rolling slope. In bedrock and earth, translational slides are sometimes called block slides if an intact mass slides down the slope. If rock fragments or debris slide down a slope on a distinct shear plane, the movements are called rockslides or debris slides.
2. **Flows** are a moving mass that has differential internal movements that are distributed throughout the mass. They differ from slides by their higher water content and the distribution of velocities that resemble a viscous fluid. There are five basic categories of flows.

**A. Debris Flow**: is a form of rapid mass movement combining loose rock, soil, organic matter, and water to create a slurry that mobilizes downslope. Debris flows are commonly caused by intense surface-water flow, due to heavy precipitation and rapid snowmelt, that erodes and mobilizes loose soil or rock on steep slopes. Debris flows also commonly mobilize from other types of landslides that occur on steep slopes, are nearly saturated, and consist of a large proportion of silt and sand-sized material. Debris-flow source areas are often associated with steep gullies, and debris-flow deposits are usually indicated by the presence of debris fans at the mouth of gullies. Fires that scald slopes of vegetation intensify the susceptibly of slopes to debris flows. Debris flows typically occur on slopes in the 20–45-degree range.

**B. Debris Avalanche**: is a variety of very rapid to extremely rapid debris flow. Typically, debris avalanches occur between 10-25 miles per hour, but speeds more than 100 miles per hour have occurred in the past.

**C. Earthflow**: are characterized by an "hourglass" shape. The slope material liquifies and runs out, forming a bowl or depression at the head. The flow itself is elongated and usually occurs in fine-grained materials or clay-bearing rocks on moderate slopes and under saturated conditions. However, dry flows of granular material are also possible.

**D. Mudflow**: A mudflow is an earthflow consisting of material that is wet enough to flow rapidly and that contains at least 50 percent sand-, silt-, and clay-sized particles. In some instances, for example in many newspaper reports, mudflows and debris flows are commonly referred to.




Source: USGS 2026

**Figure 25- Landslide Types**

**E. Creep**: Creep is the imperceptibly slow, steady, downward movement of slope-forming soil or rock. Movement is caused by shear stress sufficient to produce permanent deformation, but too small to produce shear failure. Creep is indicated by curved tree trunks, bent fences or retaining walls, tilted poles or fences, and small soil ripples or ridges. There are generally three types of creeps.

- *Seasonal*, where movement is within the depth of soil affected by seasonal changes in soil moisture and soil temperature.
- *Continuous*, where shear stress continuously exceeds the strength of the material.
- *Progressive*, where slopes are gradually reaching the point of failure under the influence of gravity.

3. **Lateral Spreads** involve the horizontal displacement of the surface. They often occur on gentle slopes that range between 0.3 degrees and 3 degrees. Lateral spreads can occur in rock, but this process is not well documented, and movement rates can be quite slow. They are more common in fine-grained soils, such as clay, especially if the soil has been remodeled or disturbed by construction, grading or similar activities. Loose granular soils commonly produce lateral spreads through liquefaction (where saturated soils are transformed from a solid into a liquefied state). Liquefaction can occur spontaneously because of changes in pore-water pressure or in response to vibrations such as those produced by seismic activity. Lateral spreads typically damage pipelines, utilities, bridges, and other structures having shallow foundations.

4. **Falls** occur when masses of rock or other material detach from a cliff or other steep slope and move downhill by free fall, rolling or bouncing. The movement is very quick. The typical slope angle involved is from 45 to 90 degrees. Rock falls occur when a rock on a steep slope becomes dislodged and falls down the slope. A rock fall may be a single rock, or a mass of rocks and the falling rocks can dislodge other rocks as they collide with the cliff. At the base of most cliffs is an accumulation of fallen material termed talus. Rock falls are a constant hazard along transportation routes through rocky terrain.
5. **Topples** are rocks and boulders that rotate forward and may become falls.
6. **Complex** is any combination of landslide types.

### 3.2.6.2 Location

The Aleutians East Borough Planning Area is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity.

Many landslide paths coincide with avalanche paths, especially at higher elevations. Unmapped areas within the Borough remain to be studied for landslide hazards and will be included in future updates of this plan as resources become available to evaluate those areas for landslide hazards. For specific mitigation actions, see Section 4.1.

The following describes conditions where landslides may occur:

| Hazard Designation | Hazard Attribute Description |
|---|---|
| Low (L) | • Gentle to moderate slopes (0-26 degrees)<br>• No signs of historical landslide activity on aerial photos<br>• No written record of property damage or loss of life |
| Moderate (M) | • Moderate to Moderately steep slopes (27-35 degrees)<br>• May be signs of historical activity (scars on trees, vegetated debris lobes or scarps, historical activity visible by aerial photos)<br>• Can include low lying areas within the runout zones of slides from nearby slopes<br>• No apparent written record of property damage or loss of life |
| High (H) | • Steep slopes (>35 degrees)<br>• Areas where rockfall activity impacts individual trees but does not knock them over or destroy them<br>• May have written record of property damage or loss of life |
| Severe (S) | • Steep to vertical slopes (>35 degrees)<br>• Signs of recent activity either in aerial photographs or from field inspection (rockfall tracks, debris slide activity, debris flow paths, etc.)<br>• May have written record of property damage or loss of life<br>• Signs repeated historical activity |

Source: TetraTech 2022

The Aleutians East Borough Planning Area has underwater locations that display signs of submarine landslides (USGS 2025b). Further research is needed to map more areas of the sea floor to determine past and potential future submarine landslides.

### 3.2.6.3 History

The Aleutians East Borough Planning Area has historically experienced landslides, both subaerial and submarine. See Figure 27 for locations of historically recorded subaerial landslides in the Aleutians East Borough Planning Area.

There are at least 112 recorded historical subaerial landslide events in Planning Area (AKDNR 2026). Eight (8) of these are classified as flows (2 debris flows, 3 soil flows, and 3 earth flows), and the remaining 104 are classified as slides.

1946

The April 1st, 1946, an earthquake near Unimak Island (approximately 42 m east of Akutan, 35 miles west of Cold Bay and 45 miles east of King Cove) created a tsunami wave that reached all the way to Antarctica. For years, speculation existed that the large tsunami was aided by a submarine landslide due to the disproportionate waves created by the earthquake. In 1996, the USGS GLORIA discovered numerous slope failures (historic submarine landslides) along the eastern Aleutian Shelf. An exceptionally large failure was found at the location of the now named Ugamak Slide (Fryer, Watts, Patson 2004). The Ugamak Slide consists of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

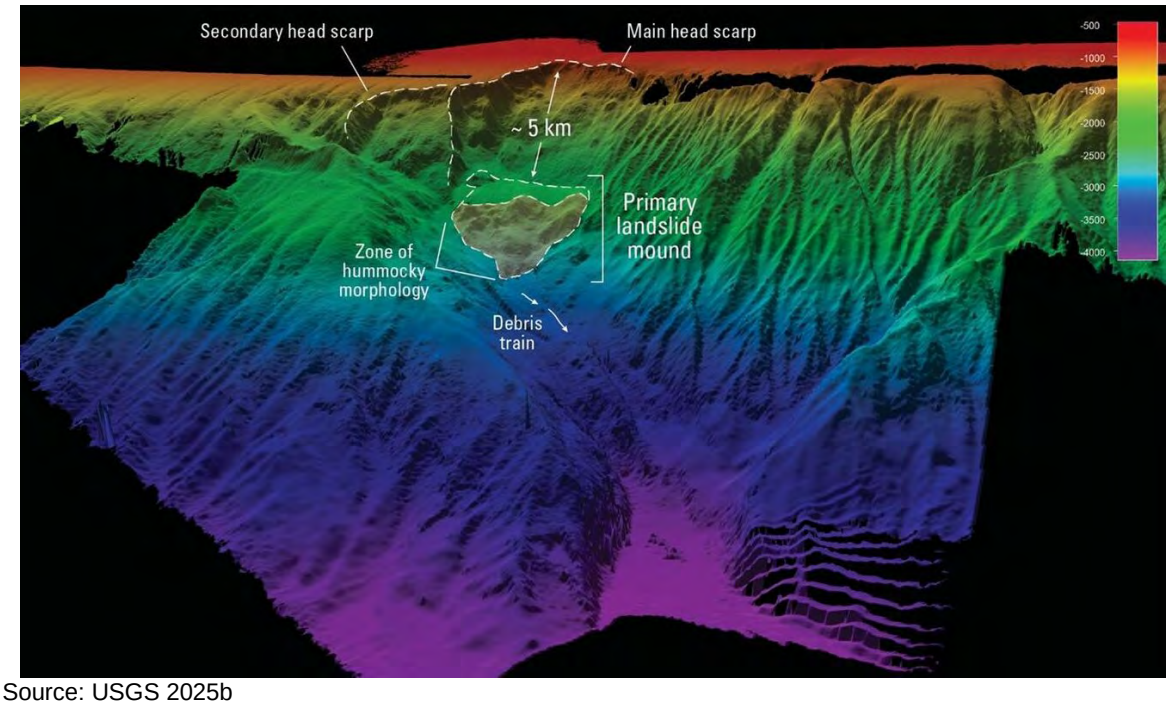
If the Ugamak Slide did indeed occur on April 1st, 1946, it is likely that much of the seismic motion, especially at longer periods, was from the slide itself. A tectonic shock – a shallow subduction earthquake – was probably the trigger but differentiating it from the rest of the motion may prove impossible. The evidence for a landslide source to the 1946 tsunami is substantial (Fryer, Watts, Patson 2004).

1957

In June 2025, United States Geological Survey (USGS), Bureau of Ocean Energy Management (BOEM), National Oceanic and Atmospheric Administration (NOAA), the Smithsonian, and the Woods Hole Oceanographic Institution, explored over 2,200 miles of the Alaska- Aleutian Megathrust. The mission used a human-occupied vehicle (HOV) with a focus on understanding how tectonic activity, submarine volcanoes, and deep-sea ecosystems interact to shape geologic hazards.

One of the most significant discoveries of the entire project was a massive submarine landslide structure on the Southern slope of the Aleutian shelf, and 10 miles northwest of the 1957 Andreanof Islands earthquake. The landslide spans over 10 miles across and exhibits well known signs of rapid slope failure – a scalloped headwall, a chaotic debris zone, and long runout lobes descending towards a deeper basin (USGS 2025b).

Seismic and tsunami models have raised questions if the destruction caused by the 1957 tsunami was generated not only by the Andreanof Islands earthquake, but also by a submarine landslide. Further study is needed to determine the slide's precise age and volume, but its scale, location, and alignment with tsunami deposits preserved locally in Hawaiian and Aleutian Islands make a compelling candidate to be involved in the 1957 earthquake and tsunami (USGS 2025b).




Source: USGS 2025b

**Figure 26 - 3D Rendering of 1957 Andreanof Islands Earthquake Submarine Landslide**



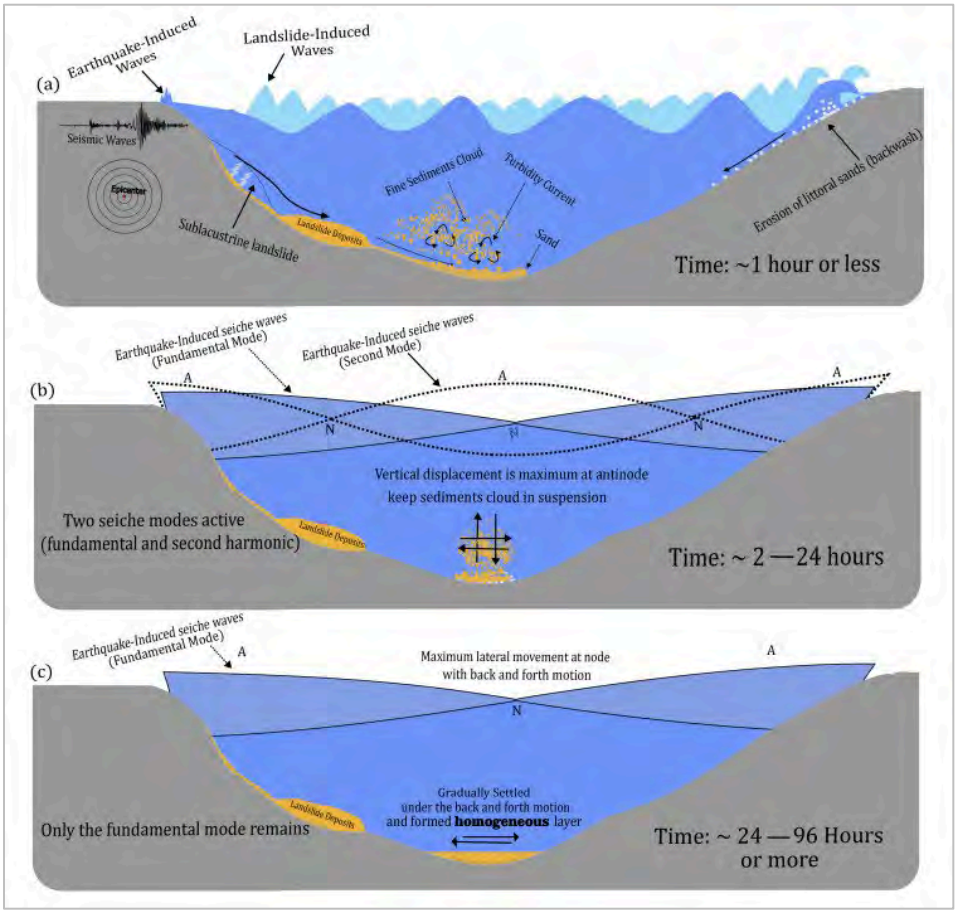

**Figure 27- Historical Landslide Events in the AEB Planning Area**

### 3.2.6.4 Extent (Magnitude and Severity)

Damage from ground failure or landslides ranges from minor with minimal repairs required to a massive economic impact with the possible destruction of critical community infrastructure and potential loss of human life.

Subaerial landslides on sloped terrain in the Aleutians East Borough Planning Area pose a threat to critical facilities or human life. Subaerial landslides near bodies of water also pose a threat to critical facilities or human life in the Aleutians East Borough Planning Area as they may trigger a tsunami or seiche.

Ongoing monitoring and modelling of these areas is needed to identify if future subaerial landslides have the potential to trigger a tsunami. More information about tsunamis and seiches can be found in Section 3.2.10.




Source: Science Direct 2025

**Figure 28 – Landslide Induced Seiche Visualization**

Subaerial landslides in the Aleutians East Borough Planning Area have displayed large magnitudes and severity in the past, in the form of debris flows and flooding caused by debris dams. Limited reporting makes quantifying volumes of earth moved by landslides difficult. Based on the Alaska Landslide Inventory Database, it can be estimated that the historical landslides recorded in the Aleutians East Borough Planning Area range in width of less than 100 feet to over 500 feet. Local knowledge and community observations provide an additional source of information regarding landslide occurrence and slope instability in areas where formal hazard inventories or detailed mapping are limited.

Subaerial landslides can cause secondary effects depending on their extent, including rerouting waterways and water runoff, increased land destabilization, seiches, and flooding.

**A landslide (both submarine and subaerial) has the ability to trigger a tsunami.** Due to the Aleutians East Borough Planning Area's location between the Bering Sea and the Pacific Ocean, and exposure to the open ocean, a submarine landslide-induced tsunami affecting the Aleutians East Borough Planning Area in the future is a possibility. In the past, submarine landslides created secondary hazards (tsunamis), that have impacted the Aleutians East Borough Planning Area. The Ugamak Submarine Slide consisted of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

Based on available data and modelling, historical events, and the criteria identified in Table 4, the magnitude and severity of landslides and resultant damages to people and infrastructure in the Aleutians East Borough Planning Area is considered to be **Critical**, with the potential for multiple deaths, complete shutdown of facilities for 30 or more days, and more than 50% of property is severely damaged.

#### 3.2.6.5 Impact

Impacts associated with landslides may include tsunamis/seiches, surface subsidence, infrastructure/ building and/or road damage, and potential human injury or death.

Landslides are often associated with other hazards. For example, a landslide may occur during floods because both involve precipitation, runoff, and ground saturation. Landslides are also often associated with seismic and volcanic events. Some of the costliest landslides in American history were caused by the 1964 Good Friday earthquake. It has been estimated that ground failure caused about 60% of the damage (NOAA 2017).

The secondary effects of landslides can also be very destructive. Landslide-caused dams cause damage upstream due to flooding and downstream due to a flood which may develop because of a sudden dam break. Landslides can also cause tsunamis and seiches when slide material slides into a lake or sea, displacing large amounts of water.

Areas most vulnerable are deep bays and inlets adjacent to steep slopes. In these semi-enclosed basins, the water can oscillate to create a large wave, called a seiche, which can impact the shorelines several times before dissipating.

Subaerial landslides on mountains in the Aleutians East Borough Planning Area have not formally been reported to impact critical facilities or residences in the Aleutians East Borough Planning Area. The 1960 avalanche that resulted in six fatalities was described as referencing rock and debris. Some jurisdictions may experience landslide impacts in the future. Landslides may affect subsistence resources and access to subsistence areas by damaging or obstructing trails, shorelines, waterways, harvesting areas, or other access routes. Jurisdiction-specific information regarding locally observed impacts is provided in the applicable jurisdictional annexes.

A submarine landslide induced a tsunami in 1946 which struck across the Aleutians. In Scotch Cap, Unimak Island, the Coast Guard Station was inundated, the light house was destroyed, and 5 individuals perished.

The 1956 tsunami was at least partially generated by a submarine landslide. The tsunami impacted boat harbors, coastal infrastructure, and other low-lying facilities to varying extents.

It is possible that submarine landslides have impacted ground fish populations, but this topic requires further study.

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | Landslides can transport not only soil and rock, but also trees and other debris, permanently changing the character of hillsides and the areas beneath them. |
| Infrastructure | Landslides can bury and/or destroy infrastructure and damage homes. |
| People | Large landslides have the potential to kill people and wildlife.<br>**Deaths reported from avalanches in the Aleutian Islands occurred in 1960 in King Cove.** In this incident, five children and one adult were killed after an avalanche hit their home. In a news article reporting this event, the deaths are attributed to exposure after a house was blown apart by high winds during a |

| | Description of Previous/Potential Impacts |
|---|---|
| | snowstorm. Local reports say that it was due to an avalanche that also reference soil and rock debris. |
| Utilities | Landslides can threaten fuel and supply storage areas, electricity infrastructure, and other utilities. |
| Transportation | Landslides can block roads and interrupt access to harbors that are essential for transportation. Limited evacuation routes and the remote nature of many Aleutian communities, who are subject to weather-dependent air and water-based transit, increase the consequence of hazard events including landslides. |
| Economy | The economic impacts of landslides, from impeding traffic to removing landslide debris blocking transportation corridors, can be significant at the local and state levels. |
| Subsistence Resources | Subsistence areas, equipment, and harvests can be damaged if they are in the path of a destructive landslide. |

#### 3.2.6.6 Probability of Future Events

Historically, the largest and most destructive landslides have been associated with more than 1.5 inches of rain in a 24-hour period. Precipitation records indicate that precipitation intensities of 2.0 inches in 24 hours can be expected at return periods of 5-10 years. Therefore, the conditions necessary for production of large landslides continue to prevail today even though major, destructive landslides do not occur frequently. Although the probability for ground failure is location-specific, the probability is likely, and increasing, due to future climate events (DHS&EM 2023).

Based on previous occurrences and the criteria identified in Table 5, it is **Likely** that the Aleutians East Borough Planning Area will experience a landslide event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### 3.2.6.7 Future Conditions

| | Description of Future Conditions |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of landslides in the future. |
| Location | It is possible that future climate conditions will influence the location of future landslides in the Aleutians East Borough Planning Area. Landslide probability is location specific, and numerous variables must be considered. It is common for debris flows to recur in the same channel or to shift slightly. Other types of landslides may reoccur in the same place or the area directly adjacent to a previous landslide. The Aleutians East Borough Planning Area is in a highly seismic area, which can trigger landslides at any time, and create areas prone to landslides that did not used to be.<br>Ground failures related to more frequent severe weather events, an increase in atmospheric rivers, and potential droughts are expected to appear in locations that were previously frozen and are now thawing. This includes areas that are immediately adjacent to recently thawed ground and where overlying vegetation has been removed. However, landslides also occur in areas with no prior known instabilities due to changing conditions such as increased rainfall, strong earthquake shaking, and human activities (DHS&EM 2023). |
| Extent (Magnitude and Severity) | It is likely that future climate conditions will influence the magnitude of future landslides in the Aleutians East Borough Planning Area. Landslides are expected to increase in magnitude with increased areas of effect as severe weather events increase in frequency (IPCC 2019). |

| Description of Future Conditions | |
|---|---|
| | Future climate conditions are expected to increase landslide frequency of all intensities, and as people develop across the landscape, including into hazardous areas, there will likely be an increase in more significant outcomes in the future (DHS&EM 2023). |
| Impact | It is likely that future climate conditions will influence the impact of future landslides in the Aleutians East Borough Planning Area. Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from an increase in atmospheric rivers, severe weather events, and glacial decline (IPCC 2019), which could increase future ground failure events and resultant impacts. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of future landslides in the Aleutians East Borough Planning Area. Although the probability of ground failure is location-specific, it is likely, and increasing, due to a changing climate. Severe weather events such as precipitation and wind are a direct result of atmospheric warming. Atmospheric rivers are becoming increasingly common and increase the intensity and duration of precipitation events at regional and local scales. Landslide events are directly related to high intensity precipitation events, and those are likely to become more common over greater geographic regions of Alaska (DHS&EM 2023). |
| Population Patterns | It is possible future climate conditions will influence population patterns in the Aleutians East Borough Planning Area. The Aleutians East Borough Planning Area is experiencing a slight increase in population as an overall trend. Since 2020, the population has increased 1.8%, from 3,419 to 3,479 (US Census 2026). This may eventually mean more of the resident population living in landslide hazard areas, however an increased growing season due to future climate conditions could lengthen the tourist season. An increase in tourists throughout the year could possibly increase the number of people that are at risk of landslide hazards at any given moment. |
| Land Use Development | It is possible future climate conditions will influence future land use development in the Aleutians East Borough Planning Area. Limiting development and relocating existing development outside of landslide hazard areas would change the development in these areas. A landslide warning system could require infrastructure development, and more development outside of the landslide zones could increase land use to accommodate displaced residents. It is also possible that land developed in the future, or that has already been developed, may eventually become prone to landslide hazards. |
| Subsistence Resources | It is possible that future climate conditions will result in landslides impacting subsistence resources. Landslides could wipe out land access to certain parts of coastline, berry gathering locations, or trails leading to hunting or fishing grounds. |

## 3.2.7 Invasive Species

### 3.2.7.1 Nature

**An invasive species is defined as a species that is nonnative to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health** (ADFG 2026). Not all non-native species are necessarily considered invasive. A nonnative species becomes invasive when its biological mechanisms such as natural predators or diseases are missing in its new environment. This biological imbalance allows the invading species to drastically change the biodiversity of the local ecosystem.

Due to the geographic isolation of Alaska from the Contiguous United States, it's a common misunderstanding that the state is largely free of invasive species (USDA 2025). Due to the overall expansive nature of Alaska, the status and overall category of invasive species vary greatly throughout the state. For this reason, this profile will focus on the categories of invasive species that are relevant to the Aleutians East Borough Planning Area.

***The categories of invasive species that currently pose the greatest risk to the Aleutians East Borough Planning Area are terrestrial plants, aquatic animals, and terrestrial animals.***

**Invasive Terrestrial Plants:**

There have been over 340 species of invasive plants that have been reported in Alaska, all with a varying level of invasiveness (USDA 2025). The University of Alaska Anchorage (UAA) created an invasive plant ranking system, which ranks an invasive plant on a scale from 0 to 100 based on species' ecological impacts, distributions, and other biological factors (USDA 2008). There are several species of invasive plants reported in the Aleutians East Borough Planning Area with a high ranking of invasiveness, including Orange Hawkweed and Oxeye Daisy.

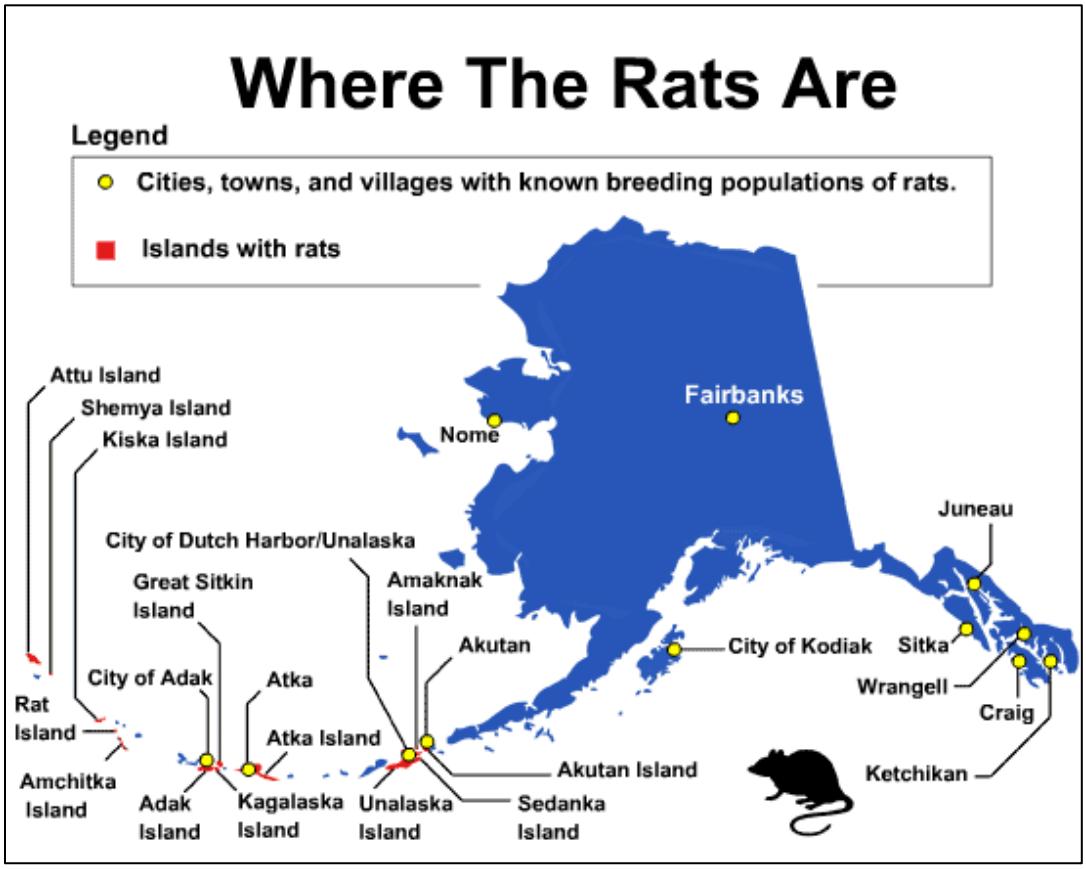
The primary mechanism for invasive plants to spread in Alaska is through human-aided pathways. Significant human sources of introduction of invasive species include contaminated cargo shipments arriving by air, land, or sea, and projects that can inadvertently carry seeds or spores from one place to another (ADFG 2026).

**Invasive Aquatic Animals:**

Invasive aquatic species can cause significant damage to Alaska's fisheries and marine mammals by altering local ecosystems and outcompeting native species. These types of invasive species primarily are incidentally introduced by attaching to the hull of shipping vessels (NOAA 2023). While there are no established populations of aquatic invasive species in the Aleutians East Borough Planning Area, recent detections of the invasive green crab in other regions of Alaska highlight the need for strategies to prevent these species from entering the Aleutians East Borough Planning Area's waters.

**Invasive Terrestrial Animals:**

The number of invasive terrestrial animal infestations in Alaska is relatively limited compared to terrestrial plants, but there is one species that is particularly of concern in the Aleutians East Borough Planning Area. The Norway Rat, commonly referred to as an invasive rat, is a species that has historically populated islands along the Aleutian chain (ADFG 2020). The presence of these rats historically caused significant damage to native bird habitat, which led to many islands engaging in an aggressive eradication effort. Figure 29 displays the distribution of invasive rats throughout Alaska.




Source: ADFG 2020

**Figure 29 – Alaska Invasive Rat Distribution**

**European Black Slug:**

The European Black Slug is a large invasive slug (up to 7-inches long) that is typically black in color. These slugs were first introduced in Cordova in the 1980s, but they started migrating to every island in Southeast Alaska in the early 2000s (UAF 2024). Reported throughout the Aleutian Islands and Alaska Peninsula in the last few years, these slugs are known to invade gardens and feed on locally grown produce. While the impacts to wild areas outside of gardens is widely unknown, slug infestations in the Aleutians East Borough Planning Area are becoming more prevalent because the cool, wet climate provides ideal habitat for slugs.



Source: ABSI 2026

**Figure 30- European Black Slug Found in King Cove**

### 3.2.7.2 Location

The location of the Aleutians East Borough Planning Area strongly influences the spread of invasive species because it serves as a gateway for marine transportation while its geographic isolation shapes how species are introduced, established, and dispersed. The Aleutians East Borough Planning Area receives heavy traffic from the Alaska Marine Highway System Southwest Alaska ferry, as well as from commercial fishing vessels and fuel tankers. Invasive species can be introduced through ballast water, cargo, or contaminated equipment associated with these vessels (AK DSPR 2026).




Source: AKDOT 2026

**Figure 31 – Southwest Alaska Ferry Route**

Despite the remoteness of each community in the Aleutians East Borough Planning Area, verified invasive plant infestations have been documented in every community except Nelson Lagoon. The absence of documented occurrences in Nelson Lagoon does not necessarily indicate that invasive plants are absent; it just reflects the absence of verified records in the AKEPIC community database.

As indicated in Figure 29, the only community in the Aleutians East Borough Planning Area with a known population of invasive rats is Akutan. While the communities on the Alaska Peninsula have had less historical vessel traffic related to military operations, their location in a busy vessel route ensures that the entire Planning Area remains vulnerable to future introductions.

No major established invasive aquatic animal populations have been documented within the Aleutians East Borough Planning Area to date. However, ongoing vessel traffic, commercial fishing activity, and connections to other Alaska ports provide continued pathways for the introduction and spread of these species. The presence of the invasive European Green Crab in Southeast Alaska represents an ongoing concern, as further range expansion into the Aleutian Islands and Alaska Peninsula could threaten native intertidal communities, alter food webs, and impact commercially important fisheries.

While there have been reports of European Black Slugs being found throughout several communities in the Aleutians East Borough Planning Area, the lack of a credible database and reporting system makes it difficult to verify occurrences and assess distribution.

### 3.2.7.3 History

Since the extent of invasive species varies greatly for each community in the Aleutians East Borough Planning Area, the history of previous occurrences provides valuable insight into areas of higher risk and potential pathways of introduction.

**Invasive Terrestrial Plants:**

The Aleutians East Borough Planning Area has had historical vessel traffic related to the fishing and shipping industry, which is presumably the primary pathway for invasive species in the region. Due to the remote nature of the Aleutians East Borough Planning Area, invasive plant establishment has historically been limited compared to more developed areas of Alaska. The development of military infrastructure during World War II, followed by continued growth in commercial fishing, transportation, and community infrastructure, likely contributed to the introduction and spread of invasive terrestrial plants throughout the region. While surveys and reporting efforts have increased in recent decades, the full distribution and history of invasive plants within the Aleutians East Borough Planning Area remain uncertain due to the remoteness of communities and limited monitoring coverage.

**Invasive Terrestrial Animals:**

Invasive rats first arrived in the Aleutian Islands in the 1780s, where they escaped a Japanese shipwreck and were introduced on Rat Island (WS 2021). Since then, the species multiplied rapidly and eventually resulted in a population on almost every major island on the Aleutian Chain, including Akutan. While several islands successfully eradicated these rats, Akutan is still considered to have an established population of invasive Norway rats.

**Invasive Aquatic Animals:**

Historically, there have been no documented occurrences of established populations of invasive aquatic animals in the Aleutians East Borough Planning Area.

**European Black Slug:**

After first being introduced to Alaska in the 1980s, the European Black Slug slowly spread throughout the state's coastal communities via human transportation networks. Given that formal detection and sampling programs for this slug don't exist in Alaska, it's difficult to identify the extent of it's spread throughout the Aleutians East Borough Planning Area.

### 3.2.7.4 Extent (Magnitude and Severity)

When evaluating the magnitude and severity of invasive species within the Aleutians East Borough Planning Area, it is important to consider metrics that characterize the extent of each species' distribution and level of invasion.

**Invasive Terrestrial Plants:**

The Alaska Exotic Plants Information Clearinghouse (AKEPIC) is the primary statewide database for documenting the occurrence and distribution of non-native and invasive plant species in Alaska. For each documented occurrence of a non-native plant species, AKEPIC assigns it an overall invasiveness ranking from 0-100, with 0 being the least invasive and 100 being the most invasive. This ranking is based on the plant's ecological impacts, dispersal ability, overall distribution, and feasibility of control (ACCS 2008). The database also utilizes how many acres a particular infestation has spread, which provides a snapshot of the extent of invasive species in a specific location.

Table 14 provides a comprehensive list of the recorded non-native plant occurrences in the Aleutians East Borough Planning Area (AKEPIC 2026).

**Table 14 – Non-Native Plant Occurrences Within the AEB Planning Area**

| Invasive Plant Species | Total Infested Area (acres) | Invasiveness Ranking (0-100) |
|---|---|---|
| Tall Buttercup | 52.346 | 60 |
| Canada Thistle | 37.734 | 76 |
| Creeping Buttercup | 11.913 | 72 |
| Orange Hawkweed | 9.126 | 79 |
| Oxeye Daisy | 7.929 | 61 |
| Big Chickweed | 5.28 | 36 |
| Spreading Bluegrass Or Kentucky Bluegrass | 4.7 | 52 |
| Common Dandelion | 4.406 | 58 |
| Common Chickweed | 3.056 | 42 |
| Common Plantain | 2.455 | 44 |
| Common Velvetgrass | 1 | 56 |
| Annual Bluegrass | 0.4 | 46 |
| Common Sheep Sorrel | 0.246 | 51 |
| Smooth Brome | 0.12 | 62 |
| European Mountain Ash | 0.062 | 65 |
| White Clover | 0.011 | 59 |
| Meadow Hawkweed | 0.003 | 79 |
| Thymeleaf Speedwell | 0.002 | 36 |
| California Gilia | 0.001 | Unknown |
| Garden Rhubarb | 0.001 | Unknown |
| Italian Ryegrass | 0.001 | 41 |
| Lambsquarters | 0.001 | 37 |
| Red Clover | 0.001 | 53 |
| Timothy Grass | 0.001 | 54 |
| **Grand Total** | **140.795 acres** | **Maximum Ranking: 79** |

Source: AKEPIC 2026

**While invasive species are a concern for many communities, at this time, the presence of these species is not impacting critical facilities.**

**Invasive Terrestrial Animals:**

While there isn't substantial data regarding the extent of invasive rats in the Aleutians East Borough Planning Area, there is known to be 21 large islands in Alaska with a confirmed breeding population of invasive rats, including Akutan (USFWS 2020). Additionally, historical survey data reported that invasive rats have been reported in King Cove and Sand Point; however, neither community is currently believed to support a significant breeding population.

**Invasive Aquatic Animals:**

While invasive aquatic species like the European Green Crab have been routinely monitored for in King Cove and Cold Bay, there are currently no documented occurrences of these species within the Aleutians East Borough Planning Area (ADFG 2023).

**European Black Slugs:**

Invasive slugs are a concern throughout the Aleutians East Borough Planning Area, with King Cove being the only community in the Aleutians East Borough Planning Area with a documented invasive slug population. According to the Aleutian and Bering Sea Initiative (ABSI), during the annual King Cove Slug out in 2026, thousands of European Black Slugs were collected by community members.

Based on previous occurrences and the criteria identified in Table 4, the magnitude and severity to the Aleutians East Borough Planning Area from invasive species are considered **Limited**.

#### 3.2.7.5 Impact

In a broad sense, invasive species introduction can affect the Aleutians East Borough Planning Area by altering the habitat composition, outcompeting native species for food and territory, impacting existing predator/prey relationships, or otherwise disrupting natural habitat functions (ADFG 2026). Over time, these impacts can contribute to the overall loss of biological diversity and potential negative economic/socioeconomic impacts in the Aleutians East Borough Planning Area.

**Invasive Terrestrial Plants:**

While most non-native plant populations in the Aleutians East Borough Planning Area are small and restricted to human disturbed areas, a number of plant species with a high invasiveness ranking can threaten intact biological communities (ACCS 2008). Invasive plants like Orange Hawkweed and Canada Thistle by displacing native vegetation and reduces habitat quality for native plants in the Aleutians East Borough Planning Area.

**Invasive Terrestrial Animals:**

The invasive Norway Rat is known to have many impacts to the local ecosystem where they are introduced. In Akutan, which is the Aleutians East Borough Planning Area's only community with rat populations, the recorded impacts are mainly to the local environment. Invasive rats have the potential to devastate native seabird populations, which can eventually restructure the entire ecosystem of the Aleutians East Borough Planning Area.

**Invasive Aquatic Animals:**

Invasive aquatic species like the European Green Crab can cause extensive damage to commercial and subsistence fisheries in the Aleutians East Borough Planning Area (ADFG 2026). These crabs outcompete the native Dungeness crabs for food and habitat, which can result in detrimental changes in ecosystem dynamics. While annual detection surveys are conducted annually, there have been no reports of the European Green Crab occurring in the Aleutians East Borough Planning Area.

**European Black Slugs:**

Little is known about the impact the European Black Slug has on the natural environment, mainly due to the fact that the majority of sightings of slugs are located near disturbed or heavily populated areas. Primary recorded impacts in Alaska related to invasive slugs are primarily damages to vegetation in local gardens.

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | The primary impact of invasive species on the land surrounding the Aleutians East Borough Planning Area have been localized non-native plant, slugs, and rat infestations, which can outcompete native plants and wildlife. |
| Infrastructure | There is limited evidence that invasive species have directly impacted infrastructure in the Aleutians East Borough Planning Area. |

| Description of Previous/Potential Impacts | |
|---|---|
| People | While invasive species can affect resources that people depend on, the Aleutians East Borough Planning Area has no history of invasive species directly affecting the residents of the community. |
| Utilities | There have been no documented cases of invasive species causing utility disruptions in the Aleutians East Borough Planning Area. |
| Transportation | Transportation is identified as a major pathway for invasive species to spread throughout the Aleutians East Borough Planning Area. Due to the nature of invasive species in the community, there is little evidence to show that these species cause direct damage to transportation infrastructure in the Aleutians East Borough Planning Area. |
| Economy | There have been no reports of an invasive species infestation resulting in significant economic impacts in the Aleutians East Borough Planning Area. |
| Subsistence Resources | Invasive species pose a potential threat to subsistence resources in the Aleutians East Borough Planning Area. Species like the European Black Slug are known to feed on plants and berries, a key aspect to subsistence culture for the region.<br>Local and Tribal observations also identify invasive species as a community concern beyond documented ecological impacts. |

#### 3.2.7.6 Probability of Future Events

Based on previous occurrences, and the criteria identified in Table 5, it is **Likely** that the Aleutians East Borough Planning Area will experience an invasive species event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### 3.2.7.7 Future Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is possible future climate conditions will influence the nature of invasive species. Warmer temperatures and longer growing seasons may allow some invasive species to become established in areas where they don't historically occur. |
| Location | It is likely future climate conditions will influence the location of invasive species in the Aleutians East Borough Planning Area. Changes in temperature and precipitation patterns may allow invasive species to expand into new terrestrial and marine areas of the Aleutians East Borough Planning Area. |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of invasive species in the Aleutians East Borough Planning Area. Future changes may create favorable conditions for certain invasive species, allowing populations to spread at a rapid rate. |
| Impact | It is likely future climate conditions will influence the impacts of invasive species in the Aleutians East Borough Planning Area. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of invasive species in the Aleutians East Borough Planning Area. As environmental conditions change, areas that were previously unsuitable for certain invasive species may become more favorable for establishment and spread, which increases the probability of future events in the Aleutians East Borough Planning Area. |

| Description of Future Conditions | |
|---|---|
| Population Patterns | It is possible future climate conditions will influence population patterns in the Aleutians East Borough Planning Area. Changes in the distribution and abundance of invasive species may alter the availability of food and habitat relied upon by wildlife and residents of the Aleutians East Borough Planning Area. |
| Land Use Development | It is unlikely future climate conditions will influence future land use development in the Aleutians East Borough Planning Area. |
| Subsistence Resources | It is likely future climate conditions will influence subsistence resources in the Aleutians East Borough Planning Area. Changes in ocean conditions, weather patterns, and species distribution may affect the availability and accessibility of important subsistence resources. The introduction or expansion of invasive species could further impact native species that support subsistence activities in the Aleutians East Borough Planning Area. |

## 3.2.8 Sediment Deterioration and Land Destabilization

### 3.2.8.1 Nature

Land destabilization is defined as wearing away of the ground surface as a result of the movement of wind, water, or ice. Land destabilization is a gradual process, but it can occur rapidly as the result of storms with significant precipitation, floods, permafrost degradation, or other events. Land destabilization may cause the destruction of property, development, and infrastructure, but is rarely linked to direct human death or injury. Sediment deterioration refers to the progressive decline in the physical or biological quality of sediment caused by natural processes, such as coastal flooding and storm surges.

Land destabilization poses a threat to communities where disappearing land threatens infrastructure and development. The Aleutians East Borough Planning Area is primarily threatened by coastal shoreline destabilization, and to a more localized extent, riverine land destabilization.

**Coastal Land Destabilization**

Coastal land destabilization is described as the wearing or washing away of coastal lands. Coastal land destabilization is measured as the rate of change in the position or horizontal displacement of a shoreline over time. Bluff recession is the most visible aspect of coastal land destabilization because of the dramatic change it causes to the landscape. As a result, this aspect of coastal land destabilization usually receives the most attention from the community.

Coastal land destabilization can occur from rapid, short-term, daily, seasonal, or annual natural events such as wind, waves, storm surge, coastal storms, and/or flooding. The most intense land destabilization often occurs during storms, particularly because the highest energy waves are generated under storm conditions.

Coastal land destabilization may also be attributed to multi-year impacts and long-term climatic change. These impacts may include sea-level rise, subsidence, lack of sediment supply, or long-term human factors such as the construction of shore protection structures and dams.

Shore protection measures such as seawalls and jetties may reduce destabilization locally but can alter sediment transport and increase destabilization elsewhere along the shoreline.

Damage from coastal land destabilization is typically a gradual event. However, significant storm events can cause the ground beneath infrastructure and homes to weaken. In extreme but not unheard-of cases, homes built near the coast have fallen into the sea due to eroded cliffs.

**Riverine Land Destabilization**

Riverine land destabilization is like coastal land destabilization but occurs on a riverbed or riverbank rather than the coast. Riverine land destabilization is a natural process in almost any river but can be intensified by natural and human influence. The variables that influence the stability (or erodibility) of stream banks in riverine land destabilization include:

- Critical height of the slope
- Inclination of the slope
- Cohesive strength of the soil in the slope
- Distance of the structure in question from the shoulder of the stream bank
- Degree of stabilization of the surface of the slope
- Level and variation of groundwater within the slope
- Level and variation in level of water on the toe of the slope
- Tractive shear stress of the soil
- Frequency of rise and fall of the surface of the stream

While there are riverine systems throughout the Aleutians East Borough Planning Area, most infrastructure development is along the coastal shoreline, which makes coastal land destabilization a greater concern for the Aleutians East Borough Planning Area.

#### 3.2.8.2 Location

Land destabilization can occur throughout the entire Planning Area, with each community facing varying degrees of impact. Since every established community in the Aleutians East Borough Planning Area is classified as a coastal community, they are all susceptible to shoreline destabilization. Land destabilization threats to the Aleutians East Borough Planning Area are primarily associated with coastal processes and localized riverine activity. Coastal land destabilization is driven by storm surges, high winds, and severe storms that contribute to destabilization along the Aleutians East Borough Planning Area's extensive coastline.

***All communities within the Aleutians East Borough (besides Cold Bay) are concerned about sediment deterioration and land destabilization/shoreline loss.***

While the extent of land destabilization in the Aleutians East Borough Planning Area varies by location, many communities in the Aleutians East Borough Planning Area contain critical marine infrastructure that may be increasingly vulnerable to future destabilization.

#### 3.2.8.3 History

The Aleutians East Borough Planning Area has had a history of land destabilization across all communities, with coastal destabilization occurring more extensively than riverine bank destabilization. Historically

**Coastal Destabilization**:

The history of coastal land destabilization in the Aleutians East Borough Planning Area varies by community due to the localized nature of storms in the region. See specific jurisdiction annexes for a detailed overview of the history of land destabilization for each jurisdiction. Historically, the Aleutians East Borough Planning Area has not had any widespread destabilization events that have impacted all communities simultaneously. Instead, destabilization has occurred as localized events associated with specific storm systems and seasonal weather patterns. Below is a brief description of the historical timeline of coastal land destabilization in the Aleutians East Borough Planning Area:

In the early 2000s, seasonal destabilization from storms were reported in communities such as King Cove, False Pass, and Nelson Lagoon, while Sand Point reported relatively few problems related to land destabilization (USACE 2007). Currently, most communities in the Aleutians East Borough Planning Area experience minimal localized destabilization to their coastlines, while communities situated on a narrow exposed spit, like Nelson Lagoon currently experience advancing destabilization conditions on both sides of the community (UAF 2021).

**Riverine Destabilization**:

Historical accounts of riverine destabilization in the Aleutians East Borough Planning Area is highly limited, with the majority of documented reports occurring near Nelson Lagoon. While official data is limited, the USACE reported that the Sapsuk River, an important source for subsistence resources, have experienced historical destabilization.

#### 3.2.8.4 Extent (Magnitude and Severity)

Land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of land destabilization vary throughout select communities. In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (Denali Commission 2019). To identify risk, communities are grouped into three categories, groups 1-3, with group 1 (red) most at-risk, group 2 (yellow) at moderate risk, and group 3 (green) at lower risk. The communities of Sand Point, King Cove, and Akutan were categorized in erosion group 3, False Pass was categorized in erosion group 2, and Nelson Lagoon was categorized in erosion group 1 (Denali Commission 2019).

Nelson Lagoon is identified as the community in the Aleutians East Borough Planning Area experiencing the most significant land destabilization. According to the most recent USACE study, the Nelson Lagoon shore experiences an average loss of 1-2 ft per year (USACE 2007). According to the Native Village of

Nelson Lagoon Planning Team, over 5000 feet of water line has been washed out from coastal sediment deterioration and land destabilization resulting from sea level rise and storm surges.

Based on previous occurrences and the criteria identified in Table 4, the magnitude and severity to the Aleutians East Borough Planning Area from a land destabilization event are considered **Limited**, with injuries and/or illnesses that do not result in permanent disability; complete shutdown of critical facilities for more than one week; and more than 10% of critical facilities being severely damaged. See the land destabilization magnitude and severity classification for each jurisdiction in it's respective jurisdictional annex.

#### 3.2.8.5 Impact

Impacts from land destabilization can range in severity and include loss of land and potentially any infrastructure built on the land. Other impacts include damage to public utilities (fuel headers and electric and water/wastewater utilities), loss of the Native aquatic habitats, high sediment loads reducing water quality, and economic impacts associated with the costs of trying to mitigate the impacts from land destabilization.

Local and Tribal observations indicate that the impacts of sediment deterioration and land destabilization can extend beyond developed property and infrastructure to include traditional access routes, subsistence and gathering areas, cultural resources, and places with continuing cultural importance.

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding the Aleutians East Borough Planning Area has been damages to shoreline and beaches, particularly along areas exposed to waves and storms.<br>Wave action, storm surges, high tides, and high winds drive sediment deterioration and land destabilization in the Aleutians East Borough Planning Area, particularly during storm events. |
| Infrastructure | Sediment deterioration and land destabilization impacts in the Aleutians East Borough Planning Area have been documented throughout the region. Continued sediment deterioration and land destabilization could threaten additional community infrastructure and increase mitigation costs. |
| People | While sediment deterioration and land destabilization can affect residents of the Aleutians East Borough Planning Area by threatening homes and community access, direct impacts to people in the region resulting from sediment deterioration and land destabilization have been limited. |
| Utilities | Beyond the washed-out water line in Nelson Lagoon, limited impacts to utilities within the Aleutians East Borough Planning Area have been documented as a result of sediment deterioration and land destabilization events. |
| Transportation | The primary transportation related impacts from a sediment deterioration and land destabilization event in the Aleutians East Borough Planning Area are damage to roads, boardwalks, and other transportation infrastructure. There have been no reports of sediment deterioration and land destabilization resulting in substantial disruptions to transportation in the Aleutians East Borough Planning Area. |
| Economy | Land destabilization due to coastal flooding can threaten communities and transportation infrastructure within the Aleutians East Borough Planning Area. Many of the communities, particularly Nelson Lagoon have airports that are in close proximity to the coast, which increase the possibility of destabilization resulting in transportation related impacts (AFN 2018).<br>There are also a substantial number of roads in the Aleutians East Borough Planning Area that can experience long term land destabilization related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or |

| | Description of Previous/Potential Impacts |
|---|---|
| | mitigation activities. Roadways leading to the airport could be destabilized during floods, heavy rain, or landslides which would cut off access to the airport, even if the airport remains unimpacted. |
| Subsistence Resources | Land destabilization in the Aleutians East Borough Planning Area can also contribute to substantial cultural impacts. While these impacts are historically localized, a Planning Area-wide storm can contribute to sediment deterioration throughout each community. Sediment deterioration and land destabilization can affect subsistence resources and traditional-use areas by altering shorelines, beaches, waterways, gathering areas, and other environmental resources. Loss of land may also damage or restrict access to fish camps, harvesting areas, traditional routes, and other places important to continued subsistence and cultural practices. |

#### 3.2.8.6 Probability of Future Events

All of the Aleutians East Borough Planning Area's communities with the exception of Sand Point were developed on low-lying lands adjacent to coastal beaches. This geography influences the likelihood of continued land destabilization in the Aleutians East Borough Planning Area.

Future climate conditions, such as more frequent and intense storm events can increase land destabilization and result in greater amounts of sediment loss. There has not been a Borough-wide land destabilization assessment in the Aleutians East Borough Planning Area, with most past destabilization studies focusing on specific communities, such as Nelson Lagoon.

Based on the physical characteristics of the Aleutians East Borough Planning Area and the criteria identified in Table 5, it is **Highly Likely** that the Aleutians East Borough Planning Area will experience a sediment deterioration and land destabilization event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### 3.2.8.7 Future Conditions

| | Description of Future Conditions |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of land destabilization. |
| Location | It is possible future climate conditions will influence the location of land destabilization in the Aleutians East Borough Planning Area. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal land destabilization in the Aleutians East Borough Planning Area (AK DGGS 2026). |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of land destabilization in the Aleutians East Borough Planning Area. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of land destabilization events in the Aleutians East Borough Planning Area. Projected increases in precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |

| Description of Future Conditions | |
|---|---|
| Probability of Future Events | It is likely future climate conditions will influence the probability of land destabilization in the Aleutians East Borough Planning Area. Although the probability for land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |
| Population Patterns | It is possible future climate conditions will influence population patterns in the Aleutians East Borough Planning Area. Continuation or increased frequency of land destabilization could cause residents to move out of hazard areas or relocate out of the Aleutians East Borough Planning Area entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in the Aleutians East Borough Planning Area. Due to an increase in precipitation events, the likelihood of land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in the Aleutians East Borough Planning Area. Due to an increase in precipitation events, the likelihood of land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

## 3.2.9 Severe Weather

### 3.2.9.1 Nature

Severe weather is any dangerous meteorological development that has the power to cause damage or disruption, including the loss of human life.

The entire Planning Area (all jurisdictions) experiences periodic severe weather events such as dense fog, drought, extreme cold, heavy rain, heavy snow, and high winds.

| Severe Weather Event | Nature of the Event |
|---|---|
| Dense Fog | Fog usually forms under clearing skies after several days of rain. An inversion (stable atmosphere) forms in the valleys and channels that can last for several days. This inversion shelters the fog from mixing out from winds. The fog will last until the inversion mixes out due to winds picking up from a weather front moving into the area.<br>Dense fog is defined as fog reducing visibilities to ¼ mile or less for an hour or longer. |
| Drought | Summer dry periods can reduce water availability and increase potential wildfire risk. There is no dry season in the Aleutians East Borough, with precipitation occurring all months of year. However, abnormally dry conditions have and do occur, especially in the summer months. |
| Extreme Cold | Extreme cold is generally defined as a prolonged period of excessively cold weather. Extreme cold conditions are often, but not always, part of winter storms.<br>In Alaska, extreme cold usually involves temperatures between -20 to -50°F or more. |
| Heavy Rain | Heavy rain occurs when the precipitation rate is above 0.30 inches per hour. |
| Heavy Snow | Heavy snow generally means snowfall accumulating to four inches or more in depth in 12 hours or less and six inches or more in depth in 24 hours or less.<br>A winter storm is a combination of heavy snow, blowing snow, and/or dangerous wind chills. A winter storm can be life-threatening.<br>Drifting snow is the uneven distribution of snowfall and snow depth caused by strong surface winds. Drifting snow may occur during or after a snowfall. |
| High Winds | Strong winds pose a moderate threat to a community when they reach sustained speeds of 26 to 39 mph, or frequent wind gusts of 35 to 57 mph. High winds pose a high threat to a community when they reach sustained speeds of 40 to 57 mph. High winds pose an extreme threat to a community when they reach sustained speeds greater than 58 mph, or frequent wind gusts greater than 58 mph.<br>While Alaska does not experience hurricanes, it experiences hurricane-force winds, defined as 74 miles per hour and greater by the National Weather Service. The Aleutian Islands experience frequent high wind events. |

Severe weather in the Aleutians East Borough Planning Area is primarily driven by interactions of the Aleutian Low-pressure system, which is a region of generally low pressure where sub-polar cyclones reach their maximum intensity. The Aleutian Low shifts position and sits further south during the winter, where it is largest and most intense. In the summer, the Aleutian Low is located farther north and decreases in size and intensity. The Aleutian Low area is the stormiest area in the north Pacific Ocean, sending storms eastward along the Aleutian chain with westerly winds. These storms are strongest in the winter. See Figure 19 in Section 3.2.5 for a visual of the Aleutian Low.

### 3.2.9.2 Location

The entire Planning Area (all jurisdictions) experiences periodic severe weather events.

### 3.2.9.3 History

Severe weather events occur annually in the Aleutians East Borough Planning Area.

Table 15 lists severe weather events that have occurred in the Aleutians East Borough between 1996 and March 2026. High wind events are the most frequent severe weather event impacting the Aleutians East Borough Planning Area.

**Table 15- Historical Severe Weather Events in the AEB Planning Area (1996 - March 2026)**

| Date | Event Type | Event Description |
|---|---|---|
| 1996-05-24 | High Wind | Wind gusts reached at least 45 mph at Akutan. |
| 1996-10-28 | High Wind | Akutan reported gusts in excess of 65 mph and 53 mph at Cold Bay. |
| 1996-10-31 | High Wind | Wind gusts reached 54 mph at Cold Bay and close to 85 mph at Akutan. |
| 1996-09-25 | High Wind | Wind gusts reached 45 mph at the Cold Bay Airport and 60 mph in Akutan. |
| 1996-09-11 | High Wind | Wind gusts of 43 mph from the north were recorded at the Akutan school<br>Wind gusts reached 45 mph at Cold Bay |
| 1996-09-12 | High Wind | Strong wind gusts of 70 mph were reported at the Akutan school. |
| 1997-11-04 | High Wind | Wind gusts of 70 to 90 mph were reported at the Akutan school. |
| 1998-04-09 | High Wind | Prefrontal winds reached 75 mph at Cold Bay. |
| 2006-02-13 | High Wind | Reports received from the vessel Stimson in Akutan were of wind peaking at 123 KTS that resulted in the vessel "tipping over" in the harbor. |
| 2015-11-11 | High Wind | Damage at Akutan reported by local emergency manager: Construction materials at a new fourplex blown away. Very strong winds still occurring. |
| 2017-11-23 | High Wind | Akutan AWOS measured 76 knot winds at 2:35 a.m. |
| 2020-02-08 | High Wind | Akutan Airport had a peak gust to 84 mph during this time. |
| 2024-01-06 | High Wind | Akutan measured a gust of 89 knots (102 mph). Winds then decreased through the evening hours. Additionally, the storm caused some damage, with a boat flooding due to the weight of the rain and snow and a breakwater which had been damaged previously receiving additional damage. |
| 2024-09-17 | High Wind | A marine exchange observation (site AKXA2 in Akutan) reported a gust to 82 mph at about 2 PM AKST, then later reported a gust to 93 mph about an hour later shortly before 3 pm AKST. The legitimacy of the higher end gust, however, was not able to be verified by any other sources nearby. |
| 2024-10-04 | High Wind | Wind gusts of 65 knots (75 mph) or greater were observed in Akutan and at other stations around Unalaska. |
| 2024-10-10 | High Wind | Numerous other mesonet sites recorded gusts between 75 and 95 mph across the eastern Aleutians, including in Nikolski and Akutan at varying times between approximately 9 AM AKST 10/11 to 5 AM AKST 10/12. |
| 2025-01-22 | High Wind | A C-MAN Station in Akutan reported a wind gust of 82 mph at 4:42 PM AKST on January 22nd. Winds were gusting to over 70 mph for two hours before this peak wind gust was reported and continued to gust to over 70 mph until 6:00 PM AKST the same day. |

| Date | Event Type | Event Description |
|---|---|---|
| 2025-01-23 | High Wind | The False Pass ASOS station (PAKF) reported wind gusts over 60 mph from 11:40 AM AKST to 7:30 PM AKST on January 23rd. Gusts peaked at 75 mph at 2:55 PM and 2:56 PM AKST. Wind gusts reached 60 mph in Cold Bay and 67 mph in Akutan the same day. |
| 2025-04-03 | Winter Storm | In Akutan, visibility below half a mile was shown by a webcam in the evening hours of April 3rd. A TV meteorologist from KTUU relayed that a source in Akutan reported 8 to 10 inches of snow accumulation in the town with 2 to 4 ft snow berms on April 4th. Winds gusted to 60 mph. |
| 2025-04-15 | Winter Storm | In Akutan, a news reporter relayed that 10 to 15 inches of snow fell in the settlement with winds gusting to 60 to 80 mph. Snow berms/drifts were built up to 4 feet. |
| 2026-01-04 | High Wind | The Eastern Aleutians including Unalaska and Akutan saw winds gusting over 80 mph from January 4 to January 5. A marine observation site in Akutan (NDBCAKXA2) had a peak wind gust of 107 mph at 2:12 PM AKST January 5. The site also reported more gusts over 100 mph around the same time. |

Source: NOAA NCEI 2026b - Storm Events Database

Aleutian Pribilof Islands Association reported that during Typhoon's Merbok and Halong that winds of up to 100 mph were reported in the area.

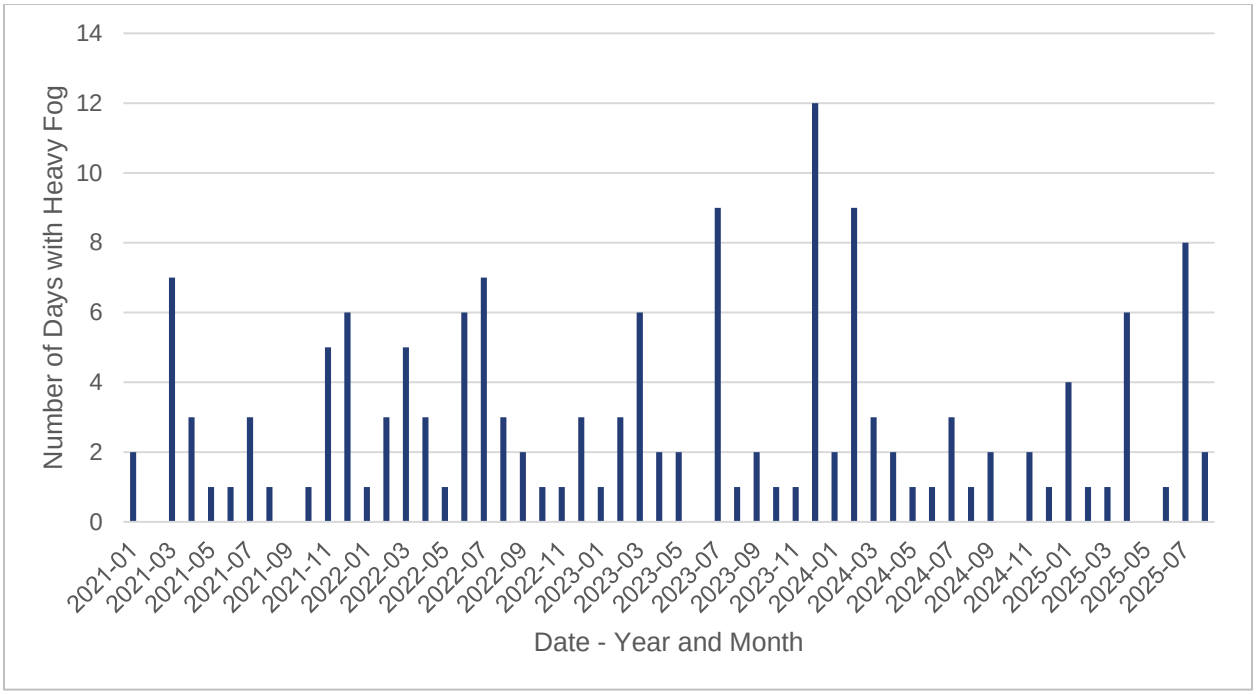
#### 3.2.9.4 Extent (Magnitude and Severity)

***Extent - Dense Fog***

Dense fog forms usually forms when moist air moves over cold surfaces. It can drop visibility to a quarter-mile or less, making navigation and transit difficult. Dense fog forms when winds are calm, which prevents air that is saturated with moisture from mixing with drier air above. Instead, that moist air pools at the surface.

NOAA's National Centers for Environmental Information (NCEI) records climatological conditions from airport weather stations. Figure 32 compiles the number of days with heavy fog per month from January 2021 to August 2025 at the Cold Bay Airport. This information was not available for all jurisdictions (just Cold Bay and Sand Point). While not necessarily representative of each jurisdiction in the Aleutians East Borough Planning Area, this information provides an example of extent that may be observed across the remaining jurisdictions.

The NCEI defines heavy fog as any calendar day that includes at least one official weather observation reporting horizontal surface visibility of 0.25 miles or less. In this time-period, the month with the highest number of heavy fog days occurred in December 2023, with 12 days of heavy fog.




Source: NOAA NCEI 2026

**Figure 32- Number of Days with Heavy Fog at Cold Bay Airport, January 2021-August 2025**

### *Extent - Drought*

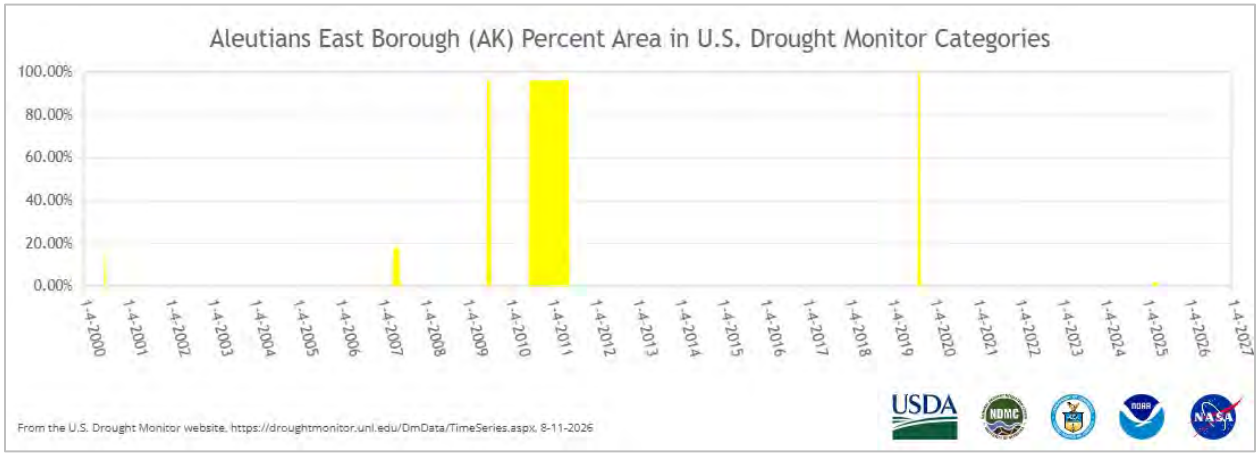
The U.S. Drought Monitor (USDM) uses the following scale to report the location and intensity of drought across the country. The scale uses four categories of drought, from the least intense, D0, to the most intense, D4 (U.S. Drought Monitor 2026).




Source: U.S. Drought Monitor 2026

**Figure 33- Drought Classification**

Figure 34 shows drought history for the Aleutians East Borough from January 2000 – July 2026. It shows that D0: Abnormally Dry drought conditions occurred in 2000, 2007, 2009, 2010/2011, 2019, and 2025.

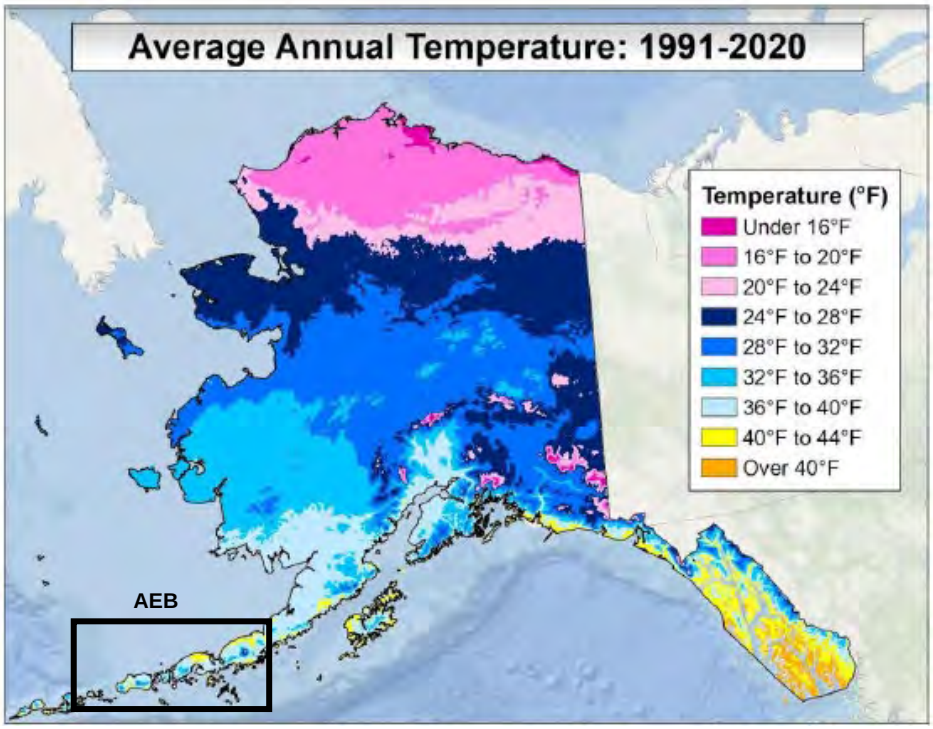



Source: U.S. Drought Monitor 2026

**Figure 34- Aleutians East Borough Drought History, 2000 – July 2026**

### *Extent – Extreme Cold*

Figure 35 shows Alaska's average annual temperature from 1991-2020. The Aleutians East Borough Planning Area experienced average temperatures in the 32 to 44 °F range during this time. This dataset is updated every 10 years and was most recently updated in 2021.




Source: NOAA NCEI Gridded Normals

**Figure 35- Alaska Average Annual Temperature 1991-2020**

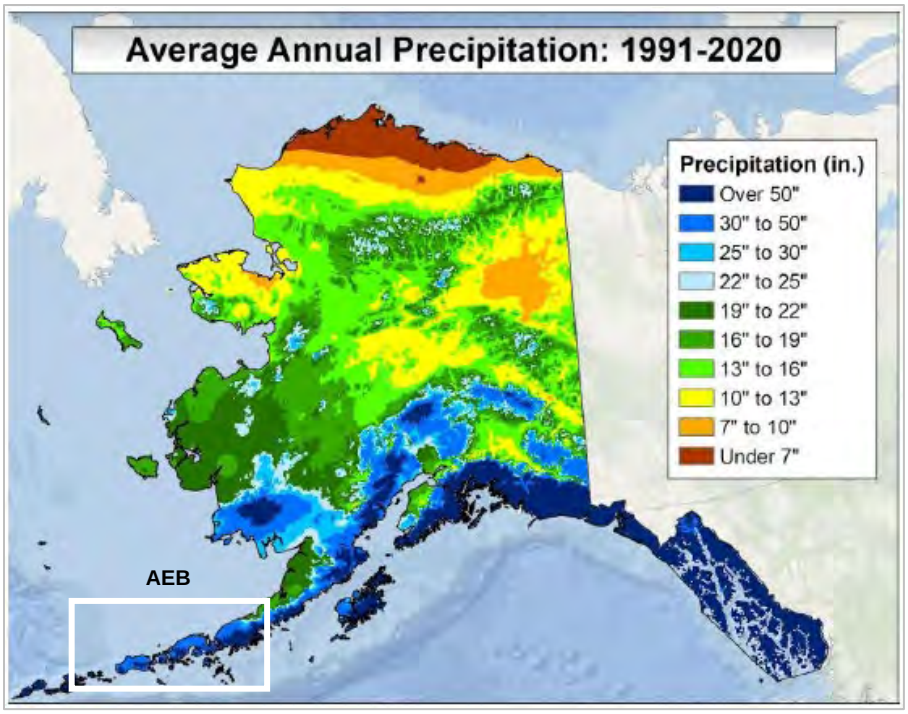
The marine environment has a moderating influence on temperatures in the region. While extreme cold air can and occasionally does enter this region, the air is generally moist and warm, having been swept in off extensive ocean areas.

Temperatures in the Aleutians East Borough range from -9° in the winter to 76°F in summer months.

The National Weather Service records monthly climate normals from 1991 to 2020 at the Cold Bay Airport. While not necessarily representative of average temperatures throughout the Aleutians East Borough Planning Area, this information is relevant regionally given Cold Bay's location within the Aleutians East Borough Planning Area. The average temperature during this timeframe in January was 28.4 °F, while the average August temperature was 52.6 °F (NWS NOWData 2026).

### *Extent – Heavy Rain*

Figure 36 shows Alaska's average annual precipitation from 1991-2020. This figure shows that annual average annual precipitation ranges from 30 inches to over 50 inches. This dataset is updated every 10 years and was most recently updated in 2021.




Source: NOAA NCEI Gridded Normals

**Figure 36- Alaska Average Annual Precipitation 1991-2020**

There is no dry season in the Aleutians East Borough. Precipitation occurs all months of year, with the wettest time between August and January. Storms can bring heavy rainfall at any time of year. Annual precipitation in the Borough is 30-50 inches.

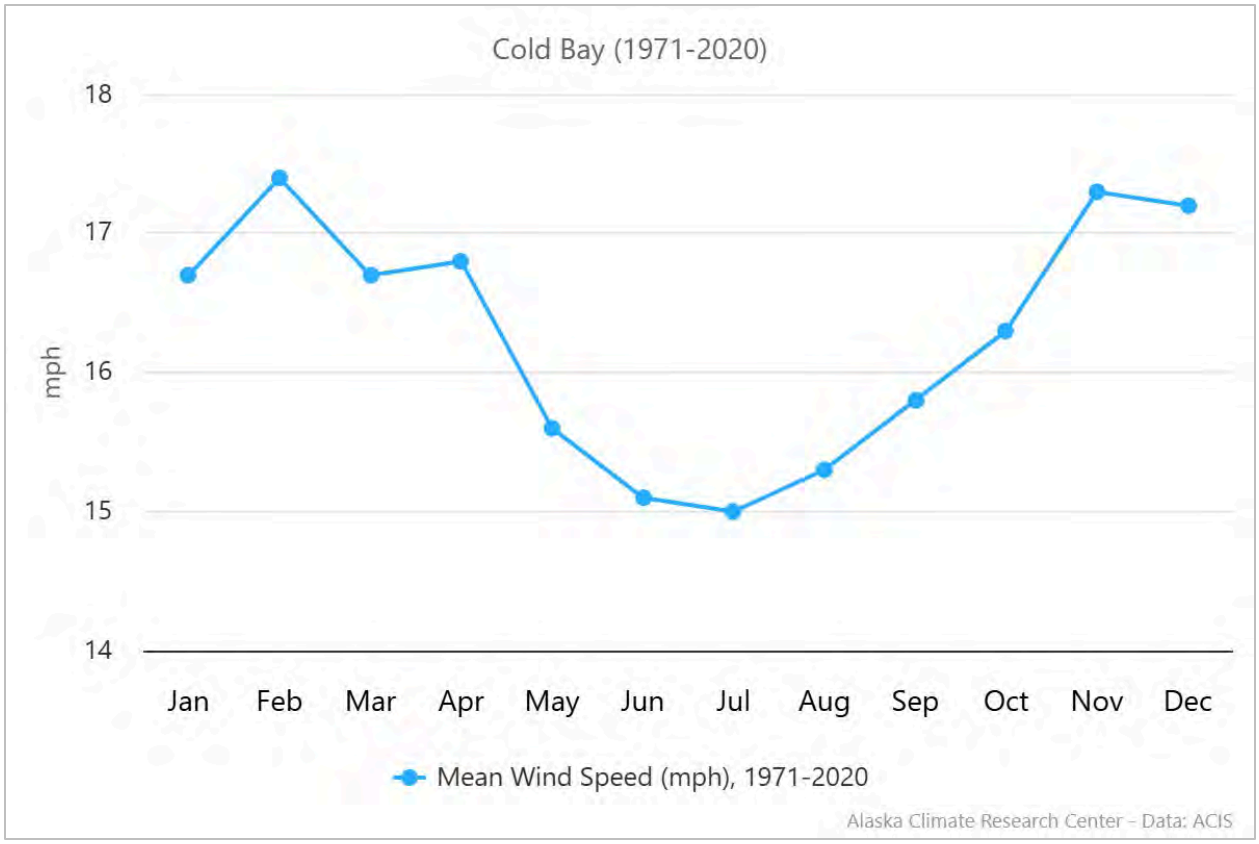
### *Extent – Heavy Snow*

Annual snowfall in the Aleutians East Borough is 52 inches.

### *Extent – High Wind*

The Aleutian Islands have the highest average wind speed of any region in the United States. Wind gusts of 70+ mph are common in the Aleutians East Borough, particularly during fall storms.

There is a First Order Automated Surface Observing System (ASOS) at the Cold Bay airport (ID USW00025624). This data is not available for all jurisdictions. This station has been collecting data since 1971 and shows the highest monthly average wind speeds during the winter months, per Figure 37. Between 1971 and 2020, the highest mean wind speeds were recorded in the winter months.




Source: UAF ACRC

**Figure 37- Cold Bay Mean Wind Speeds, 1971-2020**

NOAA's National Centers for Environmental Information (NCEI) reports monthly peak wind speeds and maximum sustained wind speeds at the Cold Bay Airport. This data is currently available through August 2025 (NOAA NCEI 2026). While wind speeds vary across the region, this data is relevant regionally due to Cold Bay's location within the Aleutians East Borough Planning Area.

During this time, the maximum peak wind speed recorded was 88 mph in December 2022 and January 2024. The maximum sustained wind speed recorded was 67 mph in December 2022 (NOAA NCEI 2026). NCEI defines maximum sustained wind as the fastest reported wind speed for the day that is sustained for at least 2 minutes. For comparison, a Category 1 hurricane has sustained wind speeds of 74 to 95 mph.

Based on past severe weather events and the criteria identified in Table 4, the extent (magnitude and severity) of severe weather in the Aleutians East Borough Planning Area is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### 3.2.9.5 Impact

The Aleutians East Borough Planning Area is a remote region accessible only by air and water. Some of severe weather's most dire impacts relate to delays and disruptions in transportation.

The Bureau of Transportation Statistics tracks weather's share of delayed flights at major airports across the United States, but this data is not available for airports in the Aleutians East Borough Planning Area.

***Information on impacts to individual jurisdictions can be found in Volume 2. Jurisdictional Annexes.***

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | Dense Fog: Persistent marine fog can contribute to slick conditions on coastal trails and roads.<br>Drought: Drought conditions can impact subsistence resources, ecosystem functions, and increase wildfire risk. Drought can dry out tundra and reduce lake levels.<br>Extreme Cold: Extended cold spells can cause ice buildup on coasts and tundra and potentially increase freeze-thaw damage.<br>Heavy Rain: Heavy rain can cause land destabilization, sediment transport, and flooding. Heavy rain also increases landslide and debris-flow potential in steep terrain. Saturated soils can destabilize slopes.<br>Heavy Snow: Heavy snow can alter flooding and melt patterns, impacting trail access and distribution of flora and fauna.<br>High Winds: High winds drive wave runup, worsening storm impacts such as land destabilization. |
| Infrastructure | Dense Fog: Dense fog can indirectly impact physical infrastructure by causing delays in repairs and reducing safe operation of equipment and infrastructure such as small harbors.<br>Drought: Drought can impact water system intakes and increase wear on community water infrastructure<br>Extreme Cold: Extreme cold can cause infrastructure and home damage when pipes freeze or extreme cold impacts mechanical systems. In extreme cold conditions, frozen pipes, equipment failures, and structural strain can occur more frequently.<br>Heavy Rain: Heavy rain can overwhelm drainage and flood protection systems, causing localized flooding. It can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, bulk fuel storage, docks, landfills, cemeteries, and homes. Freezing rain can cause damage to infrastructure (tree limbs with freezing rain can damage power lines, ice buildup can damage water conveyance systems).<br>Heavy Snow: Heavy snow can load roofs and structures, increasing the risk of damage or collapse.<br>High Winds: High wind can cause infrastructure and home damage, such as damage to roofing, utility lines, docks, and fuel storage. |
| People | Dense Fog: Dense fog can interrupt travel and affect access to critical medical care. Reducing visibility, dense fog can increase the risk of injury, especially in settings such as boat harbors and fishery facilities where operational hazards are already present.<br>Drought: Water shortages can impact drinking water security and increase wildfire risk, presenting risks to human health and safety.<br>Extreme Cold: Extreme cold events pose dangers to human health, including frostbite and hypothermia. Extreme cold can also lead to heating emergencies for residents, such as being without heat for extended periods of time.<br>Heavy Rain: Heavy rain can flood homes, increase the risk of mold, other health risks, and displacement.<br>Heavy Snow: Heavy snow can make mobility difficult for people, especially those with mobility impairments. Heavy snow can also increase the risk of injury and social isolation, especially for elders.<br>High Winds: High winds can occur any time of year. In the winter, high winds associated with winter storms can lead to dangerous wind. High winds can lead to dangerous driving, boating, and general transportation conditions for people, leading |

| | Description of Previous/Potential Impacts |
|---|---|
| | to isolation and reduced access to community and healthcare services. Flying debris increases injury risk. Home damage from high winds impact housing security. |
| Utilities | Dense Fog: Dense fog can slow maintenance work and complicate utility inspections.<br>Drought: Drought can strain community water systems and reduce availability of drinking water from lakes, streams, or reservoirs. It can also drive up the cost of water treatment.<br>Extreme Cold: These events, especially when prolonged, can increase energy demand. Extreme cold can freeze lines and increase the need for utility repairs.<br>Heavy Rain: Heavy rain can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, bulk fuel storage, docks, landfills, cemeteries, and homes. Freezing rain can cause damage to powerlines and pipelines. Heavy rain can increase contamination risk if and when floodwaters breach utility infrastructure such as sewage lagoons.<br>Heavy Snow: Heavy snow can cause power disruptions and delay deliveries of utility-related materials such as fuel.<br>High Winds: High winds can knock down trees and powerlines, directly or indirectly damaging utility infrastructure and potentially causing prolonged power outages. |
| Transportation | Dense Fog: Dense fog reduces aviation and marine visibility, causing delays and cancellations. Fog can also impact emergency response and medevac operations.<br>Drought: Extreme drought can contribute to low water levels in rivers and bays, potentially limiting navigability. Dust can lead to road degradation.<br>Extreme Cold: Extreme cold can disrupt transportation and complicate emergency response. Specifically, extreme cold can reduce vehicle reliability and lead to aircraft delays.<br>Heavy Rain: Heavy rain can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, and docks. Roads and runways can wash out or otherwise become impassible, limiting travel in and out of villages.<br>Heavy Snow: Heavy snow can block roads and runways, impede emergency response and delay freight and transportation. When combined with high wind conditions, blinding blizzards that impede transportation may occur.<br>High Winds: High winds can create dangerous marine conditions, disrupting freight and travel. Airplanes and medevac flights will not fly above certain wind speed thresholds. High winds increase turbulence hazards. |
| Economy | Dense Fog: Dense fog can disrupt fishing and transport-dependent economic activities.<br>Drought: Low water availability can stress fisheries and increase costs related to water utilities and wildfires.<br>Extreme Cold: Extreme cold can increase heating costs, burdening households and businesses. Other economic activities such as marine activity may decline in periods of extreme cold.<br>Heavy Rain: Heavy rain related damages raise repair costs for homeowners, local governments, and local businesses.<br>Heavy Snow: Heavy snow events increase costs related to snow removal. Heavy snow events can delay freight and transportation.<br>High Winds: High wind events can interrupt fishing and shipping activities. Wind-related damage can be expensive to repair. |

| | Description of Previous/Potential Impacts |
|---|---|
| Subsistence Resources | Local and Tribal observations indicate that severe weather can affect subsistence systems not only by influencing the availability of resources, but also by limiting safe access and shortening opportunities for harvesting and other traditional activities.<br>Dense Fog: Fog can reduce visibility during subsistence activities, such as marine or travel to subsistence sites.<br>Drought: Drought conditions can impact subsistence resources, ecosystem functions, and increase wildfire risk.<br>Extreme Cold: Extreme cold can impact winter hunting and subsistence activities. It can change the timing of subsistence harvest activities.<br>Heavy Rain: Heavy rains can impact the availability and timing of subsistence species. Flooding can impede access to subsistence areas.<br>Heavy Snow: Heavy snow can impact wildlife movement, slow human travel, and impact subsistence species such as berries.<br>High Winds: High winds can impact transportation associated with subsistence activities. High winds and other severe weather events can damage subsistence equipment, such as boats and drying racks. |

#### 3.2.9.6 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 5, it is **Highly Likely** that the Aleutians East Borough Planning Area will experience a severe weather event (dense fog, extreme cold, heavy rain, heavy snow, or high winds), within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

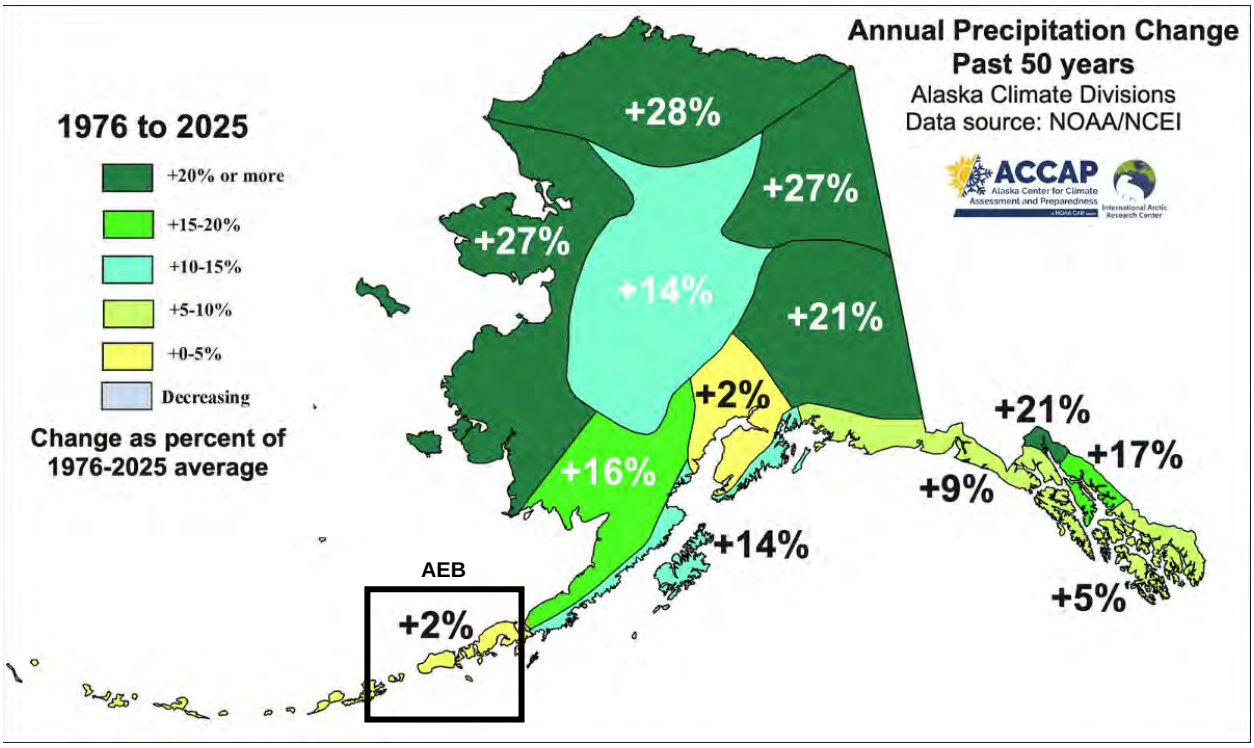
### 3.2.9.7 Future Conditions

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in the Aleutians East Borough Planning Area. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in the Aleutians East Borough Planning Area. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in the Aleutians East Borough Planning Area. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in the Aleutians East Borough Planning Area. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in the Aleutians East Borough Planning Area. | It is unlikely that future climate conditions will influence the nature of future high wind events in the Aleutians East Borough Planning Area. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in the Aleutians East Borough Planning Area. | It is possible that future climate conditions will influence the location of future drought/water supply events in the Aleutians East Borough Planning Area. | It is unlikely that future climate conditions will influence the location of future extreme cold events in the Aleutians East Borough Planning Area. | It is unlikely that future climate conditions will influence the location of future heavy rain events in the Aleutians East Borough Planning Area. | It is unlikely that future climate conditions will influence the location of future heavy snow events in the Aleutians East Borough Planning Area. | It is unlikely that future climate conditions will influence the location of future high wind events in the Aleutians East Borough Planning Area. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in the Aleutians East Borough Planning Area could increase (UAF/SNAP 2025). | In the Aleutians East Borough, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026). Winter temperatures are increasing the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). Climate change within Alaska is likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In the Aleutians East Borough, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026). Winter temperatures are increasing the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). Specific temperature modelling for each jurisdiction (where available) can be found in the Jurisdictional Annexes. | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in the Aleutians East Borough Planning Area. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP). Extreme precipitation events have occurred throughout Alaska with increasing frequency. In the Aleutians East Borough Planning Area, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>The Aleutians East Borough Planning Area experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months.<br>Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). |
| Impact | Projected increases in precipitation and associated moisture availability in the Aleutians East Borough could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026). Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in the Aleutians East Borough are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities in the Aleutians East Borough (Alaska DHS&EM 2023). | While overall temperature trends in the Aleutians East Borough are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In the Aleutians East Borough Planning Area, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026). | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023). Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir levels. The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in the Aleutians East Borough Planning Area by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in the Aleutians East Borough are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026). In the Aleutians East Borough Planning Area, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In the Aleutians East Borough Planning Area, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in the Aleutians East Borough are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In the Aleutians East Borough Planning Area, winter is likely to have more precipitation (UAF/SNAP 2026). Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in the Aleutians East Borough Planning Area may increase.<br>These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in the Aleutians East Borough Planning Area have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in the Aleutians East Borough Planning Area. | Future conditions of drought are not anticipated to significantly affect population patterns in the Aleutians East Borough Planning Area. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in the Aleutians East Borough Planning Area. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | In the Aleutians East Borough Planning Area, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026). | It is not likely that future conditions influencing heavy snow will impact changes in the Aleutians East Borough Planning Area population patterns. | High-wind events are projected to become more frequent in the future (NOAA 2025). The highest increases are projected to be in the northern and western Alaska coastal regions (AK HMP 2023). |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in the Aleutians East Borough Planning Area. | Future conditions of drought are not anticipated to substantially affect future land use development in the Aleutians East Borough Planning Area. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in the Aleutians East Borough Planning Area, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in the Aleutians East Borough Planning Area population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in the Aleutians East Borough Planning Area land use development. | It is not likely that future conditions of high winds will impact changes in the Aleutians East Borough Planning Area population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources | Future conditions of drought may affect subsistence resources in the Aleutians East Borough Planning Area, particularly berry availability, by | Future conditions of extreme cold may affect subsistence resources in the Aleutians East Borough Planning Area, particularly berry availability, by | It is possible that future conditions of heavy rain will impact changes in the Aleutians East Borough Planning Area land use development. An increase in | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – | It is not likely that future conditions of high winds will impact changes in the Aleutians East Borough |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | in the Aleutians East Borough Planning Area. | influencing plant growth, flowering, and seasonal productivity. Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are milder. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | influencing plant growth, flowering, and seasonal productivity. Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are milder. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | frequency of heavy rains could oversaturate soil on the slopes above the Aleutians East Borough Planning Area, leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to development of landslide monitoring equipment and/or landslide barriers/diversion structures. | such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, thermal stress, and nutrient availability for subsistence species. | Planning Area land use development. |

The University of Alaska Fairbanks's (UAF) Scenarios Network for Alaska and Arctic Planning (SNAP) depicts the Aleutians East Borough Planning Area's historical and future precipitation amounts under a medium emissions (RCP 6.0) scenario. This is shown in Figure 38. In the past 50 years, the annual precipitation change has been +2%.




Source: ACCAP 2026

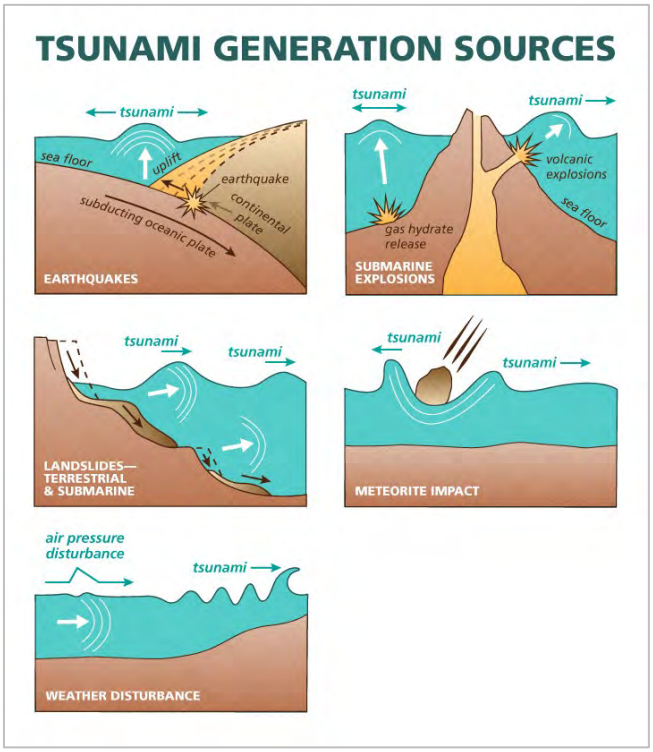
**Figure 38- Alaska Annual Precipitation Change (1976 – 2025)**

## 3.2.10 Tsunami

### 3.2.10.1 Nature

A tsunami is a series of traveling waves of extremely long wavelength and period generated by a sudden vertical displacement of water. This displacement of water can be triggered by underwater volcanic eruptions, large subaerial or submarine landslides, or earthquakes at or below the ocean floor. In Alaska, seismically generated earthquakes near the subduction zone pose the primary tsunami threat to coastal communities. A seiche is an oscillating wave occurring within a partially or totally enclosed water body.

The different types and generation sources of tsunamis are described below:




- **Seismically generated tsunamis** are generated by an earthquake event. Seismically generated tsunamis in Alaska most commonly occur along the subduction zone in the Aleutian Islands. Earthquakes have also generated tsunamis in the back arc area in the Bering Sea and the eastern boundary of the Aleutian Arc plate. Near shore seismic sources generate tsunamis that typically reach land 20 to 45 minutes after the beginning of the earthquake. A distant tsunami can reach land in half a day. Tectonic tsunamis originating in the vicinity of the Aleutian Islands, Alaska Peninsula, and the Gulf of Alaska are of particular concern to Alaskans because waves can reach coastal communities within minutes to hours after the earthquake and may require immediate evacuation.
- **Landslide-generated tsunamis** can be generated by subaerial (land) or submarine (underwater) landslides. Landslides may be triggered by an earthquake, and one earthquake may trigger multiple landslides and resulting tsunamis. These events have the potential to be particularly dangerous because they can form large tsunami events as they possess a large amount of kinetic energy, and they do not typically provide any warning before generating.

  An earthquake usually, but not always, triggers this type of landslide, and they are usually confined to the originating bay or lake location such as the historical 1958 Lituya Bay event and the more recent October 2015 700-foot-high landslide wave Taan Fjord event in Icy Bay.

  The August 2025 Tracy Arm landslide resulted in a tsunami at least 100-foot-high at Sawyer Island and runup height of 1,500-1,600 feet opposite the landslide.

  Subaerial landslides can be initiated in slopes already on the verge of movement by rainfall, snowmelt, changes in water level, stream land destabilization, changes in ground water, earthquakes, volcanic activity, disturbance by human activities, or any combination of these factors.
- **Volcanic-generated tsunamis** are the least common type of tsunamis in Alaska, as only one volcanic eruption event that generated a tsunami has been confirmed in the state. In 1883, the Saint Augustine volcano triggered a tsunami when the north side of the mountain collapsed. The resulting tsunami inundated Port Graham with waves that were 30 feet high. On January 15, 2022, a large submarine volcano in Tonga erupted, which triggered a widespread Pacific-wide tsunami. The eruption was detected throughout parts of Alaska, as far north as Fairbanks, nearly 6,000 miles away. The National Tsunami Warning Center issued a tsunami advisory for much of the Alaskan coastline, as unusual and strong currents with waves up to 3 feet were predicted. The community

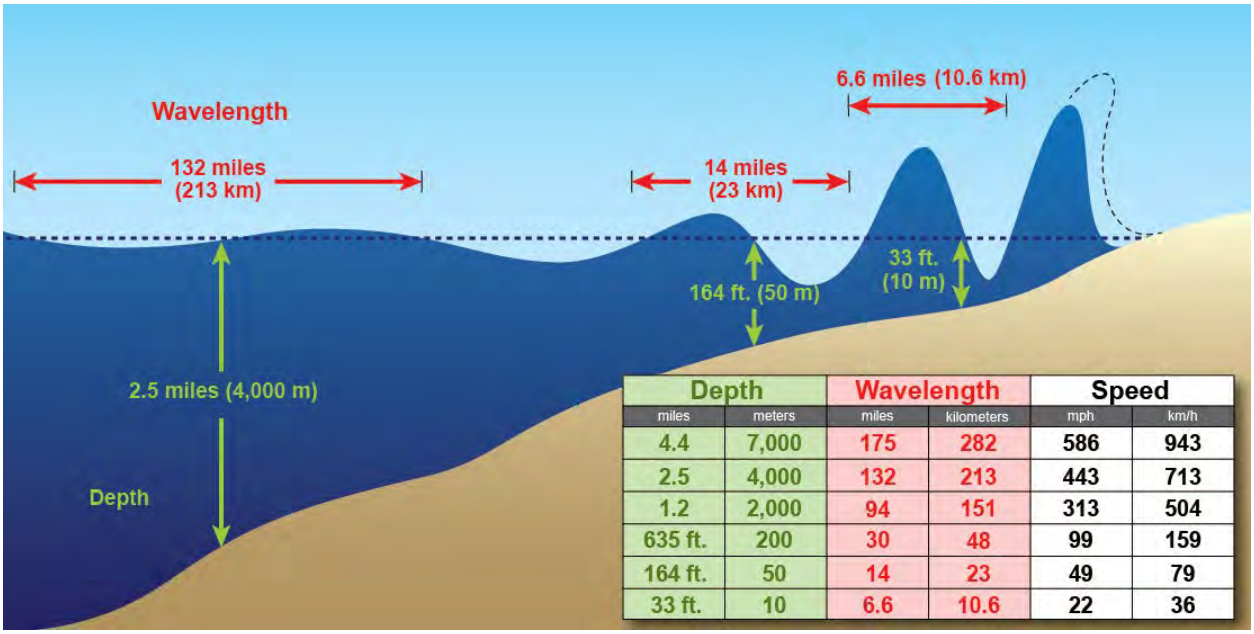
of King Cove recorded waves of just over 2 feet, but no significant damage was reported. The National Tsunami Warning Center stated that an evacuation warning would have been issued if waves reached 3.2 feet.

- **Teletsunamis**, also called **ocean-wide tsunamis** or **distant tsunamis**, originate at a distant location, and are observed at or impact locations 620 miles (>1,000 km) away or over 3 hours travel time from their source. In many cases, tele-tsunamis can allow for sufficient warning time and evacuation. There is a slight risk in the western Aleutians and some parts of Southeast Alaska. Most tele-tsunamis that reached Alaska have not caused damage. Massacre Bay on Attu Island has historically received tele-tsunamis with less than one-ft recorded amplitudes. The 1960 Chilean tsunami caused damage to pilings at MacLeod Harbor, Montague Island (Prince William Sound area) and on Cape Pole, Kosciusko Island (southeast Alaska) where a log boom broke free.
- **Seiche** waves oscillate in partially or totally enclosed water bodies. They are caused by earthquakes, underwater landslides, atmospheric disturbances, or avalanches and can last from a few minutes to a few hours. The first wave can occur within a few minutes, giving virtually no warning time. The resulting effect is like bathtub water sloshing repeatedly from side to side. The reverberating water continually causes damage until the activity subsides. The factors for effective warning are like a local tsunami. Communities near large lakes, such as Lake Iliamna, may be vulnerable to seiche activity following an earthquake.

Many tsunamis are often undetected because of their long wavelengths. Some wavelengths are hundreds of miles long and only 3 feet high and cannot be felt by mariners as it passes beneath their vessel. The wavelength of the tsunami waves and their period will depend on the generating mechanism and the dimensions of the source event. If the tsunami is generated from a large earthquake over a large area, its initial wavelength and period will be greater. If the tsunami is caused by a local landslide, both its initial wavelength and period will be shorter.

The speed that a tsunami will travel will depend on the depth of the water it is travelling through. The tsunami will travel faster in deeper water and will begin to slow down once the depth of the water decreases. In the deep ocean, they can travel at speeds over 500 mph and have the capacity to cross entire oceans in one day.

As a tsunami enters shallow waters and nears land, it begins to slow down, the wavelengths decrease, waves grow in height, and currents intensify (Figure ). Once the tsunami makes landfall, its speeds slow down to 20-30 mph.




| Depth | | Wavelength | | Speed | |
|---|---|---|---|---|---|
| miles | meters | miles | kilometers | mph | km/h |
| 4.4 | 7,000 | 175 | 282 | 586 | 943 |
| 2.5 | 4,000 | 132 | 213 | 443 | 713 |
| 1.2 | 2,000 | 94 | 151 | 313 | 504 |
| 635 ft. | 200 | 30 | 48 | 99 | 159 |
| 164 ft. | 50 | 14 | 23 | 49 | 79 |
| 33 ft. | 10 | 6.6 | 10.6 | 22 | 36 |

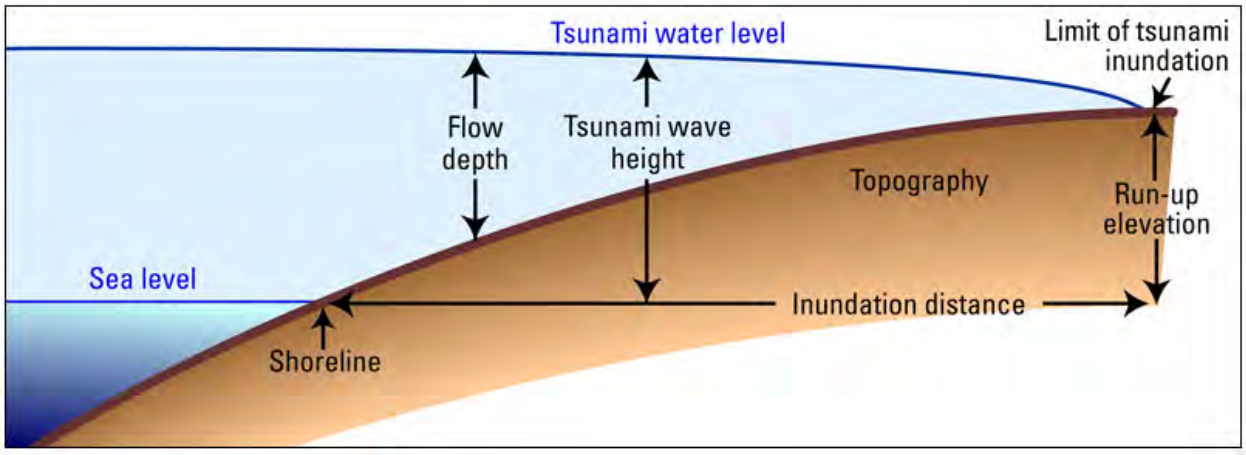
Source: NWS 2026

**Figure 39- Cross Section of a Tsunami Propagation**

Some terms commonly used when describing tsunamis are below.

- **Inundation:** The horizontal distance inland that a tsunami penetrates, generally measured perpendicularly to the shoreline.
- **Inundation line:** Inland limit of wetting, measured horizontally from the mean sea level (MSL) line. The line between living and dead vegetation is sometimes used as a reference. In tsunami science, the landward limit of tsunami runup.
- **Runup:** Difference between the elevation of maximum tsunami penetration (inundation line) and the sea level at the time of the tsunami. In practical terms, runup is only measured where there is clear evidence of the inundation limit on the shore.

  Elevation reached by seawater measured relative to some stated datum such as mean sea level, mean low water, sea level at the time of the tsunami, etc., and measured ideally at a point that is a local maximum of the horizontal inundation. Where the elevation is not measured at the maximum of horizontal inundation this is often referred to as the inundation-height.
- **Run-up elevation:** The elevation above sea level of a tsunami at the limit of penetration
- **Flow depth:** Flow depth relates to the depth of the water from a tsunami, measured on shore in different locations; flow direction relates to the direction of this flow.
- **Tsunami wave height:** Difference between the elevation of the highest local water mark and the elevation of the sea level at the time of the tsunami. This is different from maximum runup because the water mark is often not observed at the inundation line, but maybe halfway up the side of a building or on a tree trunk.



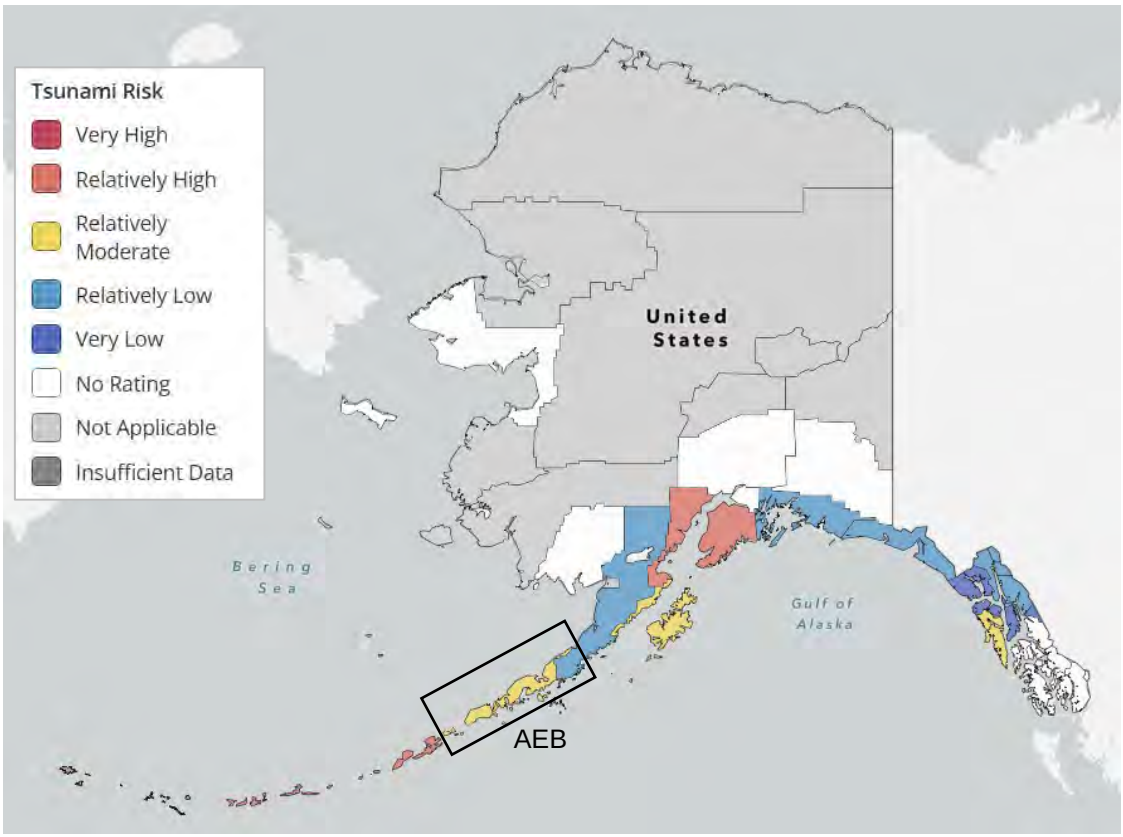

Source: USGS 2010

**Figure 40- Illustration of Common Tsunami Terms**

### 3.2.10.2 Location

Impacts from a tsunami could impact all low-lying areas in the Aleutians East Borough Planning Area. Secondary hazard impacts could occur after a tsunami in areas outside of tsunami risk- such as landslide and sediment deterioration and land destabilization. See Sections 3.2.5 and 3.2.8 and for more information on these hazards.

FEMA's National Risk Index provides the following map for Tsunami Risk in Alaska (Figure 41). The tsunami risk for the Aleutians East Borough Planning Area is labeled as Relatively Moderate.




Source: FEMA 2025- National Risk Index (Tsunami)

**Figure 41- Alaska Tsunami Risk Map**

The Alaska Tsunami Inundation Mapping Program, conducted in partnership with the Alaska Division of Geological & Geophysical Surveys (DGGS), Alaska Earthquake Center (AEC), and the Alaska Division of Homeland Security and Emergency Management (DHS&EM), develops tsunami inundation maps using numerical modeling of tsunami wave dynamics. Funded by the National Tsunami Hazard Mitigation Program, the program provides communities, officials, and residents with science-based information to identify and address tsunami hazards. Mapping priorities consider tsunami exposure, location, infrastructure, available data, and community commitment to hazard mitigation planning. Maps reflect the best available tsunami science at the time of publication.

DGGS maintains a repository of tsunami inundation mapping and publications on their website: https://dggs.alaska.gov/pubs/tsunami.

***In the Aleutians East Borough, tsunami inundation mapping is available for the communities of Akutan, Cold Bay, False Pass, King Cove, Sand Point, and Nelson Lagoon. Inundation mapping is not available for Belkofski Village, Pauloff Harbor Village, or Unga Village.***

### 3.2.10.3 History

The Aleutians East Borough is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. The NOAA National Centers for Environmental Information (NCEI) lists the following earthquake-generated tsunamis with observed or measured runup waves throughout the Aleutians East Borough Planning Area (Table 16).

**Table 16- Historic Tsunami Runup Events in the Aleutians East Borough (1788-7/31/2026)**

| Date | Location | Latitude | Longitude | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 1788-07-21 | Pavlof Village | 55.490 | -161.46 | 8.0 | 16.40 |
| 1788-07-21 | Sanak Island | 54.43 | -162.7 | 8.0 | 98.43 |
| 1788-07-21 | Unga Island | 55.26 | -160.68 | 8.0 | 98.43 |
| 1788-08-06 | Unga Island | 55.26 | -160.68 | 8.0 | 288.71 |
| 1788-08-06 | Sanak Island | 54.43 | -162.7 | 8.0 | 98.43 |
| 1788-08-06 | Pavlof Village | 55.49 | -161.46 | 8.0 | 16.40 |
| 1825-03-21 | Unimak Island | 54.77 | -164.18 | Unknown | Unknown |
| 1827-08-08 | Chernabura Island | 54.78 | -159.55 | Unknown | Unknown |
| 1856-07-26 | Unimak Island | 54.77 | -164.18 | Unknown | Unknown |
| 1868-05-15 | Unga Island | 55.26 | -160.68 | Unknown | 20.01 |
| 1929-03-07 | Cherni and Fox Islands | 54.63 | -162.37 | 7.8 | 3.28 |
| 1946-04-01 | Ikatan | 54.77 | -163.18 | 8.6 | Unknown |
| 1946-04-01 | Unimak Island | 54.77 | -164.18 | 8.6 | 114.99 |
| 1946-04-01 | Cold Bay | 55.183 | -162.717 | 8.6 | 20.01 |
| 1946-04-01 | King Cove | 55.062 | -162.31 | 8.6 | 4.92 |
| 1946-04-01 | Sanak Island | 54.43 | -162.7 | 8.6 | 20.01 |
| 1946-04-01 | Sand Point | 55.337 | -160.502 | 8.6 | Unknown |
| 1946-04-01 | Unga Island | 55.19 | -160.51 | 8.6 | 2.62 |
| 1946-04-01 | Scotch Gap, Unimak Island | 54.3944 | -164.741 | 8.6 | 137.80 |
| 1946-04-01 | Ikatan, Unimak Island | 54.75 | -163.319 | 8.6 | 21.98 |
| 1946-04-01 | NW Scotch Gap, Unimak Island | 54.42 | -164.84 | 8.6 | 24.93 |
| 1946-04-01 | S Sennet Point, Unimak Island | 54.4785 | -164.9 | 8.6 | 138.45 |
| 1946-04-01 | Seal Cape, Unimak Island | 54.309 | -164.646 | 8.6 | 130.58 |
| 1946-04-01 | NE Arch Point, Unimak Island | 54.4162 | -164.55 | 8.6 | 48.88 |
| 1946-04-01 | Promontory Hill, Unimak Island | 54.43227 | -164.48651 | 8.6 | 39.70 |
| 1946-04-01 | Cape Lutke, Unimak Island | 54.501 | -164.34 | 8.6 | 57.74 |
| 1946-04-01 | Promontory Cove, Unimak Island | 54.5212 | -164.356 | 8.6 | 45.28 |
| 1946-04-01 | Unimak Island | 54.573 | -164.301 | 8.6 | 89.24 |
| 1946-04-01 | NW Cape Rukavitsie, Unimak Island | 54.639 | -164.04 | 8.6 | 77.10 |
| 1946-04-01 | Brown Peak, Unimak Island | 54.633 | -163.72 | 8.6 | 114.17 |

| Date | Location | Latitude | Longitude | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 1946-04-01 | Lazeref Peak, Unimak Island | 54.6338 | -163.531 | 8.6 | 136.48 |
| 1946-04-01 | E Salmon Bay, Sanak Island | 54.389 | -162.578 | 8.6 | 56.10 |
| 1946-04-01 | SE Sandy Bay, Sanak Island | 54.377 | -162.641 | 8.6 | 43.31 |
| 1946-04-01 | Sandy Bay, Sanak Island | 54.396 | -162.669 | 8.6 | 41.99 |
| 1946-04-01 | SE Clifford Island | 54.3747 | -162.769 | 8.6 | 35.43 |
| 1946-04-01 | SW Clifford Island | 54.385 | -162.782 | 8.6 | 53.81 |
| 1946-04-01 | Long Island | 54.402 | -162.843 | 8.6 | 24.28 |
| 1957-03-09 | Scotch Gap | 54.42 | -164.73 | 8.6 | 59.71 |
| 1985-03-03 | Sand Point | 55.337 | -160.502 | 8 | 25.59 |
| 1986-05-07 | Sand Point | 55.337 | -160.502 | 8 | 21.00 |
| 1989-09-04 | Sand Point | 55.337 | -160.502 | 7.1 | 21.98 |
| 1995-07-30 | Sand Point | 55.337 | -160.502 | 8 | 20.34 |
| 1996-06-10 | Sand Point | 55.337 | -160.502 | 7.9 | 50.20 |
| 2001-06-23 | Sand Point | 55.337 | -160.502 | 8.4 | 25.59 |
| 2003-11-17 | Sand Point | 55.337 | -160.502 | 7.8 | 52.82 |
| 2004-12-26 | Sand Point | 51.251 | -178.715 | 9.1 | 54.46 |
| 2006-05-03 | King Cove | 55.06 | -162.324 | 8 | 38.71 |
| 2006-05-03 | Sand Point | 55.337 | -160.502 | 9.1 | 80.71 |
| 2006-11-15 | Sand Point | 55.337 | -160.502 | 8.3 | 50.00 |
| 2006-11-15 | King Cove | 55.06 | -162.324 | 8.3 | 0.26 |
| 2007-08-15 | Sand Point | 55.337 | -160.502 | 8 | 0.16 |
| 2009-09-29 | King Cove | 55.06 | -162.324 | 8.1 | 0.33 |
| 2010-02-27 | King Cove | 55.06 | -162.324 | 8.8 | 0.36 |
| 2010-02-27 | Sand Point | 55.337 | -160.502 | 8.8 | 0.16 |
| 2010-02-27 | Akutan | 54.133 | -165.778 | 8.8 | 0.39 |
| 2011-03-11 | Sand Point | 55.337 | -160.502 | 9.1 | 0.13 |
| 2011-03-11 | King Cove | 55.06 | -162.324 | 9.1 | 0.46 |
| 2011-03-11 | Port Moller | 55.99 | -160.58 | 9.1 | 0.23 |
| 2011-06-24 | Akutan | 54.133 | -165.778 | 7.3 | 0.16 |
| 2012-10-28 | Sand Point | 55.337 | -160.502 | 7.7 | 0.36 |
| 2013-02-06 | Sand Point | 55.337 | -160.502 | 7.9 | 0.66 |
| 2014-04-01 | Akutan | 54.133 | -165.778 | 8.2 | 0.13 |
| 2014-04-01 | Sand Point | 55.337 | -160.502 | 8.2 | 0.43 |

| Date | Location | Latitude | Longitude | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 2014-04-01 | King Cove | 55.06 | -162.324 | 8.2 | 2.07 |
| 2015-09-16 | Sand Point | 55.337 | -160.502 | 8.3 | 1.25 |
| 2015-09-16 | King Cove | 55.06 | -162.324 | 8.3 | 0.72 |
| 2015-09-16 | Akutan | 54.133 | -165.778 | 8.3 | 2.00 |
| 2020-07-22 | Sand Point | 55.337 | -160.502 | 7.8 | 1.77 |
| 2020-10-19 | Sand Point | 55.337 | -160.502 | 7.6 | 0.49 |
| 2020-10-19 | King Cove | 55.06 | -162.324 | 7.6 | 0.13 |
| 2021-03-04 | Sand Point | 55.337 | -160.502 | 8.1 | 0.20 |
| 2021-07-29 | Sand Point | 55.337 | -160.502 | 8.2 | 0.36 |
| 2021-07-29 | King Cove | 55.06 | -162.324 | 8.2 | 0.16 |
| 2021-07-29 | Range Island | 55.354 | -160.504 | 8.2 | 0.30 |
| 2021-08-12 | King Cove | 55.06 | -162.324 | 8.1 | 0.33 |
| 2021-08-12 | Sand Point | 55.337 | -160.502 | 8.1 | 0.62 |
| 2022-01-15 | King Cove | 55.06 | -162.324 | Unknown | 0.85 |
| 2022-01-15 | Sand Point | 55.337 | -160.502 | Unknown | 0.23 |
| 2023-07-16 | King Cove | 55.06 | -162.324 | 7.2 | 0.79 |
| 2023-07-16 | Sand Point | 55.337 | -160.502 | 7.2 | 2.30 |
| 2025-07-16 | Sand Point | 55.337 | -160.502 | 7.3 | 2.10 |
| 2025-07-16 | King Cove | 55.06 | -162.324 | 7.3 | 0.52 |
| 2025-07-29 | Sand Point | 55.337 | -160.502 | 8.8 | 1.35 |
| 2025-07-29 | King Cove | 55.06 | -162.324 | 8.8 | 0.72 |

Source: NCEI 2026

Local and Tribal oral histories provide an additional record of past tsunami events, helping document how tsunami inundation was experienced and remembered in coastal communities where instrumental measurements or detailed historical records may be limited.

**1788 Earthquakes and Tsunamis**

According to records kept by Russian explorers and written testimonies cited later by Russian Bishop Ivan Veniaminov, during the summer of 1788, the Aleutian Islands saw two massive, tsunami-producing megathrust earthquakes (estimated at magnitudes of 8.0 to 8.9).

According to the most reliable documentation, the first tsunami occurred on July 21, coinciding with a major earthquake of magnitude 8 or greater, and the second one 16 days later, on August 6. The second tsunami was the highest, reaching maximum runup heights between 50 m and 90 m, and even over 100 m, on Unga Island and Sanak Islands, according to various accounts (Ferrer and Gonzalex-de-Vallejo 2024). There is no direct evidence of these maximum heights, as the data comes from oral references transcribed and translated from original Russian descriptions.

Repeated tsunamis were characteristic of the 1788 earthquakes, indicating an offshore location for these shocks. That people ran inland when the sea withdrew from the shore. Even so, not everyone survived.

Writing in 1840, Bishop Veniaminov cited stories about how the flood at Sanak Island "*preceded as strong and infrequent walls*."

Bishop Veniaminov also cited a report stating, "*on 11 July 1788...on Unga [Island] there was such a strong earthquake that it was difficult to stand up, many landslides fell, and after a time a terrible flood occurred*" (UAF Geophysical Institute 1980).

**April 1946 Aleutian Islands Earthquake and Tsunami**

The 1946 Aleutian Islands earthquake and tsunami struck on April 1, 1946, triggered by a powerful magnitude 8.6 undersea earthquake in the Aleutian Trench off Unimak Island, Alaska, which sent devastating Pacific-wide waves that resulted in a handful of deaths in Alaska and 159 deaths in Hilo, Hawaii.

The tsunami completely obliterated the steel-reinforced concrete Scotch Cap Lighthouse on Unimak Island (in the Aleutians East Borough) and killed all five Coast Guard keepers (National Coast Guard Museum 2024). Run-up heights locally reached up to 138 feet (42 meters).



Source: National Coast Guard Museum 2024

**Figure 42- Scotch Cap Lighthouse: Before and After the 1946 Tsunami**

### 3.2.10.4 Extent (Magnitude and Severity)

DGGS has a library of tsunami inundation maps for many coastal communities that are threatened by tsunamis. The maximum estimated tsunami inundation and maximum flow depths in the Aleutians East Borough Planning Area are shown in the Jurisdictional Annexes. This map combines the maximum inundation for both seismically generated and landslide induced tsunamis.

**The extent of past tsunami events in the Aleutians East Borough Planning Area have resulted in tsunami runup events of less than 1 foot to over 150 feet (NCEI 2026). The highest recorded runup was 288 feet on Unga Island in 1788.** *Note: the data comes from oral references transcribed and translated from original Russian descriptions- actual runup heights are not available and may differ from oral references.*

**The 1946 Unimak Island earthquake and tsunami event resulted in tsunami runup of over 138 feet and resulted in over 160 deaths, primarily in Hilo, Hawaii.**

In addition to seismically generated tsunamis, landslide induced tsunamis are potentially a risk to the Aleutians East Borough Planning Area as well. However, greater study of the geology and underwater sediments are needed to properly identify unstable sediments.

Based on historical events, available inundation mapping, and the criteria identified in Table 4, the extent of tsunamis in the Aleutians East Borough Planning Area is considered is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

### 3.2.10.5 Impact

Potential impacts from a tsunami will vary and are dependent on many factors, but impacts range from barely detectable to completely destructive. Tsunamis influence beaches once they hit the shore, and may also affect mouths of bays, tidal flats, and the shoreline of large coastal rivers. Tsunamis can diffract around islands and land masses and since they are asymmetrical, the waves may be much stronger in one direction than the other, further affecting the surrounding coastal features.

| Description of Impacts | |
|---|---|
| Geography/Land | Previous impacts from tsunamis on the land or geography include inundation as deep as 280 feet in the Aleutians East Borough. Inundation of coastal areas is possible in the future, which could change shorelines. |
| Infrastructure | In recent history, there are no previous reported impacts that have impacted infrastructure in the Aleutians East Borough. The 1946 Unimak Island earthquake and tsunami event resulted in the destruction of the Scotch Cap Lighthouse on Unimak Island, along with the death of 5 Coast Guard keepers.<br>A tsunami could cause flood damage to coastal structures, and the force of the wave could damage walls, boat harbors, and other coastal infrastructure. |
| People | The 1946 Unimak Island earthquake and tsunami event resulted in tsunami runup of over 138 feet and resulted in deaths of 5 Coast Guard keepers at the Scotch Cap Lighthouse on Unimak Island.<br>In the future, people could drown, suffer hypothermia, or injure themselves if caught in a tsunami wave. |
| Utilities | There have been no recorded utility disruptions due to tsunamis in the Aleutians East Borough. A tsunami could damage underwater cables, sewer and water lines, and utility poles. |
| Transportation | There have been no recorded impacts to transportation systems due to a tsunami in the Aleutians East Borough. Potential inundation of roadways and airport runways could limit or delay land and air travel, while damage to boat harbors, vessels, and other marine transportation infrastructure could impede travel by water. |
| Economy | There have been no reported economic impacts due to tsunamis in the Aleutians East Borough. |
| Subsistence Resources | There have been no recorded impacts on subsistence resources due to tsunamis in the Aleutians East Borough. A tsunami could limit access to subsistence fishing grounds during and after an event, or damage land resources if they are inundated. |

### 3.2.10.6 Probability of Future Events

Based on FEMA's Tsunami Risk Map, DGGS inundation mapping, historical events, and the criteria identified in Table 5, it is **Likely** that the Aleutians East Borough Planning Area will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

### 3.2.10.7 Future Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in the Aleutians East Borough Planning Area is not anticipated to change in the future. |
| Location | The location of tsunami events in the Aleutians East Borough Planning Area is not anticipated to change in the future. All low-lying coastal areas in Aleutians East Borough will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in the Aleutians East Borough Planning Area. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in the Aleutians East Borough Planning Area, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in the Aleutians East Borough Planning Area could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in the Aleutians East Borough Planning Area, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in the Aleutians East Borough Planning Area, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources. |

## 3.2.11 Volcano

### 3.2.11.1 Nature

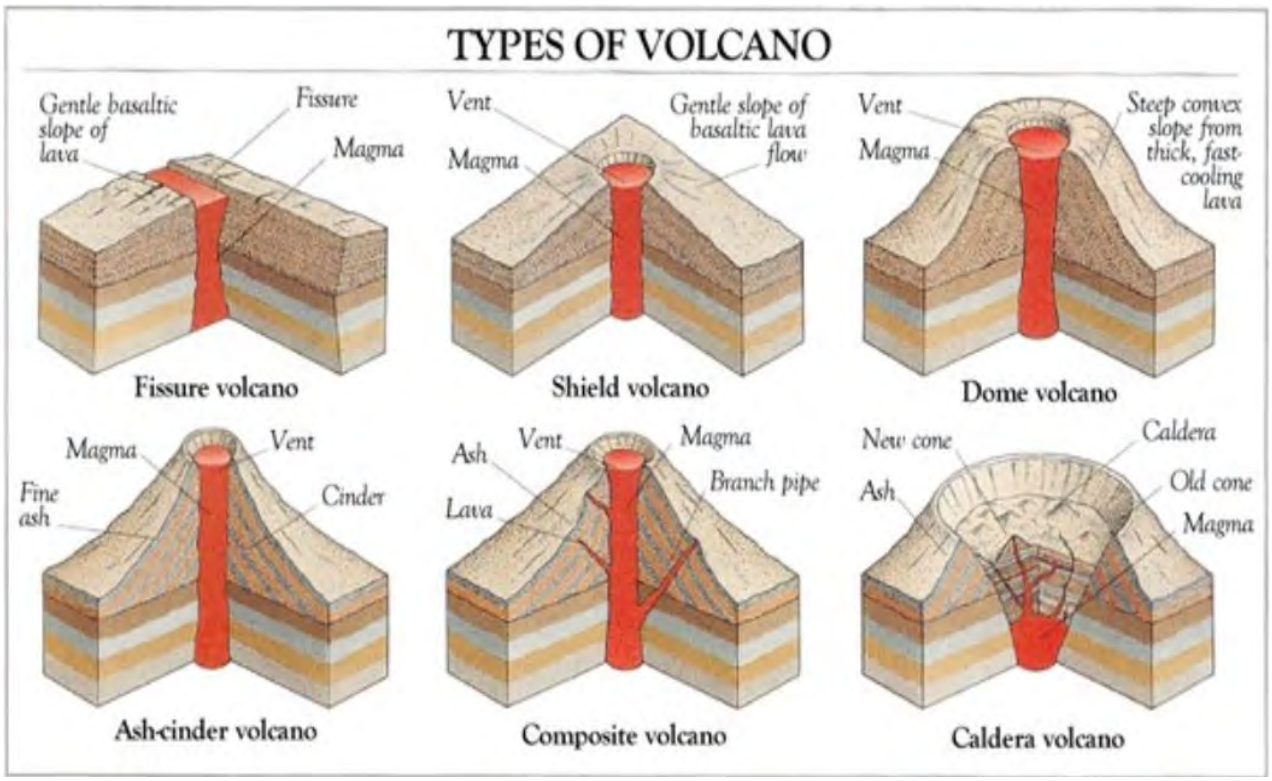
A volcano is a vent or opening in the earth's crust from which molten lava (magma), pyroclastic materials, and volcanic gases escape and erupt. Volcanoes can unleash cataclysmic destructive power greater than nuclear bombs and can pose serious hazards if they erupt near populated regions (USGS 2026).

The National Park Service (NPS) describes the various types of volcanoes in the table below. The United States Geological Survey (USGS) describes four main groupings of volcanos: Cinder Cone, Composite (Stratovolcano), Shield, and Lava Dome that can contain more than one aspect of these classifications. For example, Aniakchak is a stratovolcano that includes cinder cones and lava domes (AVO 2026).

| Volcano Type | Characteristics |
|---|---|
| Fissure | Fissure volcanoes are produced by eruptions that occur along elongated fissures rather than at a central vent, thus releasing large volumes of fluid basaltic lava. Fissure eruptions frequently occur in monogenetic volcanic fields and may also occur in rift zones on shield volcanoes (NPS 2022a). Fissure eruptions typically produce liquid flows, but pyroclastics may also be ejected (AVO 2023).<br>Fissure volcanoes are most often associated with oceanic ridges on diverging plate boundaries and can occur on land as well.<br>In Alaska, the Aleutian Islands are home to several volcanoes that have been known to produce fissure volcanoes, like Mount Gareloi, of which the 1929 eruption produced several blocky lava flows (AVO 2026). |
| Shield | Shield volcanoes are gently sloping, convex shaped volcanic cones that are flatter near the summit (NPS 2022a). They are built over vast periods of time (up to a million years or longer) and with repeated eruptions. These volcanoes are much wider than they are tall and are the largest volcanoes on Earth- typically encompassing several tens to hundreds of square miles.<br>In Alaska, shield volcanoes can be found at Wrangell-St. Elias National Park and Preserve and Bering Land Bridge National Preserve. |
| Dome | Dome volcanoes, sometimes referred to as lava domes, are formed by viscous magma being erupted effusively onto the surface and then piling up around the vent (NPS 2022a). These volcanoes are steep-sided and typically form in clusters. Most dome volcanoes are relatively small and have a limited volume of viscous lava.<br>Dome eruptions are usually non-explosive, but growing domes may collapse to produce explosive eruptions and pyroclastic flows (NPS 2022a). They may collapse when they become over-pressured from gases trapped inside or become over-steepened.<br>In Alaska, dome volcanoes can be found at Katmai National Park, Lake Clark National Park and Preserve, Wrangell-St. Elias National Park and Preserve, and Aniakchak National Monument. |
| Cinder Cone | Cinder cone (monogenetic) volcanoes, historically called Ash-cinder, are the most common type of volcanoes in the world. Cinder cones that form over a linear fissure vent are elongated, and ones that form in areas with strong prevailing winds may be much taller on the downwind side. Elongated cinder cones may also form when the location of the vent shifts during the eruption (NPS 2022a). These volcanoes frequently have an asymmetric shape and are typically a few hundred feet tall but rarely get taller than 600 to 900 feet.<br>Because cinder cones are usually monogenetic, there should not be a risk of eruption at an existing cinder cone. However, a new cinder cone may form nearby during an eruption (NPS 2022a). Precursors to cinder cone eruptions include earthquakes and rumblings near the volcano. |

| Volcano Type | Characteristics |
|---|---|
| | In Alaska, cinder cone volcanoes can be found at Katmai National Park, Wrangell-St. Elias National Park and Preserve, Bering Land Bridge National Preserve, and Aniakchak National Monument. |
| Composite (Strato-volcano) | A composite volcano, commonly referred to as a stratovolcano, is conical with a concave shape that is steeper near the top. These mountains commonly have snow-covered peaks and stand high above the surrounding mountainous terrain (NPS 2022a).<br>These volcanoes are complex because they experience multiple eruptions that can vary in eruption type and erupt lavas with a range of compositions. They may have multiple vents, but most composite volcanoes have a main vent at the summit (NPS 2022a). Like mountains, composite volcanoes are subject to the forces of land destabilization.<br>In Alaska, composite (strato) volcanoes can be found at Katmai National Park, Lake Clark National Park and Preserve, Wrangell-St. Elias National Park and Preserve, and Aniakchak National Monument. |
| Caldera | Caldera volcanoes are formed during large-volume volcanic eruptions when the underlying magma chamber is partially emptied and the ground above it subsides into it (NPS 2022a). Calderas are large volcanoes, typically larger than 0.6 miles in diameter, and their diameters are much wider than their included vents. Caldera volcanoes can be either explosive or nonexplosive (NPS 2022a).<br>• Explosive calderas form during eruptions of silicic magmas that emit large-volume ash-flow tuffs and form Ultra-Plinian eruptive columns. The different types of explosive calderas vary in size, eruption magnitude, diameter, age, and whether they formed at summit of a preexisting volcano.<br>• Nonexplosive calderas form on the summit of shield volcanoes during especially large eruptions of lava flows at either the summit or along flank rift zones. Shield volcanoes can experience several cycles of caldera collapse and subsequent infilling by lava flows.<br>In Alaska, caldera volcanoes can be found at Katmai National Park, Wrangell-St. Elias National Park and Preserve, Bering Land Bridge National Preserve, and Aniakchak National Monument. |

Figure 43 depicts these volcano types.




Source: AP ES 2026

**Figure 43 – Types of Volcanoes**

As there are many types of volcanoes, there are different types of volcanic eruptions. Some volcanoes may exhibit only one type of eruption during an event, while others may display an entire sequence of all three types in one event. These eruption classifications are described below.

| Type of Volcanic Eruption | Characteristics |
|---|---|
| Magmatic | Magmatic eruptions are the most well-observed eruptions. Magmatic eruptions include the ejection of lava or tephra from a magma source within the earth. There is a significant range in the intensity, magnitude, explosivity, eruption rate, and amount of magma erupted during magmatic eruptions (NPS 2022b).<br>Magmatic eruptions are generally described as being effusive or explosive.<br>• Effusive eruptions are dominated by passive emission of lava.<br>• Explosive eruptions are dominated by eruption of fragmental (pyroclastic) material. |
| Phreatomagmatic (Hydrovolcanic) | Phreatomagmatic eruptions are volcanic eruptions resulting from the interaction between magma and water. These eruptions are violently explosive and driven by steam explosions produced by the interaction of hot magma with surface water or shallow groundwater (NPS 2022b). Hydrovolcanic eruptions include tephra derived from juvenile magma. |
| Phreatic | Phreatic eruptions are driven by steam explosions due to the superheating of groundwater by a magmatic source. These eruptions blast out steam, water, ash, volcanic bombs, and volcanic blocks, but no new magma (NPS 2022b).<br>The 2006 phreatic eruption of the Fourpeaked Volcano in Katmai National Park and Preserve sent an ash cloud 20,000 feet into the atmosphere (NPS 2022b). |

Alaska Division of Geological and Geophysical Surveys (DGGS) describes eruptions from the hazard perspective: Effusive, Explosive, or both. Effusive eruptions erupt mostly lava, which poses ground hazards where the lava flows. Explosive eruptions erupt volcanic ash (tephra) and may also produce pyroclastic flows and mudflows, posing hazards to aviation as well as the ground. In Alaska, the dominant volcanic hazards are posed by volcanic ash.

Volcanoes are also categorized according to the age of their eruptive activity. Active volcanoes are those that are currently erupting or showing signs of unrest, such as unusual earthquake activity or significant new gas emissions. Dormant volcanoes are those that are not currently active but could become restless or erupt again. Extinct volcanoes are those that are considered unlikely to erupt again. This can be difficult to determine as a volcano could go tens of thousands of years, or longer, between eruptions.

The Alaska Volcano Observatory classifies volcanoes as: recent (last 300 years); active in the Holocene (11,700 years ago); and active within the last 2 million years, but not within the last 10,000 years.

Alaska contains about 140 volcanoes and volcanic fields which have been active within the last two million years. Of these volcanoes, about 90 have been active within the last 10,000 years (and might be expected to erupt again), and more than 50 have been active in the past 300 years (AVO 2026).

The Alaska Volcano Observatory uses the USGS alert-level system for volcanic activity, which has two parts: 1. Ranked terms to inform people on the ground about a volcano's status. 2. Ranked colors to inform the aviation sector about airborne ash hazards.

**Table 17- Volcano Alert Levels**

| Alert Level Terms | When the volcano alert-level is changed, a Volcano Activity Notice (VAN) is issued. |
|---|---|
| NORMAL | Volcano is in typical background, noneruptive state<br>or, after a change from a higher level,<br>volcanic activity has ceased, and volcano has returned to noneruptive background state. |
| ADVISORY | Volcano is exhibiting signs of elevated unrest above known background level<br>or, after a change from a higher level,<br>volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase. |
| WATCH | Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertain,<br>OR<br>eruption is underway but poses limited hazards. |
| WARNING | Hazardous eruption is imminent, underway, or suspected. |

Source: Alaska Volcano Observatory 2026

**Table 18- Volcano Aviation Color Codes**

| Aviation Color Codes | When the volcano alert-level is changed, a Volcano Observatory for Aviation Notice (VONA) is issued. |
|---|---|
| UNASSIGNED | Ground-based instrumentation is insufficient to establish that a volcano is in a typical background level (GREEN / NORMAL).<br>When activity at such a volcano increases to the point of being detected by remote sensing, distant seismic networks, or eyewitness reports, an alert level and color code are then assigned accordingly.<br>When activity decreases, the volcano goes back to UNASSIGNED without going through GREEN / NORMAL. |

| Aviation Color Codes | When the volcano alert-level is changed, a Volcano Observatory for Aviation Notice (VONA) is issued. |
|---|---|
| GREEN | Volcano is in typical background, noneruptive state or, after a change from a higher level, volcanic activity has ceased and volcano has returned to noneruptive background state. |
| YELLOW | Volcano is exhibiting signs of elevated unrest above known background level or, after a change from a higher level, volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase. |
| ORANGE | Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertain,<br>OR<br>eruption is underway with no or minor volcanic-ash emissions [ash-plume height specified, if possible]. |
| RED | Eruption is imminent with significant emission of volcanic ash into the atmosphere likely<br>OR<br>eruption is underway or suspected with significant emission of volcanic ash into the atmosphere [ash-plume height specified, if possible]. |

Source: Alaska Volcano Observatory 2026

#### 3.2.11.2 Location

According to the Alaska Volcano Observatory (AVO), Alaska has about 140 volcanoes and volcanic fields which have been active within the last two million years (AVO 2026). Of these 140 volcanoes and volcanic fields, about 90 of them have been active within the last 11,000 years and may erupt again. More than 50 volcanoes out of the total 140 have been active since year 1760 (AVO 2026). Alaska's volcanoes make up over three-quarters of U.S. volcanoes that have erupted in the last two hundred years.

Since 1900, Alaska has maintained an average of 1-2 volcanic eruptions per year (AVO 2026).

Most of Alaska's volcanoes are located along the Aleutian volcanic arc, which includes the Aleutian Islands and the Alaska Peninsula. Most of the Aleutians East Borough Planning Area lies within this volcanic region.

According to AVO, there are 7 volcanoes in the Aleutians East Borough that are listed as recently active (AVO 2026). The volcanoes, along with their most recent eruption date are Mount Pavlof (2021), Mount Dutton (1988), Mount Isanotski, Mount Shishaldin (2023), Mount Fisher (1830), Mount Westdahl (1991), and Mount Akutan (1992).

***The primary hazard to the Aleutians East Borough Planning Area from a volcanic eruption is volcanic ashfall.***

The 2023 State of Alaska HMP identifies statewide volcanic ash hazard areas. The majority of the Aleutians East Borough Planning Area is located in a moderate volcanic ash hazard area with Nelson Lagon located in a high volcanic ash hazard area.

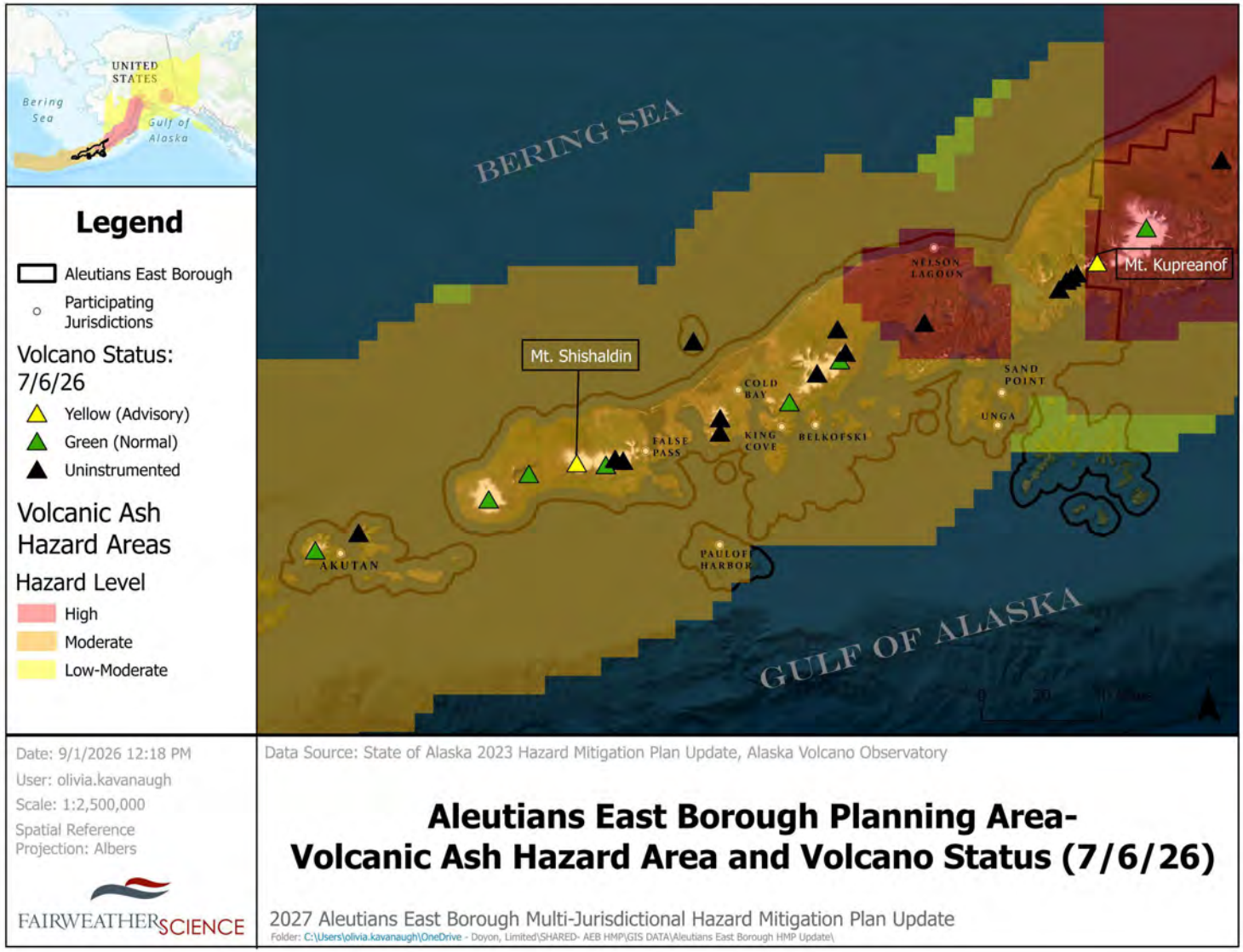



**Figure 44- AEB Planning Area Volcanic Ash Hazard Area and Volcano Status (7/6/26)**

### 3.2.11.3 History

The Aleutians East Borough Planning Area has had a storied history of volcanic eruptions that have impacted the surrounding communities. The following volcanoes have had eruptions that have impacted the Aleutians East Borough Planning Area:

**Mount Shishaldin** is one of the most historically active volcanoes in the Aleutians East Borough Planning Area, with the most recent eruptions occurring in 1999, 2004, 2014, and 2023. During the 2023 eruption, trace ash fall was reported in King Cove, False Pass, Cold Bay, and Sand Point. The eruption resulted in the Cold Bay airport being closed between September 25-29 due to ash on the runway (AVO 2023).

**Mount Pavlof** is considered the most active volcano in Alaska, and has had recent eruptions in 2007, 2013, 2014, 2016, and 2021. During the 2016 eruption, minor ashfall was reported at Nelson Lagoon, and the ash plume from the eruption caused flight delays and cancellations throughout Alaska.

**Mount Westdahl** most recently erupted in 1991, with steam and ash plumes being reported by pilots flying over the Aleutian Islands, as well as light ashfall in False Pass.

**Mount Akutan** is historically one of the most active volcanoes in Alaska, with 25 eruptions occurring since 1900 (AVO 2026). While most eruptions haven't resulted in severe impacts to communities in the Aleutians East Borough Planning Area, geologic evidence indicates that Akutan is capable of producing significantly larger ashfall and impacts during future eruptions.

### 3.2.11.4 Extent (Magnitude and Severity)

After a volcanic eruption, post-eruption hazards may pose a threat to surrounding and distant communities. Below are a sample of post-eruption hazards that may occur and the extent (magnitude and severity) of each.

| Eruption Hazard | Extent of the Hazard |
|---|---|
| Lahars | Lahars are usually created by eruptions of stratovolcanoes, like Pavlof, Shishaldin, Akutan, and Westdahl. Lahar is a hot or cold mixture of rock fragments that flows down the slopes of a volcano, typically into a river valley. They can act as a mudflow or a debris flow. Lahars may occur with or without a volcanic eruption- when high-volume or long-duration rainfall occurs. Lahars pick up materials as they travel and can grow up to 10 times their original size. |
| Landslides | Landslides are common during eruptions of stratovolcanoes because their massive cones typically rise thousands of feet above the surrounding terrain. If the moving rock debris is large enough and contains a large content of water and soil material, the landslide may transform into a lahar and flow down valley more than 50 miles from the volcano. |
| Lava Flows | Lava flows are streams of molten rock that pour or ooze from an erupting vent. They occur during many eruptions of volcanoes in the Aleutians East Borough Planning Area, particularly Pavlof and Akutan. Lava flows move slowly enough that people can typically outrun them, but they are extremely dangerous and will destroy everything in its path. |
| Pyroclastic Flows | Pyroclastic flows are the deadliest of the volcanic hazards. Pyroclastic flows are made up of a mixture of rock fragments, gases, and ash that travel quickly away from the volcanic vent. These pyroclastic flows are typically greater than 1,500 ºF and can travel at speeds up to 50 mph. Pyroclastic flows can be extremely destructive and deadly because of their high temperature and rate of speed that they travel. |
| Volcanic Gases | Volcanic gases are made up of water vapor (steam), carbon dioxide, ammonia, as well as sulfur, chlorine, fluorine, boron compounds, and several other compounds. Wind is the primary source of dispersion for volcanic gases. Life, health, and |

| Eruption Hazard | Extent of the Hazard |
|---|---|
| | property can be endangered from volcanic gases within about 6 miles of a volcano. Acids, ammonia, and other compounds present in volcanic gases can damage eyes and respiratory systems of people and animals, and heavier-than-air gases, such as carbon dioxide, can accumulate in closed depressions and suffocate people or animals. |
| Volcanic Ash | Volcanic ashfall is the most common and widespread volcanic hazard affecting the Aleutians East Borough Planning Area. Volcanic ash is a mixture of rock, mineral, and glass particles that are expelled from a volcano during an eruption. These particles are very small and are low density, which allows them to travel long distances, typically by wind. These small particles can have jagged edges, which pose a hazard when breathed in or land on the skin. Ashfall can travel thousands of miles from the eruption site.<br>While in the air, ash can cause problems for jet engines, forcing airlines to cancel flights. An ashfall that leaves a thick layer of ash may collect on homes, causing roof collapse, clogged gutters, or damage to other machinery. Animals may also be affected by volcanic ash by having difficulty finding food, or water and food sources are contaminated. |

Due to the Aleutian East Borough's proximity to volcanic activity and statewide volcanic ash areas, impacts would consist of health and visibility issues stemming from ashfall, as well as significant air travel disruptions. While secondary hazards such as lahars, volcano-induced landslides, lava flows, pyroclastic flows, or volcanic gases aren't likely to impact the Aleutians East Borough Planning Area on a widespread level, communities located near active volcanoes such as Akutan and False Pass may be vulnerable to these localized hazards.

Based on previous occurrences and the criteria identified in Table 4, the magnitude and severity to the Aleutians East Borough Planning Area from a volcanic eruption are considered **Limited**, with injuries and/or illnesses that do not result in permanent disability; complete shutdown of critical facilities for more than one week; and more than 10% of critical facilities being severely damaged.

#### 3.2.11.5 Impact

Eruption types and wind conditions are a major determinant of the physical impacts a volcanic event will create, and the hazards it poses to a community. Due to its ability to travel long distances from the source of an eruption, volcanic ashfall (and impacts to air travel) is the hazard that could most likely impact the Aleutians East Borough Planning Area. Other hazards such as lahars, pyroclastic flows and clouds, and lava flows are unlikely to impact the entire Planning Area, but specific communities near active volcanoes may be impacted by these hazards on a local level.

Ashfall is a general event that may affect all residents of the Aleutians East Borough Planning Area. The elderly, the chronically ill, and the very young would experience the most severe respiratory distress from inhalation of volcanic ash. Poor visibility would endanger anyone having to travel, walk, or operate equipment during an ashfall event. It can also cause slippery roadway conditions, if wet, and may cause power outages.

Several relatively recent volcanic eruptions have resulted in ash fall throughout the Aleutians East Borough Planning Area, disrupting air traffic and in some cases, negatively affecting living conditions and causing significant environmental damage, even in areas hundreds of miles from the eruption.

***The Alaska Volcano Observatory lists the following far-field hazards that are relevant to the Aleutians East Borough Planning Area:***

- Volcanic Ash Clouds
- Volcanic Ash Fallout

Near-field hazards, including lahars and floods, volcanic gases, pyroclastic flows and surges, ballistics, lava flows and lava domes, rockfalls and landslides, debris avalanches, and directed blasts, are not anticipated to impact the Aleutians East Borough Planning Area on a widespread level. However, many communities within the Aleutians East Borough Planning Area may be affected by localized eruptions.

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding the Aleutians East Borough Planning Area has been ashfall. While the majority of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposit (USGS 2015). |
| Infrastructure | The historical ashfall reported in the Aleutians East Borough Planning Area has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of the Aleutians East Borough Planning Area from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. |
| Utilities | While the majority of historical volcanic eruptions impacting the Aleutians East Borough Planning Area has not resulted in significant utility disruptions, reports from the 1962 Mount Akutan eruption indicated that the eruption caused volcanic ash to infiltrate the water system in Akutan. |
| Transportation | The primary transportation related impact from a volcanic eruption in the Aleutians East Borough Planning Area is aircraft interruptions. Ash clouds from Mount Pavlof's 2016 eruption caused flight delays and cancellations throughout the Aleutians East Borough Planning Area. |
| Economy | The primary economic related impact from a volcanic eruption in the Aleutians East Borough Planning Area is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations. |
| Subsistence Resources | Local and Tribal observations indicate that volcanic ashfall can affect subsistence systems by limiting access to harvesting areas, reducing opportunities for safe harvesting, and contaminating harvested foods, water, and equipment. |

#### 3.2.11.6 Probability of Future Events

The 2023 State of Alaska Hazard Mitigation Plan states the following regarding predicting volcanic eruptions:

> *"Geologists can make general long-term forecasts associated with individual volcano activities by carefully analyzing past activity, but these are based on trends and likelihood, rather than specific events or timelines. Short-range forecasts are often possible with greater accuracy.*
>
> *Signs of increasing activity can indicate that an eruption will follow within weeks or months. Magma moving upward into a volcano often causes a significant increase in small, localized earthquakes, and measurable carbon dioxide and compounds of sulfur and chlorine emissions increases. Shifts in magma depth and location can cause ground level elevation changes that can be detected through ground instrumentation or remote sensing observations."*

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact the Aleutians East Borough Planning Area.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 5, it is **Highly Likely** the Aleutians East Borough Planning Area will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### 3.2.11.7 Future Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in the Aleutians East Borough Planning Area. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in the Aleutians East Borough Planning Area. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in the Aleutians East Borough Planning Area. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in the Aleutians East Borough Planning Area. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in the Aleutians East Borough Planning Area. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in the Aleutians East Borough Planning Area. |
| Land Use Development | Future climate conditions are not expected to influence land use development in the Aleutians East Borough Planning Area. |
| Subsistence Resources | Future climate conditions are not expected to influence the Aleutians East Borough Planning Area's ability to access subsistence resources. |

## 3.2.12 Wildland Fire

### 3.2.12.1 Nature

Wildfires are a natural part of boreal forest and tundra ecosystems in Alaska. Wildland fire in Alaska is most common in the northern boreal forests of the Interior.

Fires can be divided into the following categories:

- **Prescribed fires**: ignited under predetermined conditions to meet specific objectives, to mitigate risks to people and their communities, and/or to restore and maintain healthy, diverse ecological systems.
- **Wildland Fire**: any non-structure fire, other than prescribed fire, that occurs in the wildland.
- **Wildland Fire Use**: a wildland fire functioning in its natural ecological role and fulfilling land management objectives.
- **Wildland-Urban Interface Fires**: fires that burn within the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. The potential exists in areas of wildland-urban interface for extremely dangerous and complex fire burning conditions which pose a tremendous threat to public and firefighter safety.

Wildland fires are types of fires which spread via the consumption of vegetation, and they often spread very quickly due to the amount of vegetation available. They begin sometimes unnoticed and cause dense smoke that is usually visible from several to tens of miles. Two principal causes are natural (e.g., lightning) and human activity (campfires, cigarettes, unattended burns). They more usually happen in forests or other areas with sufficient vegetation (e.g., prairies). Wildland fires are usually classified as to a specific type or locale such as: urban, tundra, interface or intermix fires, as well as prescribed fires.

There are four significant variables which contribute to the behavior and extent of wildland fires, and these can be used to identify potential areas that are more susceptible to wildland fires. These are:

- **Topography**: the amount and aspect of slopes influence how wildland fires spread and how quickly. Slopes that face south are subject to more solar radiation which makes them generally drier and more prone for wildfires. Sometimes ridge lines or ridge tops become a natural barrier to wildfires as fires spread more slowly downhill.
- **Fuel**: Wildland fires are heavily dependent on the type and extent of fuel, i.e., vegetation, present for their spread and occurrence. Certain species of plants are much more ignitable and will burn with greater intensity. The amount of combustible material available is referred to as the fuel load, and the denser the vegetation the more intense the wildland fire can become. The amount of dead matter, e.g., leaf litter, compared to living matter also considerably effects the nature of these fires. Periods of prolonged droughts cause a decrease in the moisture of both living and dead matter and significantly increase the odds of wildland fire occurrence and extent. Future climate conditions are now a factor as well. Lastly, the continuity of the fuel load is a main factor in both horizontal and vertical planes. The more continuous the fuel, the easier a fire will spread.
- **Weather**: Of all the factors which affect wildfires, weather is the most variable. The ignition and spread of a wildfire are dependent on humidity, temperature, winds, and lightning. Extreme bouts of weather, such as heat waves, high winds, or droughts, can lead to extensive wildfire activity. Dry seasons are generally becoming longer due to future climate conditions, and this has led to an increase in wildfires. Conversely, periods of increased rain and cooling decrease the odds of wildland fires and ease their containment. Lightning strike wildfires are less prevalent in coastal regions than in the Interior of Alaska because the climate is much wetter (Alaska SHMP 2023).
- **Season**: The seasons with more vulnerability for wildfires are late summer and early autumn. This is generally the time when the fuel (vegetation) dries out. The moisture content drops sharply and the ratio to dead to living material increases. Though there are many factors which contribute to the extent and intensity of wildfires such as: wind speed and direction, fuel load and type, humidity, and topography, the most common causes of wildfires in Alaska, historically, have been lightning or human negligence.

Other hazards do influence the extent and frequency of wildland fires. These are, for example: infestations, lightning, and drought. If a wildland fire is not quickly and properly controlled, it can grow rapidly into a disaster or emergency. The smallest of wildfires can even threaten lives, resources, and destroy properties. Livestock and pets are also susceptible to wildfires. Some wildfires can precipitate the need for emergency food and water, evacuation, and temporary shelters.

Sometimes the effects of wildland fires can be catastrophic. They can destroy large areas of forest and other vegetation, damage the soil, waterways, and the land itself. Some soils may lose their capacity to keep moisture and support life for years after an intense wildfire.

Fires in the wildland-urban interface are of particular concern because they are difficult to control. A structure fire can quickly ignite surrounding vegetation resulting in the spread of fire to nearby structures and vegetation. Without the application of aggressive fire suppression and protection of exposures, fires do not confine themselves to one building and can easily spread to other buildings. Alternatively, wildland fires that burn within the line, area, or zone where structures and other human development meet, can ignite nearby development (wildland fire urban interface).

**Table 19- Types of Building Construction**

| Construction Type | Description |
|---|---|
| **Type I** (fire resistive) - Least combustible | Fire-resistive construction was originally designed to contain fire inside the building to one floor. This concrete and steel structure, called “fire resistive” when first built at the turn of the century, was intended to confine a fire with its construction. Faults in modern construction allow fire to spread over several floors in a fire-resistive building despite its steel-and-concrete structure by spreading through air-conditioning and heating ducts as well as from lower windows to windows above in a multi-story building. |
| **Type II** (non-combustible) | Non-combustible buildings have steel or concrete walls, floors, and structural framework. When a fire occurs inside a type II building, flames rising to the underside of the steel roof deck may conduct heat through the metal and ignite the combustible roof. |
| **Type III** (ordinary) | Ordinary construction is also called brick-and-joist construction. It has masonry bearing walls, but the floors, structural framework and roof are made of wood or other combustible material. Ordinary construction has been described by some firefighters as a "lumberyard enclosed by four brick walls." |
| **Type IV** (heavy timber) | Heavy-timber construction is sometimes called "mill construction" because it was the type of structure used at the turn of the century to house textile mills. These buildings have masonry walls like type III buildings, but the interior wood consists of large timbers that can create large, radiated heat waves after the windows break during a blaze. A fire in a heavy-timber building can produce a tremendous conflagration with flames coming out of the windows, spreading fire to adjoining buildings. |
| **Type V** (wood frame) - Most combustible | Wood-frame construction is the most combustible of the five building types. The interior framing and exterior walls may be wood. A wood-frame building is the only one of the five types of construction that has combustible exterior walls. |

Source: Vincent Dunn, Deputy Chief FDNY (retired)- Structural Fire Spread

#### 3.2.12.2 Location

Figure 45 depicts wildfire exposure risk in the Aleutians East Borough. The Aleutians East Borough Planning Area is located in an area with **Very Low Wildfire Exposure Risk**.

**According to the EPA, the Aleutians East Borough Planning Area consists of three Level 3 Ecoregions.** Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. These general purpose regions are critical for structuring and implementing ecosystem management strategies across federal agencies, state agencies, and nongovernment organizations that are responsible for different types of resources within the same geographical areas (EPA 2026).

**Nelson Lagoon and Cold Bay are located in Region 112: Bristol Bay- Nushagak Lowlands.** This lowland ecoregion is located in southwestern Alaska off Bristol Bay. The region has rolling terrain, formed from morainal deposits. Soils of the lowlands are somewhat better drained than soils of the Subarctic Coastal Plains Ecoregion (109). Dwarf scrub communities are widespread, but large areas of wetland communities occur. Lakes are scattered throughout the lowlands but are not nearly as numerous as in the Subarctic Coastal Plains (EPA 2026).

**Sand Point, Unga Village, Belkofski Village, King Cove, Pauloff Harbor Village, and False Pass are location in Region 113: Alaska Peninsula Mountains.** This ecoregion is composed of rounded, folded and faulted sedimentary ridges intermittently surmounted by volcanoes. The mountains were heavily glaciated during the Pleistocene epoch. A marine climate prevails, and the region is generally free of permafrost. Many soils formed in deposits of volcanic ash and cinder over glacial deposits and are highly erodible. Vegetation cover commonly consists of dwarf scrub communities at higher elevations and on sites exposed to wind, and low scrub communities at lower elevations and in more protected sites (EPA 2026).

**Akutan is located in Region 114 (Aleutian Islands).** This ecoregion in southwestern Alaska is composed of a chain of sedimentary islands (eroded from older volcanic formations) that are crowned by steep volcanoes. Maritime climate prevails. The region is south of the winter sea ice pack and is generally free from permafrost. Vegetation cover mainly consists of dwarf scrub communities at higher elevations and on sites exposed to wind, and of graminoid herbaceous communities in more protected sites (EPA 2026).

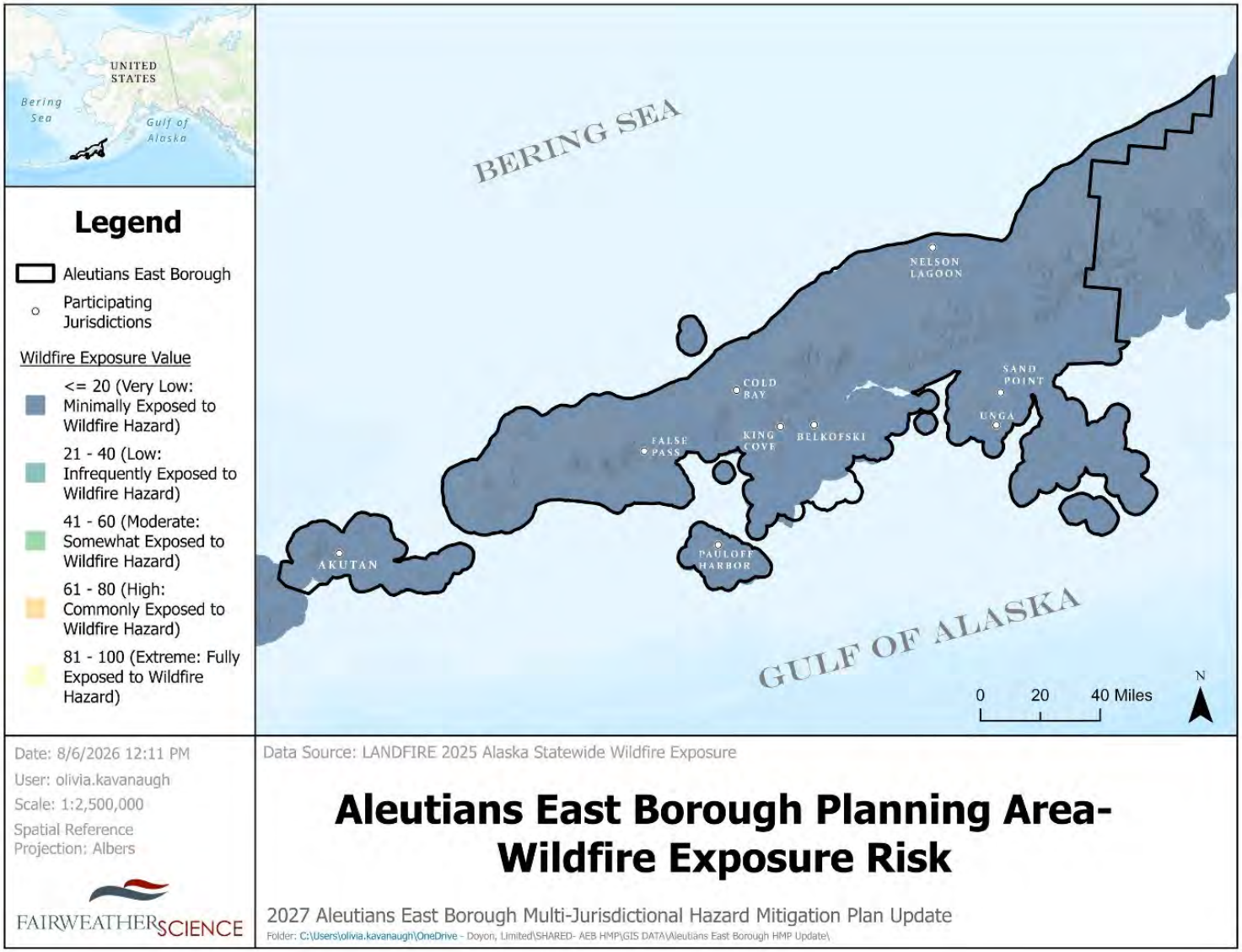



**Figure 45- AEB Wildfire Exposure Risk**

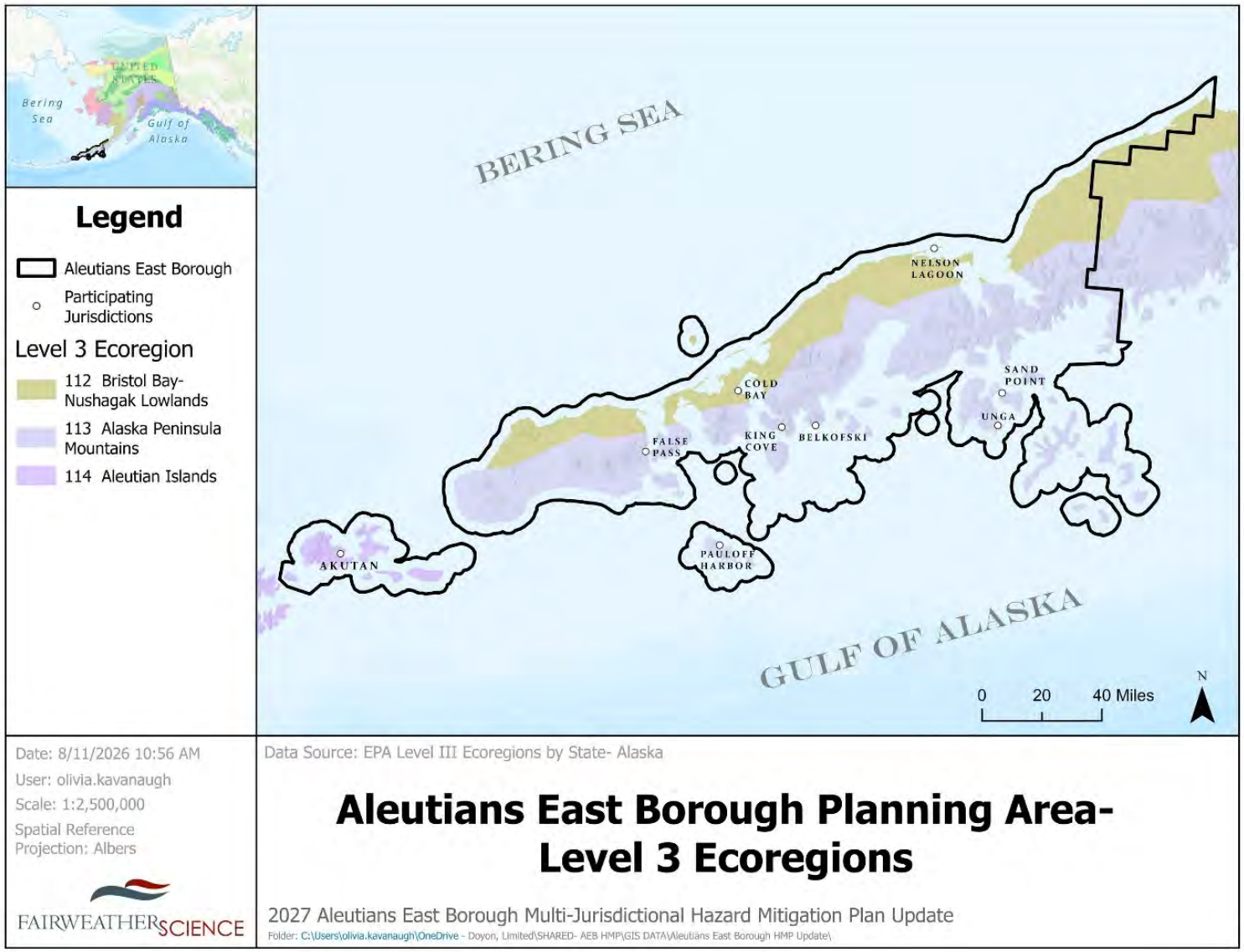



**Figure 46- AEB Level 3 Ecoregions**

### 3.2.12.3 History

The Alaska Division of Forestry and Fire Protection and the Alaska Fire Service identified human-caused "High Profile Fires" in the 2023 State Hazard Mitigation Plan. None of these fires were located in or around the Aleutians East Borough Planning Area (Alaska DHS&EM 2023).

***There have been no State or Federal disaster declarations within the Aleutians East Borough related to wildfire.***

Table 20 lists historical fires in the Aleutians East Borough Planning Area from 1939 to December 2025. None of these fires had a confirmed natural cause due to lightning and were all human-caused or of unknown origin (AICC 2026). This information is also displayed in Figure 47.

**Table 20- Historical Wildfires, Planning Area Region 1939 - December 2025**

| Discovery Date | Name | Prescribed Fire? | Latitude | Longitude | Estimated Total Acres | Cause |
|---|---|---|---|---|---|---|
| 1965-04-18 | Unga Island | No | 55.33333 | -160.55 | 320 | Human- Recreation |
| 1965-08-04 | Rotary Beach 2 | No | 55.31667 | -161.55 | 0.1 | Human- Smoking |
| 1968-06-15 | Seal Cape | No | 55.4 | -161.333 | 5 | Human- Debris Burning |
| 1981-06-08 | Nagai Isle | No | 55.08333 | -160 | 3 | Unknown |
| 1982-04-20 | Unimak | No | 54.63333 | -163.65 | 500 | Human |
| 1992-05-15 | Canoe Bay | No | 55.53333 | -161.283 | 30 | Other |
| 1996-05-18 | Popof | No | 55.31667 | -160.5 | 30 | Cooking Fire |
| 2010-05-25 | Sand Point | No | 55.33389 | -160.491 | 3.5 | Human |
| 2010-05-26 | Beaver Bay | No | 55.51972 | -160.819 | 3 | Human- Campfire |
| 2018-02-20 | Akutan | No | 54.13308 | -165.789 | 17.9 | Debris Burning- Open Trash Burn |
| 2018-02-26 | Trident | No | 54.13303 | -165.788 | 0.5 | Debris Burning- Open Trash Burn |
| 2019-07-04 | Unga Island | No | 55.2693 | -160.675 | 0.1 | Investigated but cause Undetermined |
| 2022-05-12 | Danger Point | No | 55.34275 | -160.435 | 70.4 | Human- Debris Burning |

Source: AICC 2026

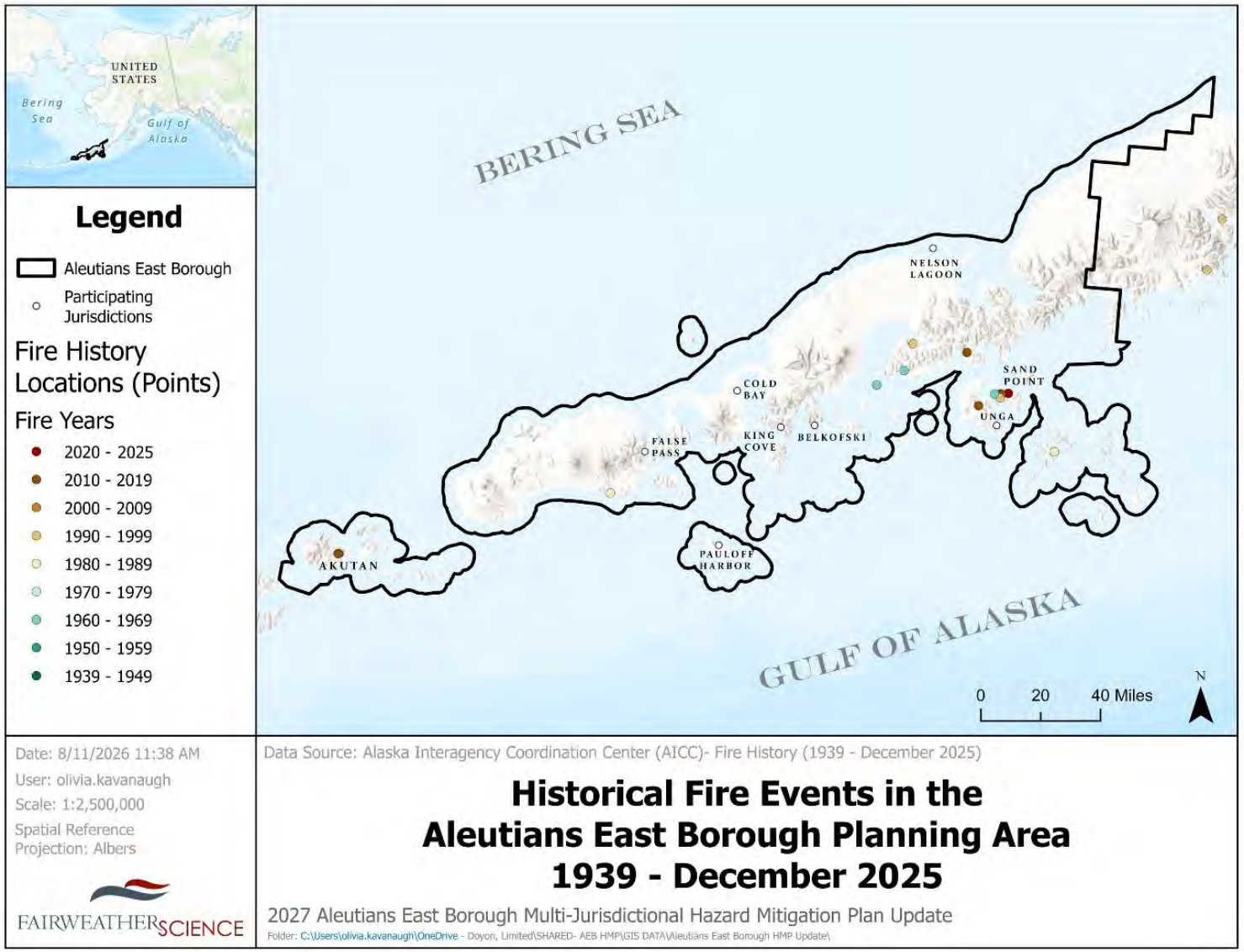



**Figure 47- Historical Fire Events in the Aleutians East Borough Planning Area (1939 - December 2025)**

#### 3.2.12.4 Extent (Magnitude and Severity)

Historically, most large wildland fires occur in the central interior of Alaska. When weather and fuel conditions align, fires can happen in less likely areas such as the Aleutian Peninsula. The historic extent of wildland fires in the Aleutians East Borough Planning Area range from less than an acre to 500 acres.

Due to the few recorded historical wildland fire events as well as the criteria listed in Table 4, the magnitude and severity of wildland fire events in the Aleutians East Borough Planning Area is **Limited** with minor injuries, the potential for critical facilities to be shut down for more than one week, more than 10% of property or critical infrastructure being severely damaged, and little to no permanent damage to transportation or infrastructure or the economy.

#### 3.2.12.5 Impact

For many ecosystems, wildfires are critical features of the natural history. They can serve to help maintain renewal, biodiversity, and the ecological health of the land in general.

Wildfires can also be incredibly destructive. The effects of wildland fires can become catastrophic. They can destroy large areas of forest and other vegetation, damaging the soil, waterways, and the land itself. Some soils may lose their capacity to retain moisture and support life for years after an intense wildfire. Exposure of the land after a wildland fire may lead to increased land destabilization, landslides, and add to the siltation of rivers and streams. This can increase the chances of flooding, degrade water quality, undermine structural stability of homes and infrastructure, and significantly harm aquatic life.

Even relatively small wildfires can threaten lives, damage property, and disrupt essential resources. Livestock and pets are also vulnerable to smoke, heat, and rapid-fire movement. Wildfire impacts may create urgent needs for food, water, evacuation, and temporary shelter. Fires can strain water systems by depleting storage tanks or preventing distribution systems from maintaining adequate pressure, and systems often require careful re-pressurization after the event. Large wildfires can significantly degrade air quality, and smoke can travel long distances, affecting the health of people and animals far from the fire site.

Wildland fires can cause air transportation impacts including damage to structures that support air travel and fire fighting equipment and personnel. Smoke from wildland and urban fires can disrupt air transportation and in extreme scenarios, fire can damage runway areas making them not suitable for aircraft arrivals and departures.

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | All historical wildfire events in the Aleutians East Borough have been caused due to human negligence. Most of these fires resulted in little acreage burned (less than 5 acres).<br>The largest fire occurred in 1982 and resulted in 500 acres burned on Unimak Island (southwest of False Pass, outside of City boundaries) (AICC 2026).<br>The second largest fire occurred in 1965 and resulted in 320 acres burned on Unga Island (northeast of Unga Village, outside of the Historical Village boundaries) (AICC 2026). |
| Infrastructure | Infrastructure in the Aleutians East Borough has not been impacted by wildfires. |
| People | No injuries or fatalities have been reported due to wildfires in the Aleutians East Borough. |
| Utilities | Utility systems in the Aleutians East Borough have not been impacted by wildfires. |
| Transportation | Transportation in the Aleutians East Borough has not been impacted by wildfires. |

| | Description of Previous/Potential Impacts |
|---|---|
| Economy | The economy of the Aleutians East Borough has not been impacted by wildfires. |
| Subsistence Resources | Subsistence resources in the Aleutians East Borough have not been significantly impacted by wildfires.<br>Wildfires have the potential to impact subsistence areas as well as important subsistence resources, such as berries and berry bushes. |

#### 3.2.12.6 Probability of Future Events

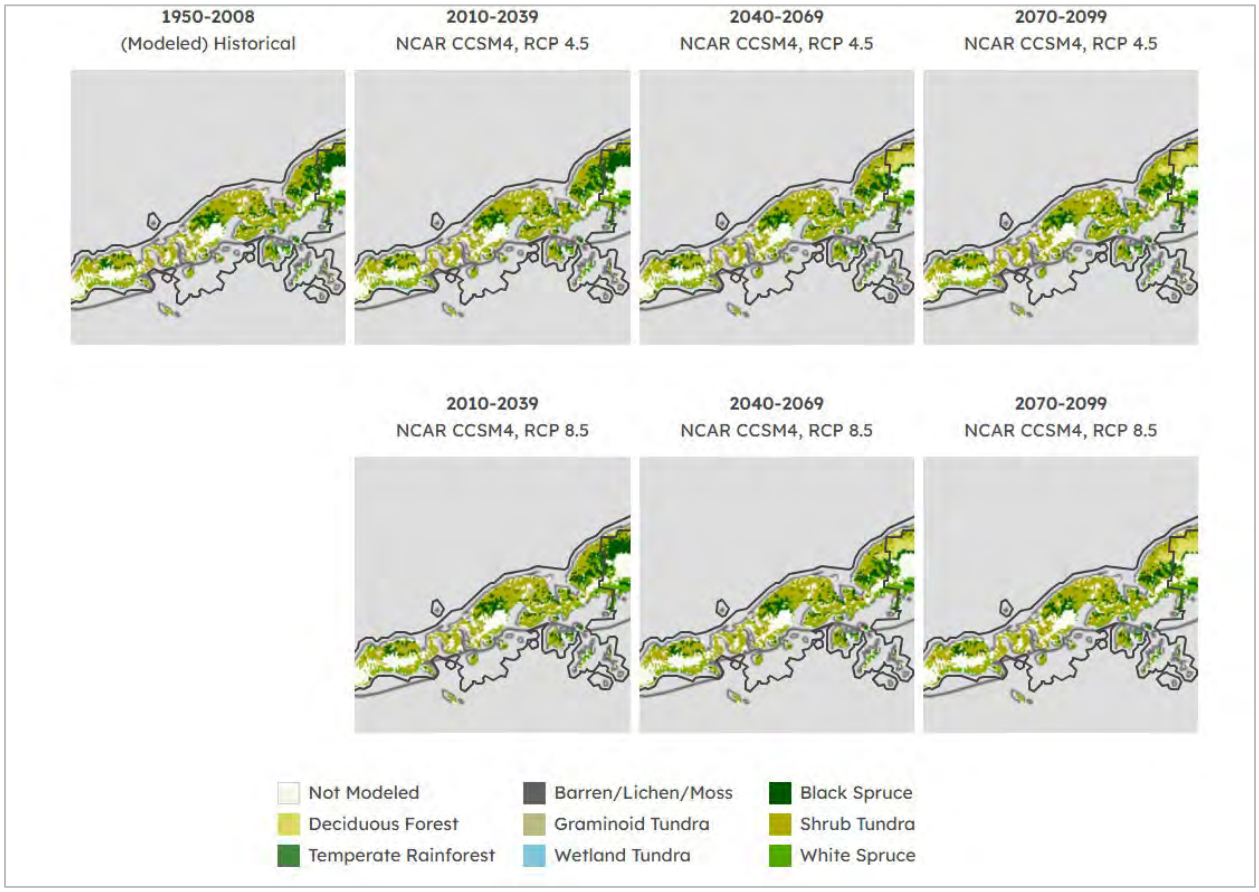
Based on previous occurrences and the criteria identified in Table 5, it is **Possible** that the Aleutians East Borough Planning Area will experience a wildland fire event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### 3.2.12.7 Future Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of wildland fires in the Aleutians East Borough Planning Area is not anticipated to change in respect to future climate conditions. |
| Location | The location of wildland fires in the Aleutians East Borough Planning Area is anticipated to change slightly in respect to future climate conditions, as some areas see a higher likelihood of burning than in the past. Most of these areas are far from communities and infrastructure, except for Sand Point (UAF IARC 2026). |
| Extent (Magnitude and Severity) | Due to future climate conditions, the extent (magnitude and severity) of wildland fires is expected to increase in Alaska in general. Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050 (EPA 2022). In the Aleutians East Borough Planning Area, more acreage is trending from “less likely to burn” to “more likely to burn” (UAF IARC 2026). |
| Impact | Due to future climate conditions, the impact of wildland fires on the Aleutians East Borough Planning Area may increase. More frequent fires due to a change in future conditions may increase the risk of health hazards and low visibility posed by the increase of smoke (AFSC 2025). |
| Probability of Future Events | Future climate conditions within Alaska are likely to result in increased drought and longer fire seasons. Shifts in vegetation will influence the intensity and frequency of fires (IPCC 2019). A warming climate is also projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018).<br>Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050, however this is most applicable to Alaska’s most fire-prone regions in the interior (EPA 2022). |
| Population Patterns | Wildland fires due to future climate conditions are not anticipated to impact population patterns in the Aleutians East Borough Planning Area. |
| Land Use Development | Wildland fires due to future climate conditions may influence the location of future development in areas with higher fire risk, although in most areas with year-round populations and infrastructure, the wildfire risk is expected to remain low. |

| Description of Future Conditions | |
|---|---|
| Subsistence Resources | A warming climate is projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018). |

Vegetation Type: In the Aleutians East Borough, the predominant vegetation types are currently Shrub Tundra, Black Spruce, White Spruce, Graminoid Tundra, and Deciduous Forest (UAF/SNAP 2026). Figure 48 shows the projected changes in the location of vegetation in the Aleutians East Borough from 1950 through year 2099.

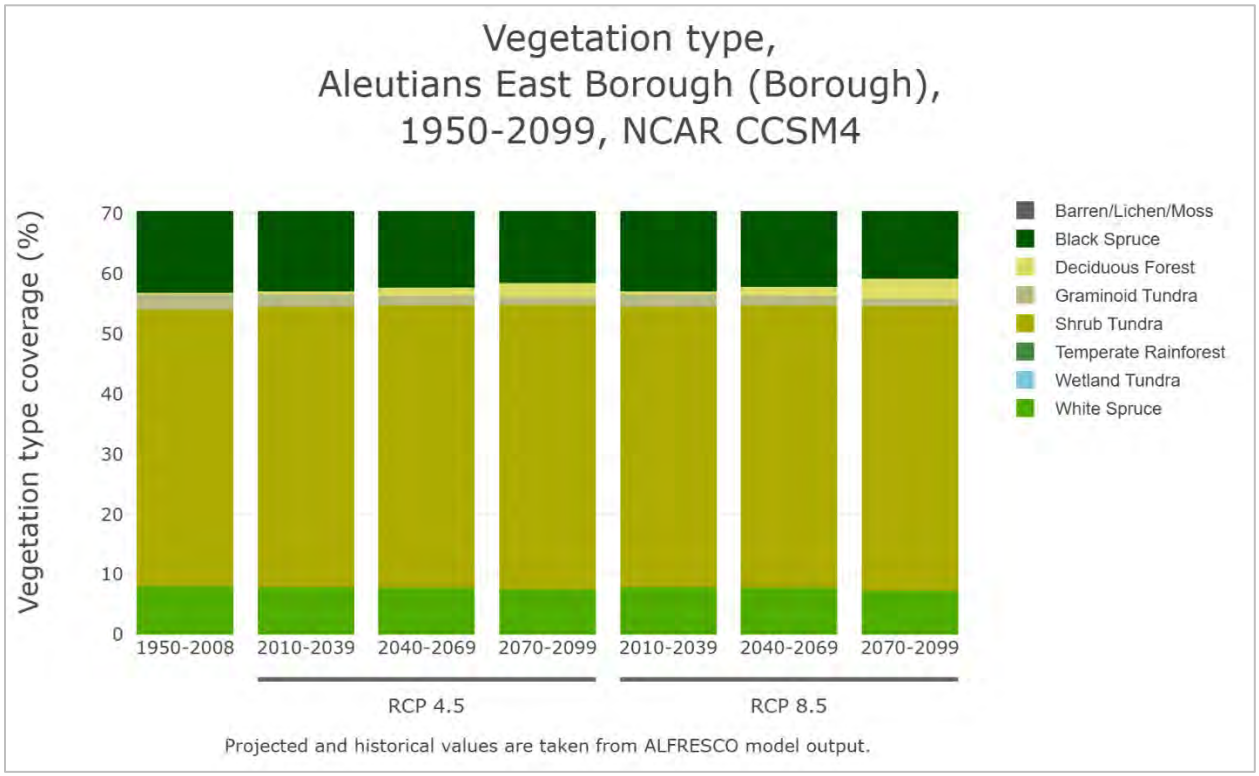



Source: UAF/SNAP 2026- Northern Climate Reports

**Figure 48- Planning Area Vegetation Type Map (1950 - 2099)**

Figure 49 shows historical and projected changes in vegetation type coverage in the Aleutians East Borough from 1950 through year 2099.

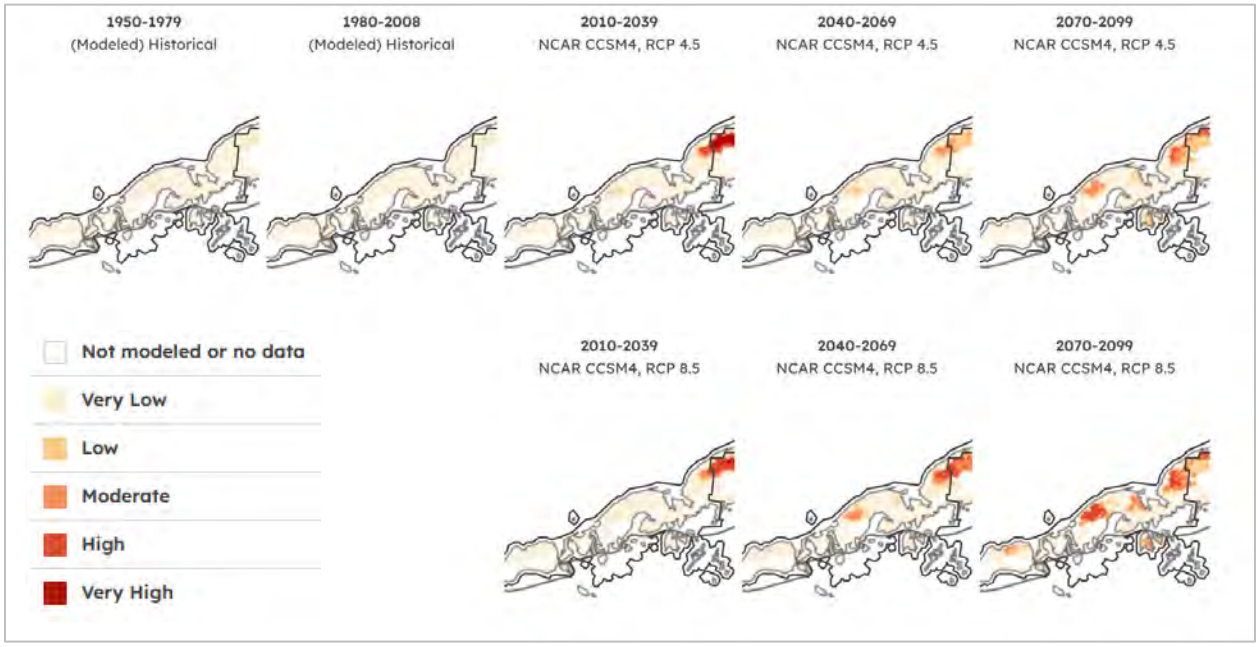
These models predict that the vegetation type in the region will stay relatively consistent through the end of the century, with a slight increase in the presence of Deciduous Forest type and decrease in Graminoid Tundra type.




Source: UAF/SNAP 2026- Northern Climate Reports

**Figure 49- Planning Area Vegetation Type Graph (1950 - 2099)**

Flammability: Historically, the Aleutians East Borough Planning Area has had Very Low flammability (UAF/SNAP 2026). Under the NCAR CCSM4 climate model, areas within the Borough are expected to have increased flammability conditions by 2039 with continued increase through the end of the century (Figure 50).




Source: UAF/SNAP 2026- Northern Climate Reports

**Figure 50- Planning Area Historical and Projected Flammability (1950 - 2099)**

## 3.3 Vulnerability Assessment

This section outlines the risk and vulnerability processes from various hazard impacts in determining potential losses for the jurisdictions.

This section addresses the remaining portion of Element B of the Local and Tribal Mitigation Plans regulation checklists.

| Regulation Checklist- 44 CFR § 201.6 Local Mitigation Plans |
|---|
| **ELEMENT B. Risk Assessment** |
| B2. Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods? (Requirement 44 CFR § 201.6(c)(2)(ii))<br>B2-a. Does the plan provide an overall summary of each jurisdiction's vulnerability to the identified hazards?<br>B2-b. For each participating jurisdiction, does the plan describe the potential impacts of each of the identified hazards on each participating jurisdiction?<br>B2-c. Does the plan address NFIP-insured structures within each jurisdiction that have been repetitively damaged by floods? |
| Source: FEMA 2025 (Local) |

| Regulation Checklist- 44 CFR § 201.7 Tribal Mitigation Plans |
|---|
| **ELEMENT B. Hazard Identification and Risk Assessment** |
| B3. Does the plan include an overall summary of the vulnerability of the tribal planning area? [44 CFR § 201.7(c)(2)(ii)] |
| Source: FEMA 2017 (Tribal) |

### 3.3.1 Vulnerability Overview

A vulnerability analysis estimates the exposure extent that may result from a hazard event, within a given area and with a given intensity. This analysis provides quantitative data that may be used to identify and prioritize potential mitigation measures. This then allows the jurisdictions to focus their efforts and attention on areas with the greatest risk of damage.

Table 21 provides an overview of the total infrastructure hazard vulnerability in the Aleutians East Borough. These values are a sum of all 14 participating jurisdictions' vulnerability analysis.

See **Volume 2. Jurisdictional Annexes** for each jurisdiction's individual summary of vulnerability.

**Table 21- Summary of Critical Infrastructure Vulnerability (All Jurisdictions)**

| Hazard | # of Facilities | # of Occupants | $ of Facilities |
|---|---|---|---|
| **Cryosphere- Sea Ice** | 7 | 0 | $120,000,000 |
| **Cryosphere- Snow Avalanche** | 120 | 825 | $879,487,997 |
| **Earthquake** | 642 | 14,106 | $5,337,884,959 |
| **Sediment Deterioration and Land Destabilization** | 50 | 186 | $647,433,082 |
| **Flood** | 558 | 13,786 | $4,627,188,241 |
| **Ground Failure/Landslide** | 194 | 2,989 | $1,339,841,001 |
| **Severe Weather** | 642 | 14,106 | $5,337,884,959 |

| Hazard | # of Facilities | # of Occupants | $ of Facilities |
|---|---|---|---|
| Tsunami | 364 | 3,792 | $3,059,479,502 |
| Volcano | 642 | 14,106 | $5,337,884,959 |
| Wildland Fire | 298 | 4,224 | $2,109,284,149 |
| Dam Failure | 90 | 585 | $480,463,845 |
| Invasive Species | 0 | 0 | $0 |

### 3.3.2 Cultural and Sacred Site Sensitivity

The jurisdictional Planning Teams have reviewed the hazard areas and where cultural and sacred sites, including subsistence areas and infrastructure, fall within those areas.

This information is considered sensitive and confidential and not included in the Final HMP document. Questions regarding this information should be addressed to the jurisdictional Planning Teams.

### 3.3.3 Population and Housing Stock

The number of residential houses in each community was determined through a comprehensive analysis of satellite imagery, with confirmation by each jurisdiction.

| Location | Number of Houses | Number of Trailer Homes |
|---|---|---|
| Akutan | 38 | - |
| Cold Bay | 53 | - |
| False Pass | 34 | - |
| King Cove | 178 | - |
| Nelson Lagoon | 41 | - |
| Sand Point | 219 | 18 |

The estimated replacement cost of residential housing was determined by using a 2022 HUD dataset (*Total Development Cost (TDC) for Affordable Housing Under the Native American Housing Assistance and Self-Determination Act of 1996 (NAHASDA)*) replacement values for a 3-bedroom house. Trailer homes were assessed using the replacement value for a 2-bedroom house.

| Location | Replacement Value | |
|---|---|---|
| | 2-Bedroom House | 3-Bedroom House |
| Akutan, False Pass, King Cove, Sand Point, Nelson Lagoon | $642,360 | $724,888 |
| Replacement values were not listed for Belkofski Village, Cold Bay, Pauloff Harbor, or Unga. Replacement values for homes in these locations were analyzed with the values listed above. | | |

The population of each jurisdiction was determined by the State of Alaska Division of Community and Regional Affairs (DCRA) Community Database.

For the purposes of this Risk Assessment, the number of people potentially at risk due to each hazard was determined by multiplying an average number of people per household (4.0) by the number of residences.

***average number of people per household x # of residences = # of people at risk***

Table 22 provides overview of the total housing stock hazard vulnerability in the Aleutians East Borough. These values are a sum the housing vulnerability analysis for housing in Akutan, Cold Bay, False Pass, King Cove, Nelson Lagoon, and Sand Point. There are no full-time occupied houses in Belkofski Village, Pauloff Harbor Village, or Unga Village.

See **Volume 2. Jurisdictional Annexes** for each individual jurisdiction's housing stock summary of vulnerability.

**Table 22- Summary of Housing Stock Vulnerability (All Geographies)**

| Hazard | # of Houses | # of Occupants | $ of Houses |
|---|---|---|---|
| Cryosphere- Sea Ice | 5 | 20 | $3,624,440 |
| Cryosphere- Snow Avalanche | 46 | 184 | $33,344,848 |
| Earthquake | 581 | 2,352 | $420,797,433 |
| Sediment Deterioration and Land Destabilization | 21 | 84 | $15,222,648 |
| Flood | 519 | 2,100 | $375,129,489 |
| Ground Failure/Landslide | 80 | 320 | $57,991,040 |
| Severe Weather | 581 | 2,352 | $420,797,433 |
| Tsunami | 218 | 872 | $157,530,416 |
| Volcano | 581 | 2,352 | $420,797,433 |
| Wildland Fire | 275 | 1,100 | $197,941,224 |
| Dam Failure | 13 | 52 | $9,423,544 |
| Invasive Species | 0 | 0 | $0 |

### 3.3.4 Critical Facilities Inventory

A critical facility is defined as a facility that provides essential products and services to the public. Critical facilities assist in preserving the quality of life for residents in the Aleutians East Borough Planning Area and fulfilling important public safety, emergency response, and disaster recovery functions.

See **Volume 2. Jurisdictional Annexes** for each jurisdiction's list of critical facilities.

### 3.3.5 Community Values, Systems, and Ways of Life at Risk

The quantitative vulnerability assessment presented in this section evaluates exposure of critical facilities, housing, population, and associated financial values to identified hazards. These measures provide an important basis for understanding potential physical and economic losses but do not represent the full range of values that may be vulnerable to hazard impacts. Indigenous Knowledge, local and Tribal observations, and other community-provided information identify additional vulnerabilities associated with subsistence and food systems, traditional access and travel routes, environmental and cultural resources, culturally significant places, and practices that support cultural continuity and community resilience. These considerations supplement the quantitative exposure analysis and are incorporated throughout the hazard profiles and jurisdictional annexes, as appropriate.

# 4. Mitigation Strategy

This section outlines the process for preparing a mitigation strategy. The mitigation strategy provides a framework for implementing the actions and activities needed to systematically reduce hazard impacts, minimize damage, preserve infrastructure, save lives, and strengthen the jurisdiction's ability to withstand and recover from future disasters.

This section addresses Element C of the Local and Tribal Mitigation Plans regulation checklists.

| Regulation Checklist- 44 CFR § 201.6 Local Mitigation Plans |
|---|
| **ELEMENT C. Mitigation Strategy** |
| C1. Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 44 CFR § 201.6(c)(3))<br>C1-a. Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?<br>C1-b. Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?<br>C2. Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement 44 CFR § 201.6(c)(3)(ii))<br>C2-a. Does the plan contain a narrative description or a table/list of their participation activities?<br>C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.6(c)(3)(i))<br>C3-a. Does the plan include goals to reduce the risk from the hazards identified in the plan?<br>C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement 44 CFR § 201.6(c)(3)(ii))<br>C4-a. Does the plan include an analysis of a comprehensive range of actions/projects that each jurisdiction considered to reduce the impacts of hazards identified in the risk assessment?<br>C4-b. Does the plan include one or more action(s) per jurisdiction for each of the hazards as identified within the plan's risk assessment?<br>C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction? (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))<br>C5-a. Does the plan describe the criteria used for prioritizing actions?<br>C5-b. Does the plan provide the position, office, department or agency responsible for implementing/administrating the identified mitigation actions, as well as potential funding sources and expected time frame? |
| Source: FEMA 2025 (Local) |

| Regulation Checklist- 44 CFR § 201.7 Tribal Mitigation Plans |
|---|
| **ELEMENT C. Mitigation Strategy** |
| C1. Does the plan include a discussion of the tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including an evaluation of tribal laws and regulations related to hazard mitigation as well as to development in hazard-prone areas? (Requirement 44 CFR § 201.7(c)(3) and 201.7(c)(3)(iv)))<br>C2. Does the plan include a discussion of tribal funding sources for hazard mitigation projects and identify current and potential sources of Federal, tribal, or private funding to implement mitigation activities (Requirement 44 CFR § 201.7(c) (3)(iv) and 201.7(c)(3)(v))<br>C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.7(c)(3)(i)) |

| Regulation Checklist- 44 CFR § 201.7 Tribal Mitigation Plans |
|---|
| **ELEMENT C. Mitigation Strategy** |
| C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement 44 CFR § 201.7(c)(3)(ii))<br>C5. Does the plan contain an action plan that describes how the actions identified will be prioritized, implemented, and administered by the tribal government? (Requirement 44 CFR § 201.7(c)(3)(iii))<br>C6. Does the plan describe a process by which the tribal government will incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate? (Requirement 44 CFR § 201.7(c)(4)(iii))<br>C7. Does the plan describe a system for reviewing progress on achieving goals as well as activities and projects identified in the mitigation strategy, including monitoring implementation of mitigation measures and project closeouts? (Requirement 44 CFR § 201.7(c)(4)(ii) and 201.7(c)(4)(v))) |
| Source: FEMA 2017 (Tribal) |

## 4.1 Evaluating and Prioritizing Mitigation Actions

A comprehensive list of potential mitigation actions was developed and presented to each jurisdiction for review and consideration. The list was developed using multiple sources to ensure that a broad range of mitigation opportunities was considered. Potential mitigation actions were identified from the following sources:

- Projects identified in the previous Hazard Mitigation Plan (HMP)
- Findings from the Risk Assessment
- Recommendations and suggestions from the Planning Team
- Suggestions submitted by the public through the mitigation project survey
- Projects identified in other applicable HMPs
- Industry-standard mitigation practices and projects

The resulting list provided the jurisdictions with a broad range of potential actions for consideration. Jurisdictions reviewed the proposed actions and identified those that best addressed their hazard risks, community needs, and mitigation priorities. The identified actions were then evaluated and prioritized using the process described in the following section.

To consider the feasibility and constraints of implementing each mitigation action, the Planning Team reviewed the simplified **Social, Technical, Administrative, Political, Legal, Economic,** and **Environmental** (STAPLEE) evaluation criteria, further described below.

The Planning Team also incorporated **Cultural** considerations into the evaluation process to account for cultural values, traditions, locations, and resources that may influence the feasibility, appropriateness, or potential impacts of a mitigation action. These criteria provided a consistent framework for evaluating proposed mitigation actions and supporting their prioritization based on local conditions, needs, and capabilities.

In developing and evaluating mitigation actions, participating jurisdictions considered the broader range of community values and vulnerabilities identified through the planning process, including, where applicable, subsistence and food systems, traditional access, environmental and cultural resources, culturally significant places, and practices that support community resilience and cultural continuity.

| | CRITERION | GUIDING QUESTIONS |
|---|---|---|
| S | **SOCIAL**<br>Considers the effect on the health, safety, and well-being of people and communities. | • How will the action impact public health and safety?<br>• How will the action impact vulnerable populations and underserved communities?<br>• How will the action impact community cohesion, livelihoods, and quality of life? |
| T | **TECHNICAL**<br>Considers the technical feasibility, reliability, effectiveness, and maintainability of the action. | • Is the technology or approach proven and reliable?<br>• Will the action reduce risk effectively?<br>• Can the action be implemented as designed?<br>• Can the action be maintained over its expected life? |
| A | **ADMINISTRATIVE**<br>Considers the capacity and ability of the implementing organization to undertake the action. | • Do we have the staff, time, and resources to implement this action?<br>• Do we have the necessary equipment and facilities?<br>• Do we have the experience and capabilities to manage this action?<br>• Do we have a clear plan for implementation? |
| P | **POLITICAL**<br>Considers the level of political support and alignment with community priorities and goals. | • Is there support from elected officials and leadership?<br>• Does the action align with community values, goals, and existing plans?<br>• Is the timing right for this action?<br>• Is there broad community support? |
| L | **LEGAL**<br>Considers applicable laws, regulations, codes, and potential liability. | • Does the action comply with all applicable laws, regulations, and codes?<br>• Are permits or approvals required?<br>• Could the action create any liability issues? |
| E | **ECONOMIC**<br>Considers the cost and benefits of the action over its life cycle. | • What are the total estimated costs of the action?<br>• What are the benefits compared to the costs (cost-effectiveness)?<br>• Are funding sources available or likely?<br>• Is the action financially sustainable? |
| E | **ENVIRONMENTAL**<br>Considers the potential impacts on the natural environment and sustainability. | • What are the potential environmental impacts?<br>• Will the action protect, restore, or enhance natural resources?<br>• Does the action support climate resilience and sustainability? |

| Additional Considerations | | | |
|---|---|---|---|
| C | | Cultural<br>Considers the potential impacts on cultural and sacred sites, including subsistence resources | • What are the potential impacts to cultural sites, resources, or traditional practices?<br>• Will the action protect, preserve, or enhance cultural resources, including subsistence activities or areas?<br>• Could the action affect access to, use of, or connection with culturally significant places or resources? |

The Planning Team defined their project rating categories with a high, medium, or low priority:

- **High priority** actions are associated with actions that the Planning Team deemed most important to the community and may address hazards of highest concern.
- **Medium priority** actions are associated with actions that the Planning Team deemed important to the community and may address hazards of moderate concern.
- **Low priority** actions are associated with actions that the Planning Team deemed of less importance to the community and may address hazards of least concern.

Prioritizing the mitigation actions within the MAP was completed to provide the jurisdictions with an implementation approach for completing the actions in the five-year lifecycle of this MJHMP.

# 5. Plan Maintenance

This section describes the formal Plan maintenance process to ensure that the MJHMP remains an active and applicable document. This section includes an explanation of how the Planning Team intends to organize their efforts to ensure that improvements and revisions to the MJHMP occur in an efficient, well-managed, and coordinated manner.

This section addresses Element D of the Local Mitigation Plans regulation checklist and the remaining portion of Element A of the Tribal Mitigation Plans regulation checklist.

| Regulation Checklist- 44 CFR § 201.6 Local Mitigation Plans |
|---|
| **ELEMENT D. Plan Maintenance** |
| D1. Is there discussion of how each community will continue public participation in the plan maintenance process? (Requirement 44 CFR § 201.6(c)(4)(iii))<br>D1-a. Does the plan describe how communities will continue to seek future public participation after the plan has been approved?<br>D2. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)? (Requirement 44 CFR § 201.6(c)(4)(i))<br>D2-a. Does the plan describe the process that will be followed to track the progress/status of the mitigation actions identified within the Mitigation Strategy, along with when this process will occur and who will be responsible for the process?<br>D2-b. Does the plan describe the process that will be followed to evaluate the plan for effectiveness? This process must identify the criteria that will be used to evaluate the information in the plan, along with when this process will occur and who will be responsible.<br>D2-c. Does the plan describe the process that will be followed to update the plan, along with when this process will occur and who will be responsible for the process?<br>D3. Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement 44 CFR § 201.6(c)(4)(ii))<br>D3-a. Does the plan describe the process the community will follow to integrate the ideas, information and strategy of the mitigation plan into other planning mechanisms?<br>D3-b. Does the plan identify the planning mechanisms for each plan participant into which the ideas, information and strategy from the mitigation plan may be integrated?<br>D3-c. For multi-jurisdictional plans, does the plan describe each participant's individual process for integrating information from the mitigation strategy into their identified planning mechanisms? |
| Source: FEMA 2025 (Local) |

| Regulation Checklist- 44 CFR § 201.7 Tribal Mitigation Plans |
|---|
| **ELEMENT A. Planning Process** |
| A6. Does the plan include a description of the method and schedule for keeping the plan current (monitoring, evaluating, and updating the mitigation plan within the plan update cycle)? [44 CFR § 201.7(c)(4)(i)]<br>A7. Does the plan include a discussion of how the tribal government will continue public participation in the plan maintenance process? [44 CFR § 201.7(c)(4)(iv)] |
| Source: FEMA 2017 (Tribal) |

**Information on Plan Maintenance activities, including the annual review process and strategies for continued public involvement, can be found in each jurisdictional annex in Volume 2. Jurisdictional Annexes.**

## 5.1 Ongoing Integration of Indigenous Knowledge and Community Observations

Indigenous Knowledge, local and Tribal observations, and other community-provided information should continue to inform implementation and future updates of this MJHMP. As part of plan maintenance, participating jurisdictions should have opportunities to identify new observations, changes in environmental conditions, emerging vulnerabilities, and changes in community priorities that may affect the understanding of hazard risk or mitigation needs.

Information identified for additional validation or follow-up during development of this plan should be revisited as appropriate during annual reviews and future plan updates. New or updated information should be considered alongside scientific, technical, and historical information to determine whether changes are warranted to hazard profiles, vulnerability assessments, capability assessments, or mitigation actions.

Continued use of Indigenous Knowledge and community-provided information should respect Tribal and community authority over that knowledge, including preferences regarding validation, interpretation, mapping, attribution, and public disclosure of sensitive or location-specific information

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# A. Aleutians East Borough



A rainbow over Cold Bay
Photo Credit: Aleutians East Borough

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# A.1 Planning Team

## A.1.1 Planning Team

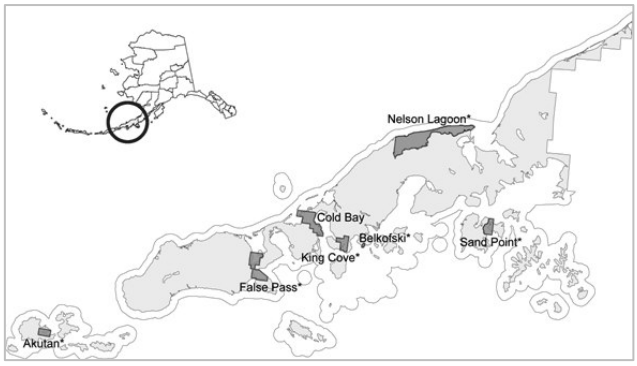
| Name | Role/Position |
|---|---|
| **Glennora Dushkin** | Executive Assistant |
| **Anne Bailey** | Administrator |
| **Michael Franklin** | School Superintendent |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

# A.2 Community Profile

## A.2.1 Location and Geography

The Aleutians East Borough is located in the southwestern portion of Alaska and contains 2,547 miles of wild and scenic coastline.

The six communities of the Aleutians East Borough with a year-round population are Akutan, Cold Bay, False Pass, King Cove, Sand Point, and Nelson Lagoon. There are several other historic Tribal villages throughout the Aleutians East Borough that are primarily used for subsistence activities in summer/fall months.




The Borough covers a large, geographically dispersed area of rugged volcanic islands, coastal mountains, tundra, and surrounding waters of the Bering Sea and North Pacific Ocean/Gulf of Alaska. Communities are generally small and isolated, with transportation and access shaped by the region's remote location, mountainous terrain, and challenging weather conditions. The Borough's geography is closely connected to the marine environment, which supports fishing, marine transportation, and other coastal activities and plays an important role in the daily life and economy of its residents.

Governmental operations of the Aleutians East Borough is based in Sand Point.

## A.2.2 History

The history of the Aleutians East Borough is deeply connected to the Unangax̂ (Aleut) people, who have lived in the Aleutian Islands and surrounding areas for thousands of years, since the last Ice Age.

Unangax̂ communities developed strong cultural and economic traditions centered on the ocean, including fishing, hunting, and gathering. Russian exploration and colonization began in the 18th century, bringing major changes to the region through the fur trade, settlement, and missionary activity.

After the United States purchased Alaska in 1867, communities in the Aleutians continued to rely heavily on fishing and other marine resources. During World War II, the region became strategically important, and the Aleutian Campaign brought military activity and the forced evacuation and internment of many Unangax̂ residents. In the decades following the war, communities rebuilt and continued to develop their fishing-based economies while preserving important Unangax̂ cultural traditions.

The Aleutians East Borough was established in 1987 and today encompasses several remote communities whose history remains closely tied to the land, sea, and Indigenous heritage of the Aleutian region.

## A.2.3 Population

The population of the Aleutians East Borough is estimated at 3,023 as of 2025 (DCRA 2026).

Individual community populations are estimated at:

- Akutan: 1,573
- Sand Point: 583
- False Pass: 398
- King Cove: 383
- Cold Bay: 47
- Nelson Lagoon: 31

## A.2.4 Demographics

The Borough has a diverse population, with the 2025 Census estimates reporting 35.0% White, 25.3% Asian, 18.6% American Indian and Alaska Native, 13.3% Black, and 6.5% identifying as two or more races. About 23.2% of residents identify as Hispanic or Latino, and 32.6% of residents age five and older speak a language other than English at home (US Census Bureau 2026).

The population is spread across several small, remote communities, contributing to the Borough's very low population density of about 0.5 people per square mile.

## A.2.5 Economy

The economy of the Aleutians East Borough is strongly centered on commercial fishing and seafood processing, which provide many of the region’s jobs and generate significant income.

Salmon, Pacific cod, halibut, crab, and other seafood are important to the local economy, while communities such as Sand Point, King Cove, Akutan, and False Pass have major seafood-processing facilities.

In 2023, seafood processing accounted for 2,801 workers and more than $102.5 million in wages in the Borough. Transportation, government, and other services also provide employment, while the region’s remote location and seasonal fishing activity have a major influence on economic conditions (Alaska Department of Labor and Workforce Development 2026).

Subsistence activities also contribute to household food supplies and the broader regional economy by reducing reliance on purchased foods and supporting continued use of locally harvested resources.

## A.2.6 Land Use

Land use in the Aleutians East Borough is shaped by its remote location, rugged terrain, and strong connection to the ocean. Most developed land is concentrated around the borough’s small communities and is used primarily for residential purposes, with smaller areas dedicated to commercial businesses, community facilities, transportation, and fishing-related activities.

Because developable land is limited by mountains, waterways, wetlands, and other geographic features, vacant land suitable for development is in short supply.

Outside the communities, much of the region remains relatively undeveloped and is used for commercial fishing, subsistence activities, recreation, wildlife habitat, and resource development. The borough regulates certain activities, including mining, seafood processing, commercial recreation, and resource exploration, through its land-use permitting system.

## A.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following jurisdictional-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **1986 Aleutians East Regional Government Feasibility Study** | Provides history of the AEB Region, profiles AEB communities, and discusses the government structure. | Used relevant information to develop the Community Profile. |
| **1994 Overall Economic Development Plan** | Provides long-term strategies for economic development and growth in the AEB and its communities. | Used relevant information to develop the Community Profile. |
| **2001 Transportation Improvement Plan** | Summarizes the development and results of a program to complete transportation improvement projects in the six AEB communities. | Used relevant information to develop the Community Profile. |
| **2010 & 2021 Aleutians East Borough MJHMP** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |

Source: State of Alaska Community Plans Library

# A.4 Risk Assessment

## A.4.1 Hazards

The Aleutians East Borough Planning Team identified the following natural hazards that may impact their geography.

- ✓ Hazard profiled for this jurisdiction in the MJHMP Update
- X Hazard not profiled for this jurisdiction in the MJHMP Update

| | | |
|---|---|---|
| X Changes in the Cryosphere- Sea Ice | ✓ Flood | ✓ Severe Weather |
| ✓ Changes in the Cryosphere- Snow Avalanche | ✓ Ground Failure/Landslide | ✓ Tsunami |
| ✓ Dam Failure | X Invasive Species | ✓ Volcano |
| ✓ Earthquake | ✓ Land Destabilization | X Wildland Fire |

Detailed hazard information for the entirety of the Aleutians East Borough is included within each hazard profile in **Volume 1. Base Plan.** Therefore, information on hazards selected to be profiled by the AEB are not included in this section.

## A.4.2 Critical Facilities

**Table A-1- Critical Facilities- Aleutians East Borough**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Aleutians East Borough | Education | 1000 | Sand Point School | 123 Red Cove, Sand Point AK | 55.351461 | -160.4756 | $38,379,381 | W2 | AEB | AEB | | | x | | x | | x | | x | | | |
| 2 | Aleutians East Borough | Government | 50 | Borough and School District Office (Sand Point) | 100 Mossberry Lane, Sand Point AK | 55.344238 | -160.4823 | $3,111,119 | W1 | AEB | AEB | | | x | | x | | x | | x | | | |
| 3 | Aleutians East Borough | Transportation | 0 | Sand Point Harbor | n/a | 55.330795 | -160.5030 | $60,000,000 | n/a | AEB | n/a | | x | x | | x | x | x | x | x | | | |
| 4 | Aleutians East Borough | Transportation | 0 | Nelson Lagoon Dock | n/a | 56.004426 | -161.1755 | $60,000,000 | n/a | AEB | n/a | | | x | | x | | x | | x | | | |
| 5 | Aleutians East Borough | Transportation | 0 | Cold Bay Dock | n/a | 55.205429 | -162.7005 | $60,000,000 | n/a | AEB | n/a | | | x | | x | | x | | x | | | |
| 6 | Aleutians East Borough | Transportation | 0 | Cold Bay Terminal | PO Box 67, Cold Bay AK 99571 | 55.207518 | -162.7223 | $7,045,300 | W2 | AEB | State of AK | | | x | | | | x | | x | | | |
| 7 | Aleutians East Borough | Education | 1000 | King Cove School | PO Box 69, King Cove AK 99612 | 55.047389 | -162.2961 | $31,871,802 | W2 | AEB | AEB | | | x | | x | | x | | x | | | |
| 8 | Aleutians East Borough | Education | 100 | False Pass School | 30 Main Street, False Pass AK | 54.853052 | -163.4187 | $6,976,502 | W2 | AEB | AEB | | x | x | | x | x | x | x | x | | | |
| 9 | Aleutians East Borough | Transportation | 0 | False Pass Harbor | n/a | 54.866495 | -163.4091 | $60,000,000 | n/a | AEB | n/a | | x | x | x | x | x | x | x | x | | | |
| 10 | Aleutians East Borough | Education | 100 | Akutan School | 202 Hilly Drive, Akutan AK | 54.135205 | -165.7734 | $7,361,187 | W2 | AEB | AEB | | x | x | | x | x | x | | x | | x | |
| 11 | Aleutians East Borough | Transportation | 0 | Akutan Harbor | n/a | 54.130196 | -165.8278 | $60,000,000 | n/a | AEB | n/a | | | x | | x | | x | x | x | | | |
| 12 | Aleutians East Borough | Transportation | 0 | Akutan Helicopter Hanger | n/a | 54.13173 | -165.8240 | $5,336,820 | S3 | AEB | City of Akutan, Aleut Corporation, Akutan Corporation, AEB | | | x | | x | | x | x | x | | | |
| **Total Occupants:** | | | **2,250** | | | **Total Estimated Value:** | | **$400,082,111** | | | | | | | | | | | | | | | |

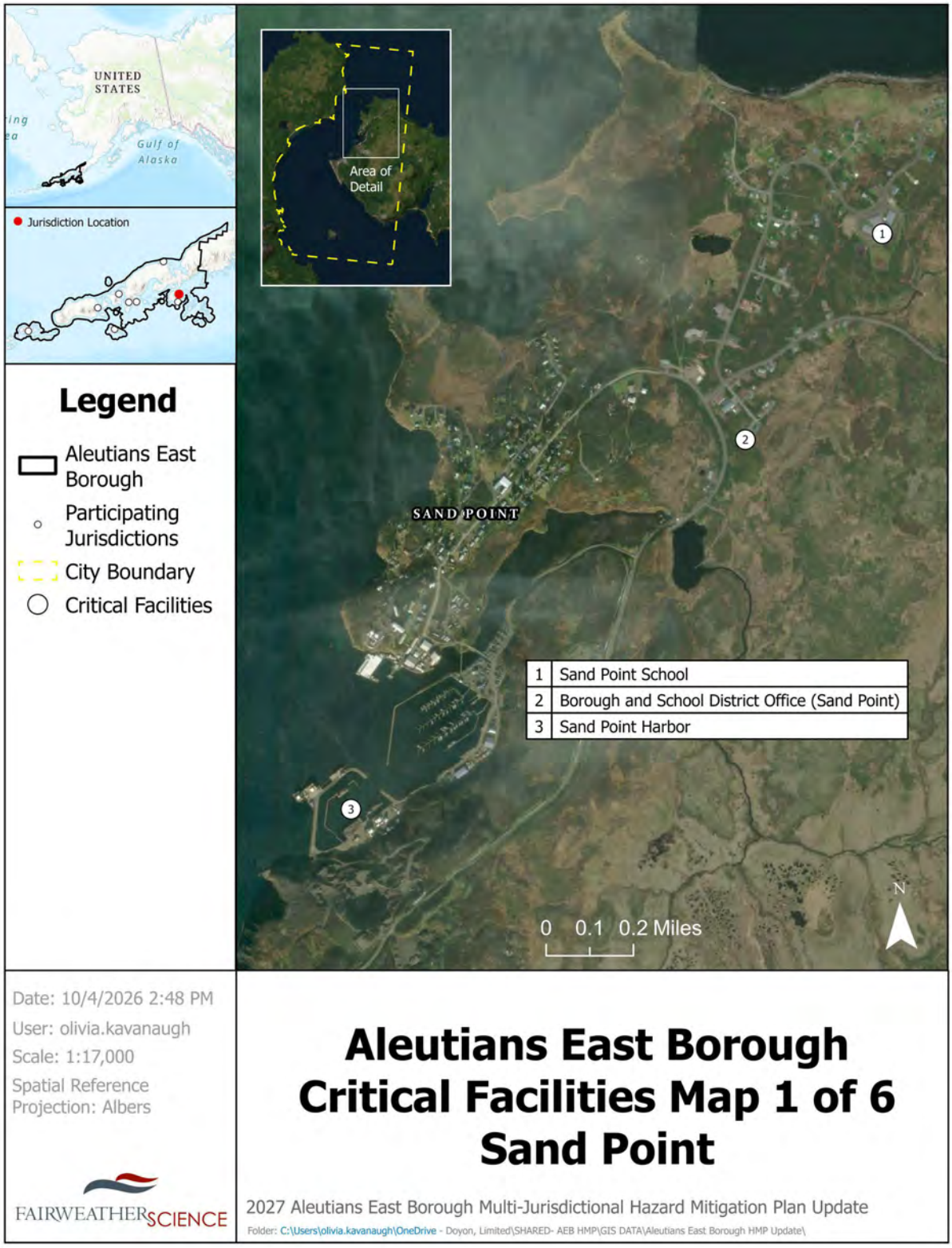



**Figure A-1- Aleutians East Borough Critical Facilities Map 1 of 6: Sand Point**




**Figure A-2- Aleutians East Borough Critical Facilities Map 2 of 6: Nelson Lagoon**

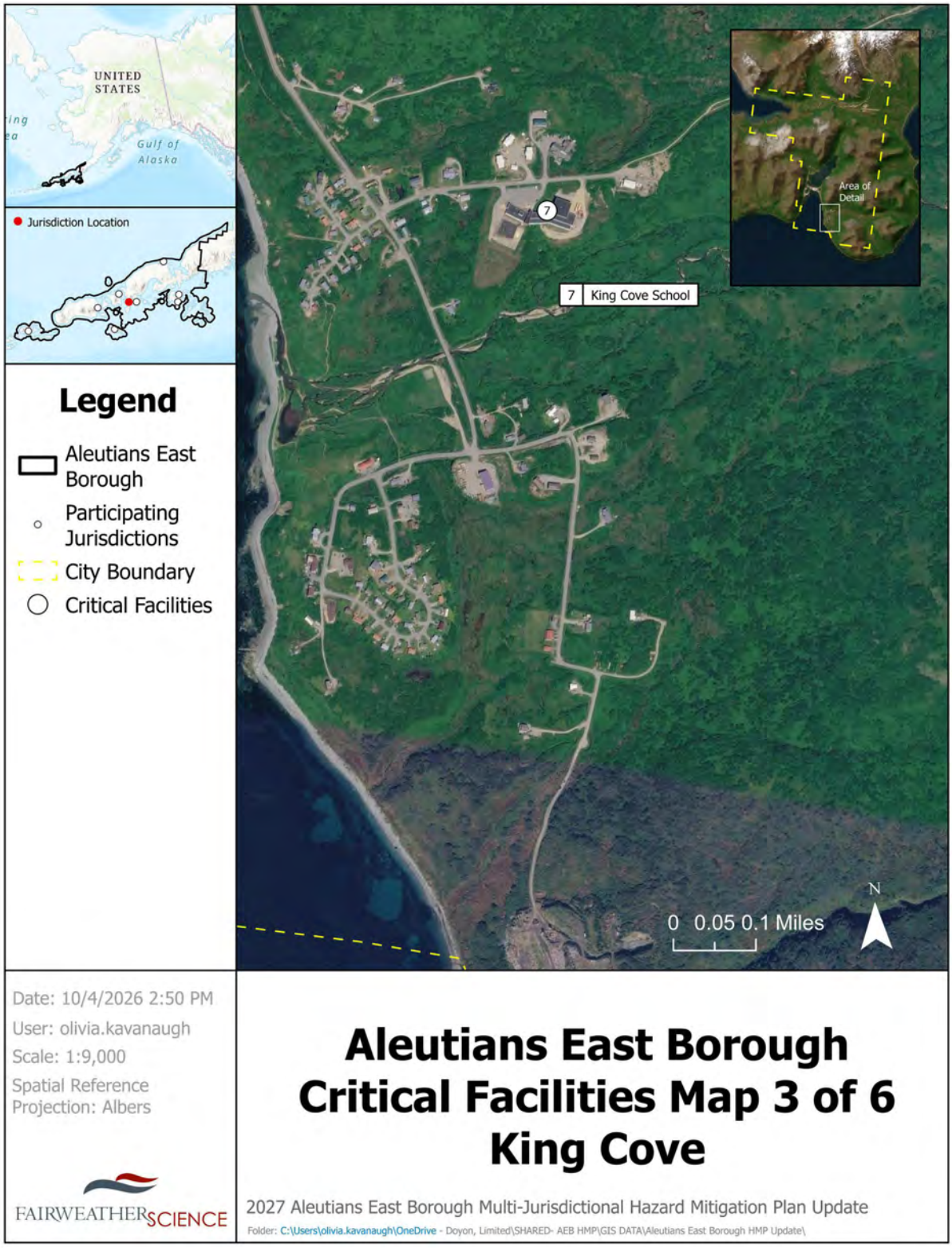



**Figure A-3- Aleutians East Borough Critical Facilities Map 3 of 6: King Cove**

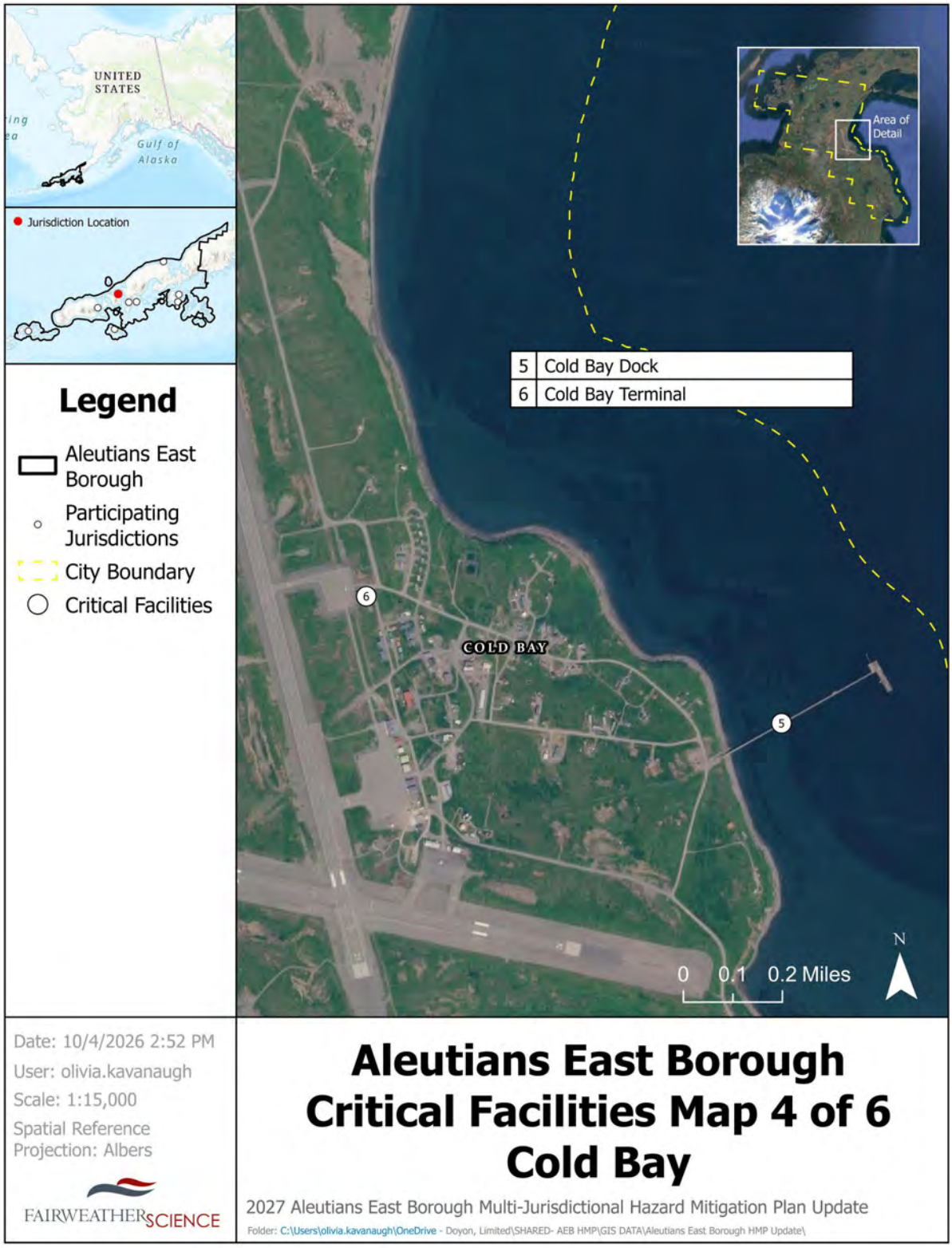



**Figure A-4- Aleutians East Borough Critical Facilities Map 4 of 6: Cold Bay**

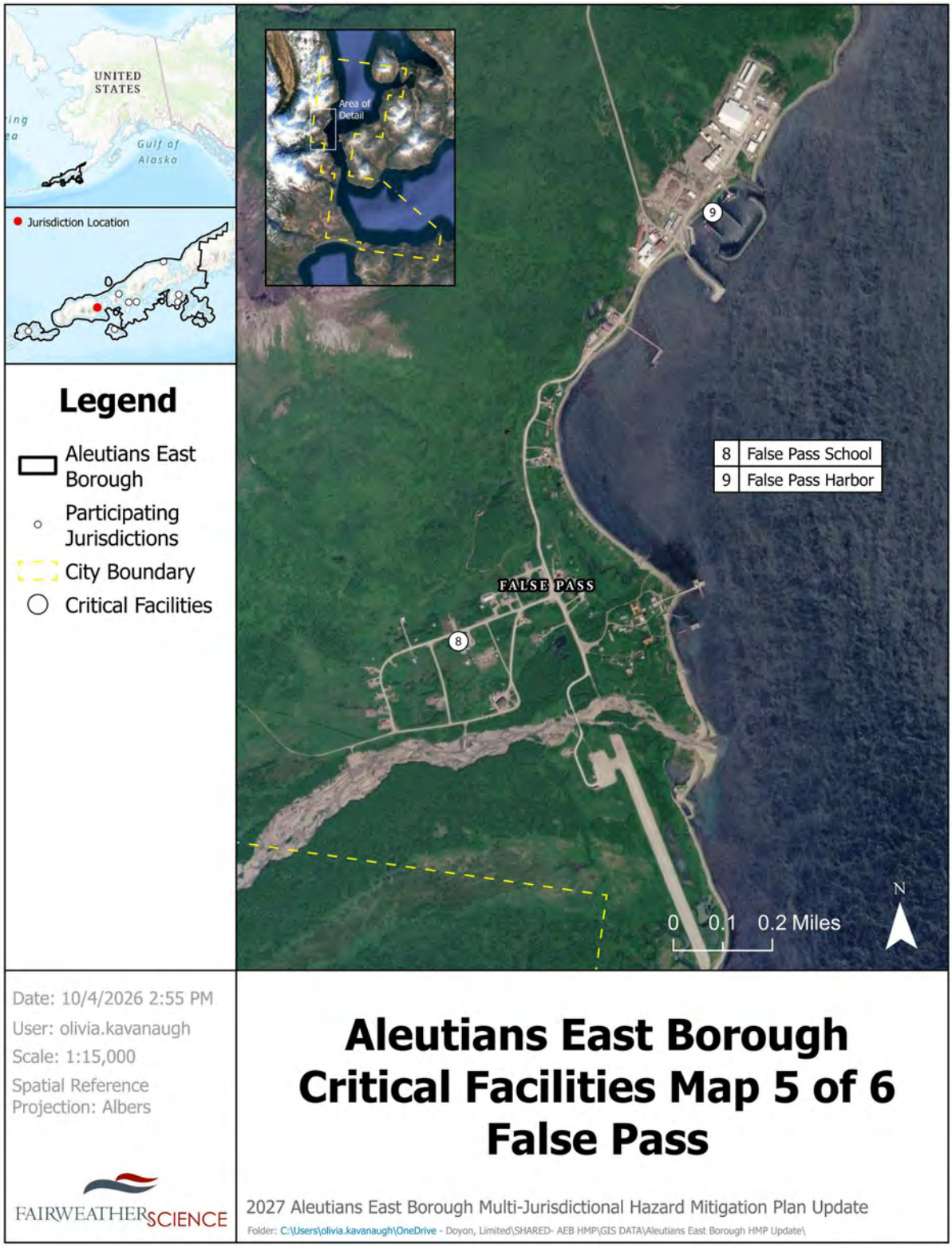



**Figure A-5- Aleutians East Borough Critical Facilities Map 5 of 6: False Pass**

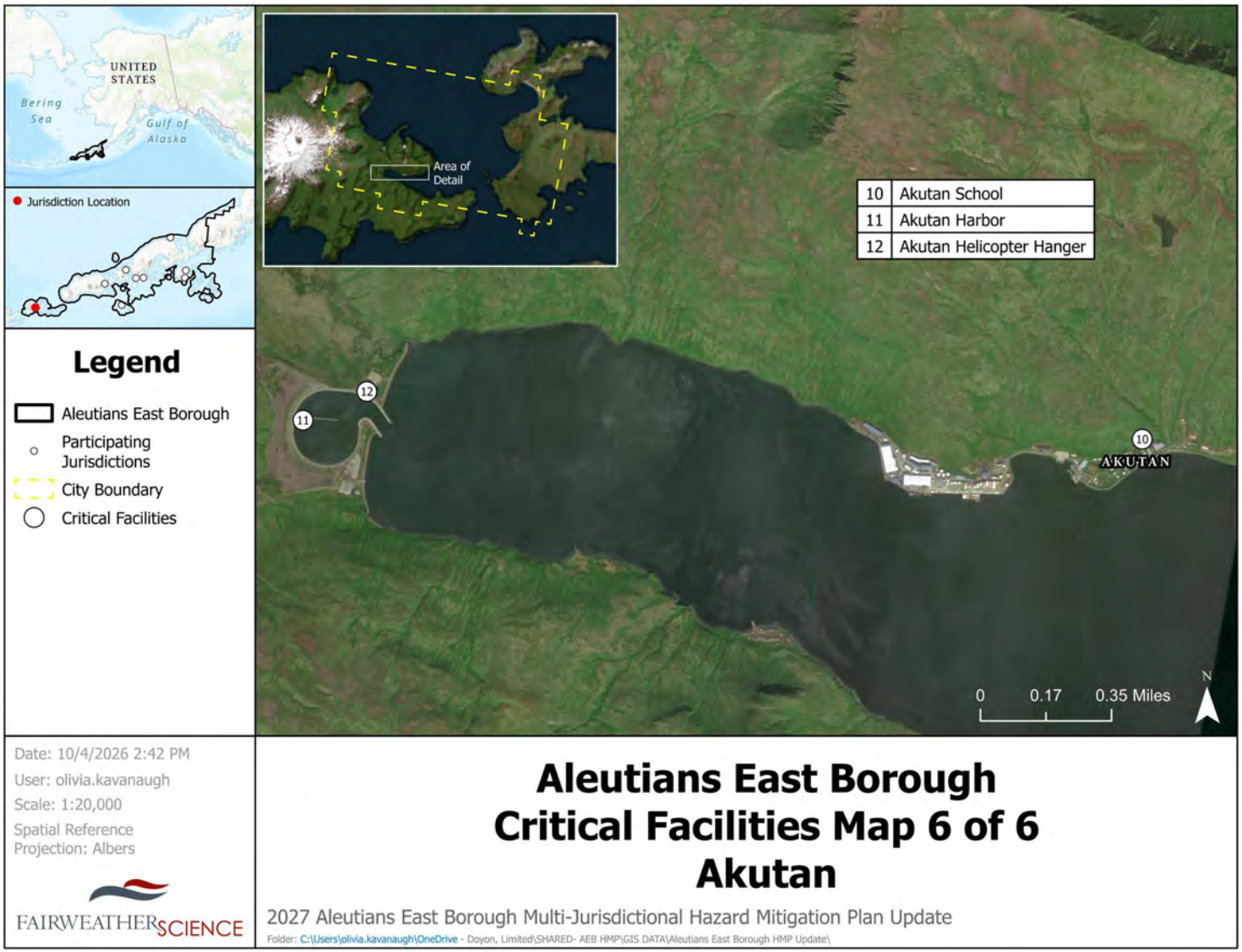



**Figure A-6- Aleutians East Borough Critical Facilities Map 6 of 6: Akutan**

## A.4.3 Summary of Vulnerability

**Table A-2- Jurisdictional Summary of Vulnerability- Aleutians East Borough**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere-Snow Avalanche | 4 | 200 | $134,337,689 | 46 | 184 | $33,344,848 |
| Earthquake | 12 | 2250 | $400,082,111 | 581 | 2,352 | $420,797,433 |
| Sediment Deterioration and Land Destabilization | 1 | 0 | $60,000,000 | 21 | 84 | $15,222,648 |
| Flood | 11 | 2250 | $393,036,811 | 519 | 2,100 | $375,129,489 |
| Ground Failure/ Landslide | 4 | 200 | $134,337,689 | 80 | 320 | $57,991,040 |
| Severe Weather | 12 | 2250 | $400,082,111 | 581 | 2,352 | $420,797,433 |
| Tsunami | 5 | 100 | $192,313,322 | 218 | 872 | $157,530,416 |
| Volcano | 12 | 2250 | $400,082,111 | 581 | 2,352 | $420,797,433 |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | 1 | 100 | $7,361,187 | 13 | 52 | $9,423,544 |
| Invasive Species | Did not profile this hazard | | | | | |

The Aleutians East Borough's vulnerability to natural hazards extends beyond potential damage to buildings and infrastructure. Communities throughout the Borough rely on surrounding lands and waters for subsistence and other locally important activities, and historic Tribal village areas continue to be used for subsistence purposes. Hazards that affect access to these areas, the availability of subsistence resources, or the environmental systems that support them may therefore create community consequences that are not represented in the quantitative exposure estimates above.

## A.5 Capability Assessment

***Note: the Aleutians East Borough does not participate in the National Flood Insurance Program (NFIP).***

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| **Plans** | | |
| Capital Improvements Plan | No | The Borough does not currently maintain a formal CIP. |
| Climate Change Adaptation Plan | No | |
| Community Wildfire Protection Plan | No | |
| Comprehensive/Master Plan | No | |
| Continuity of Operations Plan | No | |
| Economic Development Plan | Yes | Dated 1994 |
| Land Use Plan | No | |
| Local Emergency Operations Plan | No | |
| Stormwater Management Plan | No | |
| Transportation Plan | Yes | Dated 2001 |
| Other- Government Feasibility Study | Yes | Dated 1986 |
| **Land Use Planning and Ordinances** | | |
| Acquisition of land for open space and public recreation use | No | |
| Building code | No | |
| Flood insurance rate maps | No | |
| Floodplain ordinance | No | |
| Substantial Damage Plan | No | |
| Natural hazard specific ordinance (stormwater, steep slope, wildfire) | No | |
| Subdivision ordinance | No | |
| Zoning ordinance | No | |
| **Administrative** | | |
| Chief Building Official | No | The Borough does not have this position |
| Civil Engineer | No | |
| Community Planner | No | |
| Emergency Manager | No | |
| Floodplain Administrator | No | |
| GIS Coordinator | No | |
| Planning Commission | Yes | The Borough Assembly acts as the planning committee as needed. |

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| **Technical** | | |
| Grant writing | Yes | Borough staff |
| Hazard data and information | Yes | The Borough has access to hazard data through the Hazard Mitigation Plan |
| GIS analysis | No | |
| Mutual aid agreements | No | |
| **Funding Resources** | | |
| Capital improvements project funding | Yes | |
| Community Development Block Grant | Yes | |
| Federal funding programs (non-FEMA) | Yes | |
| Fees for water, sewer, gas, or electric services | No | The Borough does not collect any fees from residents |
| Impact fees for new development | No | |
| State funding programs | Yes | |
| Stormwater utility fee | No | |
| **Community Programs/Organizations** | | |
| Community newsletters | Yes | The Borough has a newsletter |
| Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events) | No | |
| Local news | No | |
| Organizations that represent/advocate for/interact with underserved and vulnerable communities/populations | No | Coordinates with regional entities |
| Social media | Yes | The Borough has social media accounts |

The Borough's regional role also provides opportunities to support coordination among participating communities and Tribes in identifying locally important hazard information, vulnerabilities, and mitigation priorities. Community and Indigenous Knowledge may complement Borough access to technical hazard information by documenting locally observed conditions, environmental changes, traditional access concerns, and other community values that may not be fully represented in regional datasets.

# A.6 Mitigation Strategy

## A.6.1 Mitigation Goals

The Aleutians East Borough has identified its goals related to hazard mitigation as:

1. Support community actions that reduce risks to the lives and property from natural hazards.
2. Protect and enhance the resilience of Borough critical facilities, infrastructure, and essential services.
3. Support Borough communities in reducing hazard vulnerability through mitigation, public outreach, education, and capacity building.
4. Integrate hazard mitigation and resilience into Borough and community planning, development, and decision-making.

## A.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

The Aleutians East Borough reviewed mitigation actions identified in the 2021 AEB HMP and provided a status update for each action.

- ***Completed***- this action has been completed
- ***In Progress/Ongoing***- this action has been started is currently in-progress or ongoing
- ***Not Started***- this action has not been started

| ID | Action | Status |
|---|---|---|
| **1** | Conduct mock emergency exercises to identify response vulnerabilities (i.e., Great Alaska Shakeout). | Ongoing |
| **2** | Complete inundation mapping. Considering pursuing tsunami readiness designations. | Complete. All AEB communities have inundation mapping as of 2026. |
| **3** | Continue to support publication of volcano hazard assessments for Alaska's active volcanoes. | Ongoing |
| **4** | Research and consider instituting the National Weather Service program of "Storm Ready". | Ongoing |
| **5** | Support communities with their efforts to mitigate erosion. | Ongoing. AEB will support its communities in their decisions. |

## A.6.3 2027 Mitigation Action Plan

**Table A-3- 2027 Mitigation Action Plan- Aleutians East Borough**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | All Hazards | Support efforts to collect hazard data, monitor hazards, and incorporate community-provided observations and locally relevant information where appropriate. | M | AEB Administration Department | USGS, NOAA, HMA, DGGS, Denali Commission, APIA | Other | All | 5-10 years | B/C: Continuous monitoring increases early warning capability and reduces hazard losses. TF: Ongoing; can phase equipment installation and data management. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP, Regional Adaptation Plan |
| **2** | All Hazards | Research building codes and consider implementing Borough-wide building code, best practices, and/or guidance. To include requiring new infrastructure projects to be inspected by 3rd party inspector to confirm build meets minimum building code requirements, specifications, and best practices. | H | AEB Administration Department | HMA, DHS&EM, ICC | Plans and Regulations | All | 5-10 years | B/C: Strong building codes substantially reduce long-term damage and recovery costs. TF: Phased timeline for research, adoption, and training. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **3** | All Hazards | Limit, restrict, and/or mitigate construction of new AEB facilities to reduce known hazard risk. | M | AEB Administration Department | HMA, USACE, Denali Commission | Plans and Regulations | All | 5-10 years | B/C: Avoidance is the most cost-effective mitigation strategy. TF: Long timeline; connected to planning, zoning, and project-development cycles. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **4** | Cryosphere - Snow Avalanche | Continue to utilize appropriate methods of structural avalanche control where needed, such as snow fences and diversion structures | H | AEB Administration Department | HMA, USACE, State of Alaska DOT&PF, Denali Commission | Structure and Infrastructure Projects | All | 3-4 years | B/C: Proven methods reduce avalanche impacts to roads and facilities. TF: Seasonal installation and maintenance considerations. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **5** | Cryosphere - Snow Avalanche | Consider coordinating with State and Federal agencies to conduct comprehensive landslide/avalanche hazard assessments throughout the AEB to better understand risk and hazard areas. | L | AEB Administration Department | HMA, DGGS, USGS, USACE | Other | All | 5-10 years | B/C: Better hazard data improves long-term mitigation planning and cost efficiency. TF: Long timeline involving field data, modeling, and inter-agency partnerships. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **6** | Dam Failure | Coordinate with dam owners to spread public awareness about dam risk in AEB communities. | M | AEB Administration Department | FEMA Dam Safety Program, State Dam Safety Office, DHS&EM, APIA | Education and Awareness Programs | Dam, Critical Facilities in inundation zones | 3-4 years | B/C: Awareness reduces casualties during dam emergencies; very low cost. TF: Short timeline; can be integrated into other outreach efforts. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **7** | Dam Failure | Support the installation of dam failure evacuation signage in AEB communities, where applicable. | M | AEB Administration Department | FEMA Dam Safety Program, HMA, State of Alaska, AEB | Education and Awareness Programs | Dam, Critical Facilities in inundation zones | 3-4 years | B/C: Signage provides life-saving evacuation guidance. TF: Timeline subject to phased signage fabrication and installation. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **8** | Earthquake | Install earthquake straps on heavy/tall furniture in critical facilities to reduce the potential of damage/injuries during an earthquake. | M | AEB Administration Department | HMA, DHS&EM, Denali Commission, APIA | Structure and Infrastructure Projects | All | 0-2 years | B/C: Low-cost mitigation with strong life-safety benefit during seismic events. TF: Quick implementation; can be completed during routine facility maintenance. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP, APIA CRRC Outreach |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **9** | Earthquake, Tsunami | Where high ground is scarce and no existing community emergency shelter is designated, support community efforts to construct multi-use buildings engineered to withstand tsunamis and earthquakes. | M | AEB Administration Department | HMA, USACE, EDA Public Works, Denali Commission | Structure and Infrastructure Projects | Multi-Use Buildings | 5-10 years | B/C: Provides life-safety protection in communities lacking natural refuge; long-term resilience may outweigh construction costs.<br>TF: Multi-year timeline; requires engineering, site selection, and agency coordination. | Existing plans: Borough Assembly Documents and Project Lists<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **10** | Flood | Support flood mapping projects throughout the AEB to mitigate flood risk. | M | AEB Administration Department | FEMA RiskMAP, HMA, USACE, DGGS, ANTHC | Structure and Infrastructure Projects | All | 5-10 years | B/C: Improved mapping allows targeted flood mitigation and reduces unexpected losses.<br>TF: Phased timeline for communities; depends on survey and modeling schedules. | Existing plans: Borough Assembly Documents and Project Lists<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **11** | Ground Failure/ Landslide, Cryosphere - Snow Avalanche | Support LiDAR and other mapping projects so that landslide and snow avalanche risk can be better understood throughout the AEB. | L | AEB Administration Department | USGS, HMA, NOAA, DGGS | Other | All | 5-10 years | B/C: High-resolution data significantly improves hazard modeling and mitigation strategy accuracy.<br>TF: Timeline dependent on field seasons and data processing. | Existing plans: Borough Assembly Documents and Project Lists<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **12** | Sediment Deterioration and Land Destabilization | Support communities with their efforts to mitigate erosion. | H | AEB Administration Department | USACE, HMA, Denali Commission, NOAA Coastal Resilience, APIA | Structure and Infrastructure Projects | All | 5-10 years | B/C: Erosion prevention protects infrastructure and reduces long-term relocation costs.<br>TF: Multi-year and phased engineering/construction timelines; requires coordination with multiple agencies. | Existing plans: Borough Assembly Documents and Project Lists<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP, EPA GAP Workplan |
| **13** | Sediment Deterioration and Land Destabilization | Support comprehensive erosion assessments throughout the AEB. | M | AEB Administration Department | USACE, HMA, NOAA, Denali Commission | Other | All | 5-10 years | B/C: Identifies priority areas for targeted mitigation; reduces future project costs.<br>TF: Timeline subject to field seasons and technical capacity. | Existing plans: Borough Assembly Documents and Project Lists<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **14** | Sediment Deterioration and Land Destabilization | Support communities in their efforts to harden shorelines in vulnerable areas to reduce further shoreline loss. This project will require coordination with State and Federal agencies to determine the most effective mitigation method in various communities. | M | AEB Administration Department | USACE, FEMA HMA, NOAA Coastal Resilience, Denali Commission | Structure and Infrastructure Projects | Coastal Infrastructure | 5-10 years | B/C: Protects homes and critical infrastructure from long-term erosion.<br>TF: Multi-year; permitting and construction phases required. | Existing plans: Borough Assembly Documents and Project Lists<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **15** | Severe Weather | Research and consider instituting the National Weather Service program of "Storm Ready". | L | AEB Administration Department | NOAA/NWS StormReady Program, FEMA HMA, DHS&EM | Education and Awareness Programs | All | 3-4 years | B/C: Enhances early-warning capacity and community preparedness at low cost.<br>TF: Short timeline; primarily administrative and training requirements. | Existing plans: Borough Assembly Documents and Project Lists<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **16** | Severe Weather | Install wind shutters on AEB critical facilities | M | AEB Administration Department | HMA, EDA, Denali Commission, State of Alaska | Structure and Infrastructure Projects | All | 3-4 years | B/C: Protects structures against wind damage; reduces long-term repair costs.<br>TF: Installation can be phased and done seasonally. | Existing plans: Borough Assembly Documents and Project Lists<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **17** | Severe Weather | Conduct an assessment of snow loading capacity on roofs of AEB critical facilities. Retrofit as needed to meet snow loading recommendations. | L | AEB Administration Department | HMA, USACE, State of Alaska, Denali Commission | Structure and Infrastructure Projects | All | 5-10 years | B/C: Prevents roof collapse and critical-facility outages; high value mitigation.<br>TF: Phased timeline for engineering assessment and retrofit work. | Existing plans: Borough Assembly Documents and Project Lists<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **18** | Tsunami | Inventory community tsunami readiness designations and consider assisting with designations for communities that do not have it. | L | AEB Administration Department | NOAA TsunamiReady Program, HMA, DHS&EM, NWS Tsunami Program, APIA | Other | All | 0-2 years | B/C: Improved preparedness reduces casualties and enhances emergency-response efficiency. TF: Short timeline; designation support mostly administrative. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP, APIA CRRC Outreach |
| **19** | Tsunami | Inventory communities with tsunami sirens and consider supporting other communities that need them. | L | AEB Administration Department | HMA, DHS&EM, NOAA Tsunami Program, USACE | Other | All | 3-4 years | B/C: Sirens significantly improve warning dissemination and evacuation success. TF: Medium timeline for system procurement, installation, and testing. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **20** | Tsunami | As the AEB plans to downsize the False Pass school, take into consideration site selection and/or building strategies that minimize hazard risk (build outside of tsunami hazard area). | M | AEB Administration Department | No funding required | Structure and Infrastructure Projects | False Pass School | 3-4 years | B/C: This project would reduce tsunami risk by prioritizing school site and building strategies outside the tsunami hazard area, while potentially providing a safe evacuation location for the community. TF: This project is technically feasible through coordination with AEB and consideration of land ownership, available sites, and site conditions outside the tsunami hazard area. | Existing plans: Borough Assembly Documents and Project Lists, School District Plans |
| **21** | Volcano | Continue to support publication of volcano hazard assessments for Alaska's active volcanoes. | H | Borough Administrator | USGS Volcano Hazards Program, HMA, State of Alaska DGGS | Other | All | 0-2 years | B/C: Accessible hazard information improves decision-making and reduces losses. TF: Recurring project; timelines tied to scientific survey schedules. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **22** | Volcano | In the case of HVAC system failure, consider installing ash-rated HVAC systems in AEB critical facilities. | M | AEB Administration Department | HMA, USGS Volcano Hazards Program, EDA Public Works, State of Alaska | Structure and Infrastructure Projects | All | 5-10 years | B/C: Protects essential facilities from ash infiltration, preventing costly downtime. TF: Timeline involving HVAC design, procurement, and installation. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP |
| **23** | Volcano | Develop education and outreach materials about staying safe in the event of an ashfall event and distribute these. | M | AEB Administration Department | HMA, USGS Volcano Hazards Program, NOAA/NWS, ANTHC, APIA | Education and Awareness Programs | All | 0-2 years | B/C: Very cost-effective; improves resident preparedness for ashfall impacts. TF: Short timeline; information can be produced and distributed quickly and at low cost. | Existing plans: Borough Assembly Documents and Project Lists Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP, Regional Adaptation Plan, EPA GAP Outreach |

### A.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Conduct mock emergency exercises to identify response vulnerabilities (i.e., Great Alaska Shakeout). | This action would be completed at a local level. |
| Conduct an inventory of AEB-owned high occupancy buildings and critical facilities that need seismic retrofitting. | This action would be completed at a local level. |
| Where high ground is scarce and no existing community emergency shelter is designated, support construction of multi-use buildings engineered to withstand tsunamis and earthquakes. | This action would be completed at a local level. |
| Regularly update tsunami inundation zones. | All communities have formal inundation mapping. Any updates would be completed by UAF/AEC as part of the National Tsunami Hazard Mitigation Program under the National Weather Service. |
| Relocate AEB critical facilities out of tsunami inundation areas | Relocation is likely not feasible due to scarcity of available land. Hardening is more feasible. |
| Move critical infrastructure out of zones vulnerable to inundation and land destabilization. | Relocation is likely not feasible due to scarcity of available land. |
| Complete a study of critical infrastructure most vulnerable to coastal flooding and identify strategies to mitigate this. | This action would be completed at a local level. |
| Relocate critical facilities and homes out of known avalanche areas. | Relocation is likely not feasible due to scarcity of available land. |
| Coordinate with dam owners to complete dam engineering assessments to identify inundation areas. | This action would be completed at a local level by the dam owners. The AEB does not own any dams. |
| Coordinate with dam owners to develop and regularly maintain/update Emergency Action Plans for High and Significant Hazard Dams in the AEB. | This action would be completed at a local level by the dam owners. The AEB does not own any dams. |
| Research building codes and the possibility of implementing Borough-wide building code, best practices, and/or guidance. | Establishing a building code is not feasible at this time. |
| Limit, restrict, and/or mitigate construction of new facilities to reduce known hazard risk. | This action would be completed/enforced at a local level. |
| Install backup generators in all AEB schools. | Schools are equipped with generators. |
| Partner with APIA to map and educate about tsunami risk across AEB communities. These efforts are intended to inform preparedness activities, such as identifying which communities need tsunami sirens. | This action would be completed at a local level. |

# A.7 Plan Update

## A.7.1 Changes in Development, including in Hazard-Prone Areas (Current and Future)

### A.7.1.1 Changes in Development Since 2021

There has been little development in the Aleutians East Borough between 2021 and 2026, and the Borough's overall vulnerability to natural hazards has not significantly changed.

### A.7.1.2 Future/Planned Development

The Aleutians East Borough is planning to replace the False Pass School in the coming years as the current school is too large for the current school population.

A road connecting the communities of King Cove and Cold Bay is planned to allow residents of King Cove to access the Cold Bay airport and other essential services.

These planned developments are not anticipated to increase or decrease the Aleutians East Borough's vulnerability to natural hazards.

## A.7.2 Changes in Priorities and Mitigation Efforts

The Borough's priorities and mitigation efforts in the previous HMP focused on preparedness, hazard mapping and assessments, community outreach, and identifying response vulnerabilities through exercises and hazard-specific programs.

The Borough's priorities and goals in this HMP shift towards brick-and-mortar mitigation projects, supporting communities with hazard mitigation efforts, and hardening AEB critical infrastructure to reduce vulnerability and improve resilience.

# A.8 Plan Maintenance

## A.8.1 Planning Team MJHMP Maintenance Commitment

The Aleutians East Borough is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.6.

The Aleutians East Borough is committed to annually reviewing the Plan and AEB staff will work to complete their review responsibilities.

## A.8.2 Continued Public Involvement

The Aleutians East Borough is dedicated to continued public involvement over the next five years.

The Aleutians East Borough will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2031.

Public and jurisdictional engagement during annual reviews should also provide opportunities for participating communities and Tribes to identify new local observations, environmental changes, traditional access concerns, subsistence-related impacts, and other community knowledge relevant to hazard mitigation. Engagement methods should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where Indigenous Knowledge or other community-provided information is considered for incorporation into the MJHMP, appropriate attention should be given to community review, attribution, sensitivity, and preferences regarding public disclosure.

## A.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The Aleutians East Borough jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The AEB Executive Assistant (Administration Department) will be responsible for coordinating and facilitating the annual review each year.**

#### A.8.3.1.1 Implementing

Upon adoption of the Plan, the Aleutians East Borough will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The Borough will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### A.8.3.1.2 Monitoring

The Aleutians East Borough will monitor the progress of mitigation actions on an annual basis. The AEB Executive Assistant will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### A.8.3.1.3 Evaluating

The Aleutians East Borough will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

### A.8.3.1.4 Updating

The Aleutians East Borough will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.6(c)(4)(i). The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Annual and five-year reviews should also consider whether new Indigenous Knowledge, local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

Figure A-7 provides a visual of the HMP plan maintenance activities per year.

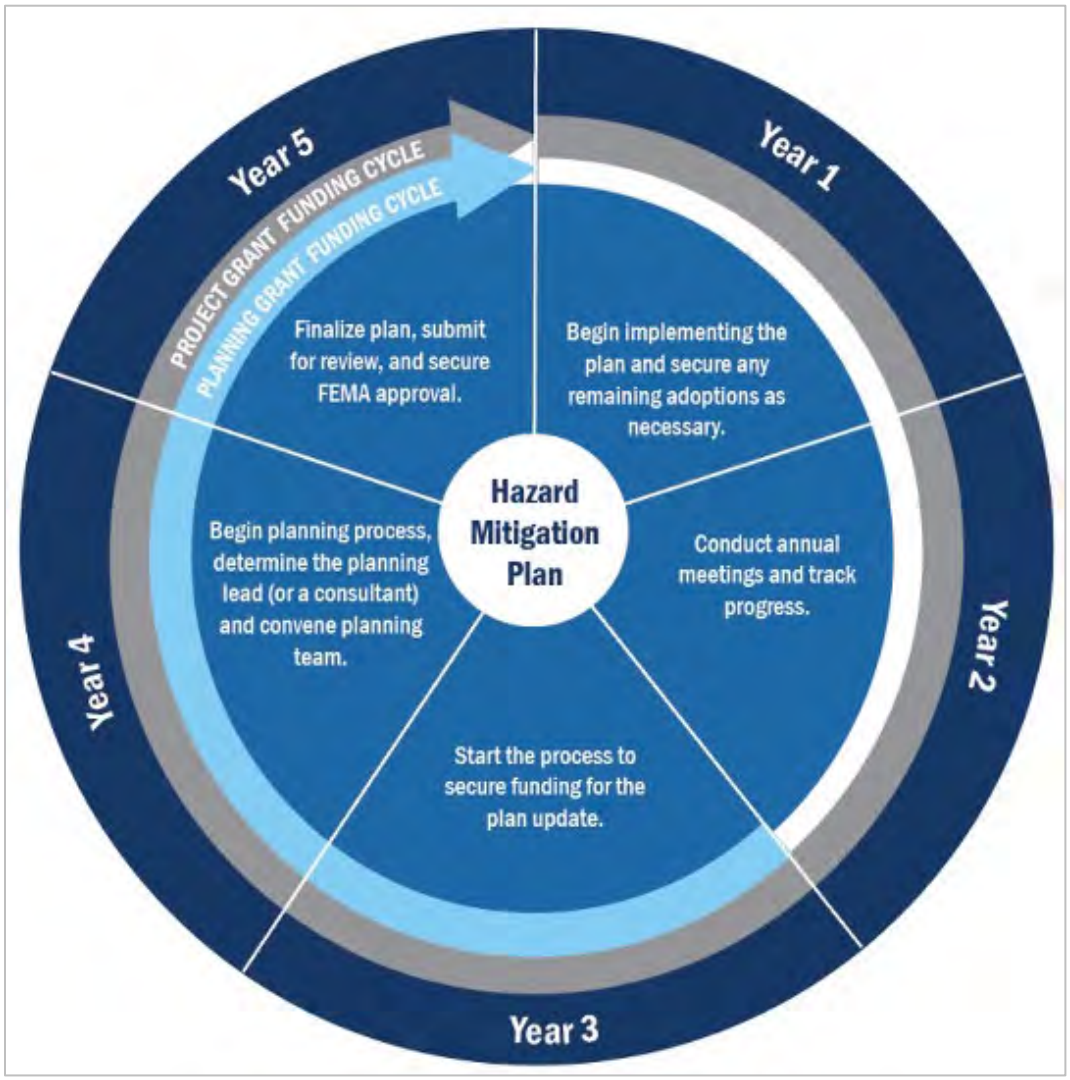



**Figure A-7- HMP Update Schedule**

## A.8.4 Plan Integration

The Aleutians East Borough will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other planning and implementation processes, when appropriate.

The Borough will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the Borough's comprehensive and land use planning processes, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects.

As the plan is implemented, the Aleutians East Borough will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## A.9 Plan Adoption

The Aleutians East Borough Assembly formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

[insert signed adoption resolution]

# B. City of Akutan



Photo Credit: Aleutians East Borough

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# B.1 Planning Team

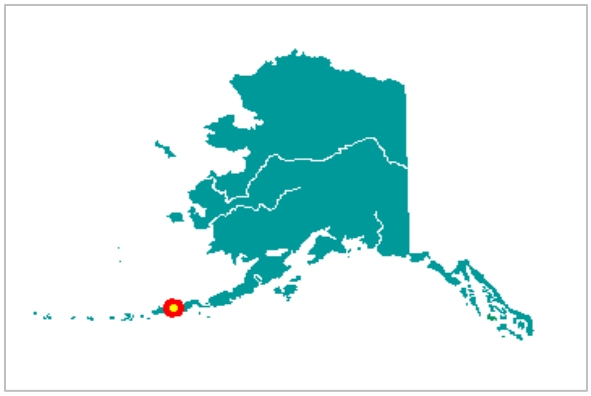
## B.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Farha Karim** | City Administrator/Planning/Grant Writer |
| **Matthew Bereskin** | Harbor Master |
| **Sarah Bereskin** | Utility Clerk |
| **Joseph Berkeskin** | Mayor/Elder Representative |
| **Karen Ravenscroft** | Teacher |
| **Natasha Bereskin** | Youth Representative |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

# B.2 Community Profile

## B.2.1 Location and Geography

Akutan is located 766 air miles southwest of Anchorage and 35 miles east of Unalaska and is one of the Krenitzin islands within the Fox Island group, located at approximately 54.1338º north latitude and -165.7768º west longitude. The city has 65.58 square miles of land and 82.33 square miles of water. The city is the only settlement on Akutan Island and encompasses land on neighboring Akun Island.



## B.2.2 History

Akutan is located on Akutan Island, on the site of a traditional Unangan village. As a modern townsite, it was founded in 1878 as a fur storage and trading port for the Western Fur and Trading company. The company's agent established a commercial cod fishing and processing business that quickly attracted nearby Unangan to the community. A Russian Orthodox church and a school were built in 1878. Alexander Nevsky Chapel was built in 1918 to replace the original structure. After the banning of sea otter hunting in 1911, The Pacific Whaling Company built a whale processing station across the bay from Akutan in 1912. It was the only whaling station in the Aleutians and operated until 1939, when it closed due to market pressures. Commercial cod fishing continued, following the closure of the whaling station. After the Japanese attacked Unalaska in June 1942, the United States (U.S.) government evacuated Akutan residents to the Ketchikan area. The community was re-established in 1944, although many residents chose not to return. Despite the disruption of relocation, war-time damage from U.S. military occupation, and re-population with a much smaller population, the fisheries industry flourished following the war. The community was officially incorporated in 1979.

## B.2.3 Population

The 2020 decennial census recorded a population of 1,589. The DCRA community profile states that roughly 75 people in total are year-round residents, while the difference is seasonal and transient workers. Similarly, the 2024 American Community Survey Demographic and Housing Estimates recorded a total population of 649 with a margin of error of ±273.

## B.2.4 Demographics

Though the population estimates vary significantly between sources, the 2024 ACS reports a demographic composition of 27.8% White alone, 13.5% Black or African American alone, 21.5% American Indian and Alaska Native alone, 16.4% Asian Alone, and 14% of some other race, with 6.8% of the population reported as two or more races. 16.1% of the population identifies as Hispanic or Latino, and 63.9% of the population speaks a language other than English in the home.

## B.2.5 Economy

Since the modern founding of the community of Akutan, the economy of the region has centered on the harvest of wildlife. Initially, the harvest focused on fur trapping and storage; but this quickly shifted to commercial fisheries. After the banning of sea otter hunting in 1911, The Pacific Whaling Company built a whale processing station across the bay from Akutan in 1912. It was the only whaling station in the Aleutians and operated until 1939, when it closed due to market pressures. Commercial cod fishing continued, following the closure of the whaling station. Following the close of World War II, the community started its recovery and repopulation. The fisheries industry flourished in the late 40s, supporting 13 floating processors and employing the local population. In the 1980s, the crab industry declined; but Trident Seafoods assumed management of an existing shore-based plant, processing mostly frozen pollock.

Trident has been an APICDA partner since 1992, supporting economic development in the community. However, Akutan residents tend not to work in the plant itself and instead hold support positions for the facility. Additionally, Trident Seafoods is building a replacement facility in Unalaska which would serve as the replacement for the Akutan facility.

Other local employment is limited. As of 2012, only seven local residents held commercial fishing licenses. Non-fishing employment include government positions, boat piloting, local service industry, diving, and halibut or cod/finfish permitted fishing. There have also been investments and discussions on development of mariculture farms supporting mussels, abalone, and oysters as well as improvements made to Akun island to support cattle farming. As of 2012, there were roughly 1,000 head of cattle on the island.

In addition to the current local employment opportunities, in 2012 and 2013 respectively the Akutan airport on Akun Island and a public dock and mooring basin opened, opening the community to greater transportation. The main employers in the community are Trident Seafoods, City of Akutan, Aleutian East Borough School District, Native Village of Akutan, and Akutan Corporation.

Subsistence harvesting also contributes to household food supplies and complements the community's strong connection to commercial fisheries and marine resources.

### B.2.6 Land Use

As an incorporated 2nd class city, Akutan has the ability but not the requirement to enact and enforce planning, platting, and land use regulation. Title 8 of the Akutan Municipal Code covers these responsibilities.

Title 8 establishes the Planning Commission, made up of five residents representing five separate interests: the city, the public, the Traditional Council, fisheries, and the Akutan Corporation. These members are chosen for three-year terms by the mayor, who also serves as an ex-officio voting member. The commission is led by a chair and vice-chair elected by members of the commission itself. This commission has the power to produce zoning maps, investigate and address variance requests, and produce 5-year development plans for the city, among other related powers.

## B.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following community-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **1982 City of Akutan Comprehensive Plan** | Provides details on the overall vision for the City, including historical photographs | Used relevant information to develop the Community Profile |
| **2005 City of Akutan Community Plan** | Provides details on the history, economy, land use, critical facilities, and local/regional partners in Akutan | Used relevant information to develop the Community Profile |
| **2007 Akutan Capital Projects** | List of capital projects the City was planning to complete | Reviewed list of past projects for suggestions in the Mitigation Action Plan |
| **2010 & 2021 Aleutians East Borough MJHMP** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **2026 PND Akutan Beach Erosion Mitigation Project August 2026 Project Update** | Current status of the Project, items completed and remaining to be completed | Used current condition assessment and photos in the Sediment Deterioration and Land Destabilization hazard profile |

Source: State of Alaska Community Plans Library, City of Akutan/PND Engineers

# B.4 Risk Assessment

## B.4.1 Hazards

The City of Akutan Planning Team identified the following natural hazards that may impact their geography/community.

✓ Hazard profiled for this jurisdiction in the MJHMP Update
X Hazard not profiled for this jurisdiction in the MJHMP Update

X Changes in the Cryosphere- Sea Ice
✓ Changes in the Cryosphere- Snow Avalanche
✓ Dam Failure
✓ Earthquake
✓ Flood
✓ Ground Failure/Landslide
X Invasive Species
✓ Land Destabilization
✓ Severe Weather
✓ Tsunami
✓ Volcano
✓ Wildland Fire

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere- Sea Ice | Did not profile this hazard | | |
| Cryosphere- Snow Avalanche | 2- Possible | 4- Catastrophic | Akutan is vulnerable to avalanches due to its steep and rugged mountainous terrain, heavy snowfall, strong winds, and rapidly changing winter weather conditions. Avalanches can occur on steep slopes and may be triggered by heavy snowfall, wind loading, rain, warming temperatures, or seismic activity.<br>Due to a lack of LiDAR data, or other forms of mapping, avalanche hazard areas and risk in Akutan are not well defined.<br>The Planning Team reports that an avalanche occurred on March 20th, 2012, on a hillside, impacting houses below. This avalanche completely covered the backside of two houses. Members of the community had to shovel out the windows so the pressure wouldn't break the windows. |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485 mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and Akutan itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 3- Likely | 2- Limited | Sediment deterioration and land destabilization can occur throughout Akutan, with coastal land destabilization being the biggest concern for the community. Since Akutan is classified as a coastal community, it is susceptible to shoreline |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.<br>Riverine land destabilization isn't identified as a concern for the community.<br>At the beginning of 2026, PND Engineers began the "Akutan Beach Erosion Mitigation Project" in the community. This Project consists of collection and analysis of existing data, a site visit, community meeting, shoreline mitigation measures assessment, and hydrodynamic modelling (PND Engineers 2026). |
| Flood | 3- Likely | 4- Catastrophic | The Planning Team reports that low-lying waterfront areas in Akutan have experienced coastal flooding, storm surge, and high tides.<br>The Planning Team reports that low-lying waterfront areas are most impacted by storm events, including infrastructure such as the Akutan Library and residential homes. |
| Ground Failure/ Landslide | 2- Possible | 4- Catastrophic | Akutan is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity. |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of Akutan is susceptible to severe weather events and impacts. The Planning Team reports experiencing coastal storms, dense fog, and high winds. |
| Tsunami | 3- Likely | 4- Catastrophic | Akutan is located on Fox Island. Most infrastructure is at an elevation of approximately 98 feet above sea level. According to FEMA's National Risk Index, the tsunami risk for Akutan is Relatively Moderate. According to the State of Alaska DHS&EM, Akutan has local tsunami potential and a medium risk of distant tsunami potential.<br>Formal tsunami inundation mapping for Akutan was completed in 2015. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of Akutan is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Akutan. |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | Volcanic ashfall is the primary volcanic hazard that may impact Akutan.<br>Akutan is located in relatively close proximity to Mount Akutan, which has produced large eruptions over the past century, and has averaged an eruption approximately every four years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, Akutan has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community. The notable exception occurred in 1962, when an eruption from Mount Akutan impacted the community with a thick layer of ash covering the community boardwalk that required it to be swept (AVO 2026). |
| Wildland Fire | 2- Possible | 3- Critical | Akutan has a relatively low wildfire risk compared with many areas of mainland Alaska because of its cool, wet maritime climate and limited forested vegetation. However, wildfires can occur in grass, tundra, brush, and other available fuels, particularly during periods of dry weather, warm temperatures, and strong winds.<br>The Planning Team is concerned about the potential for a fire to spread and become dangerous given the proximity of houses in the community. In the past, wildfires have largely resulted from manmade influences (debris burning/ incineration, in particular). During summer seasons, however, these wildfires present a severe hazard to houses. Since houses are so close together, made from wood, and connected via wooden boardwalk, the risk to human life and property damage is high. |
| Dam Failure | 2- Possible | 3- Critical | There is one (1) Significant Hazard Potential Dam in Akutan. The Akutan Hydro Dam, also known as the Town Creek Hydroelectric Dam, is owned by the City of Akutan.<br>There has not been a history of dam failures from the Akutan Hydro Dam.<br>Formal dam failure inundation mapping is not available for the Akutan Hydro Dam. |
| Invasive Species | Did not profile this hazard | | |

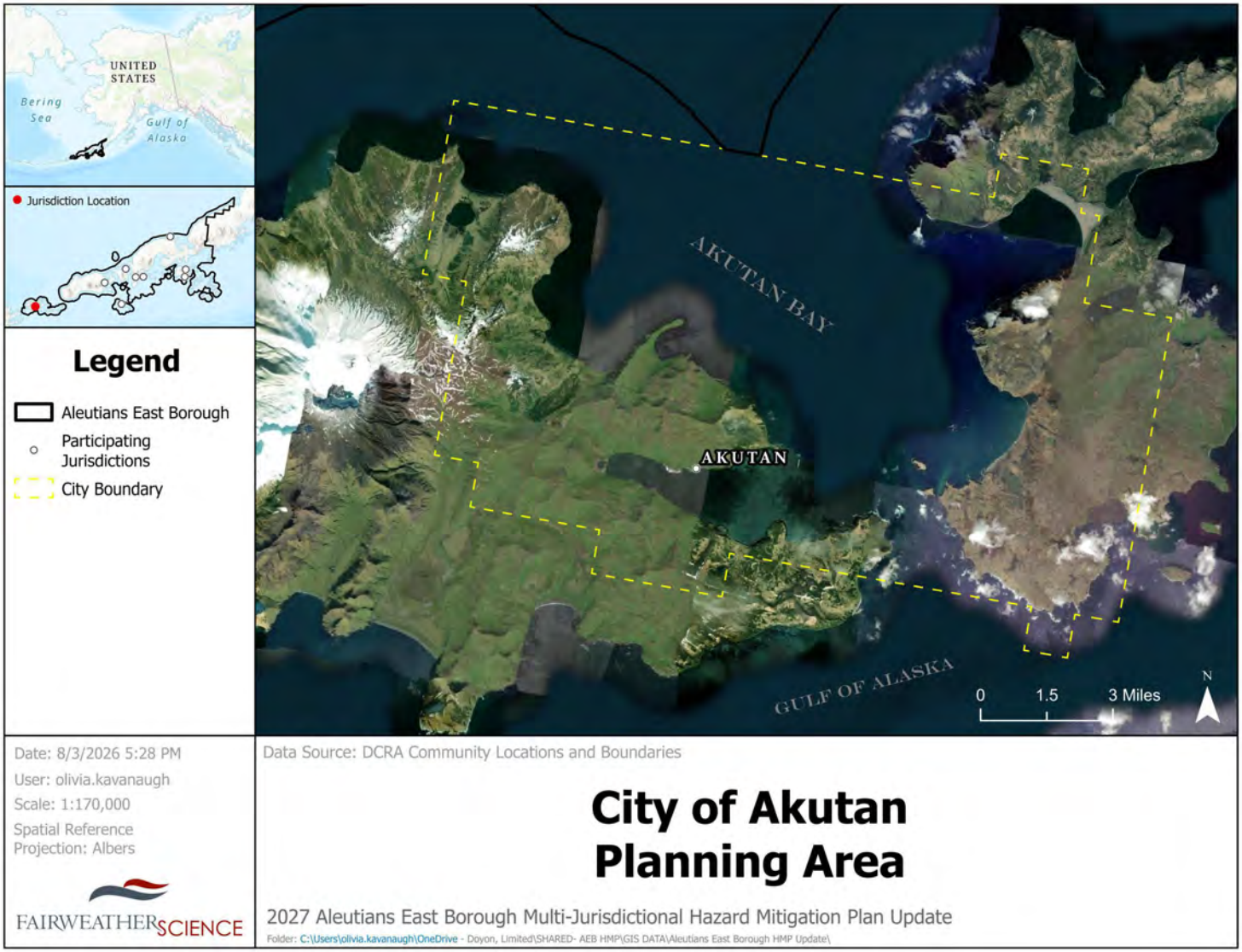



**Figure B-1- City of Akutan Planning Area**

#### B.4.1.1 Changes in the Cryosphere- Sea Ice

The City of Akutan Planning Team did not select this hazard to be profiled in the MJHMP Update.

### B.4.1.2 Changes in the Cryosphere- Snow Avalanche

#### B.4.1.2.1 Location

The Planning Team reports that snow avalanches sometimes occur in the winter in a location against the hillside where the houses are located.

As avalanche hazard areas are not well defined in the community and detailed terrain data, such as LiDAR, were not available, ArcGIS Pro basemaps, including satellite imagery, topographic maps, and terrain data, were used to identify mountainous areas, elevation, and observable slope characteristics.

Potential avalanche hazard areas were manually delineated based on these features (Figure B-2). Where available, photographs of the surrounding geography were also reviewed to confirm the presence of steep slopes and other terrain characteristics indicative of potential avalanche hazard.

***This assessment is intended to identify potential areas of avalanche hazard at a planning level. It is not a substitute for site-specific avalanche hazard mapping, geotechnical investigations, or detailed evaluation of local topography, snow conditions, and site-specific conditions. Areas identified through this assessment should be considered preliminary and should be subject to further investigation where development or other activities may be exposed to avalanche hazards.***

A preliminary volcano hazard assessment for Akutan Volcano includes the approximate runout limit of debris avalanche produced by failure of the caldera rim (Figure B-3).

The runout limit for an avalanche on Akutan Volcano does not threaten infrastructure or property in Akutan (USGS, 1998).

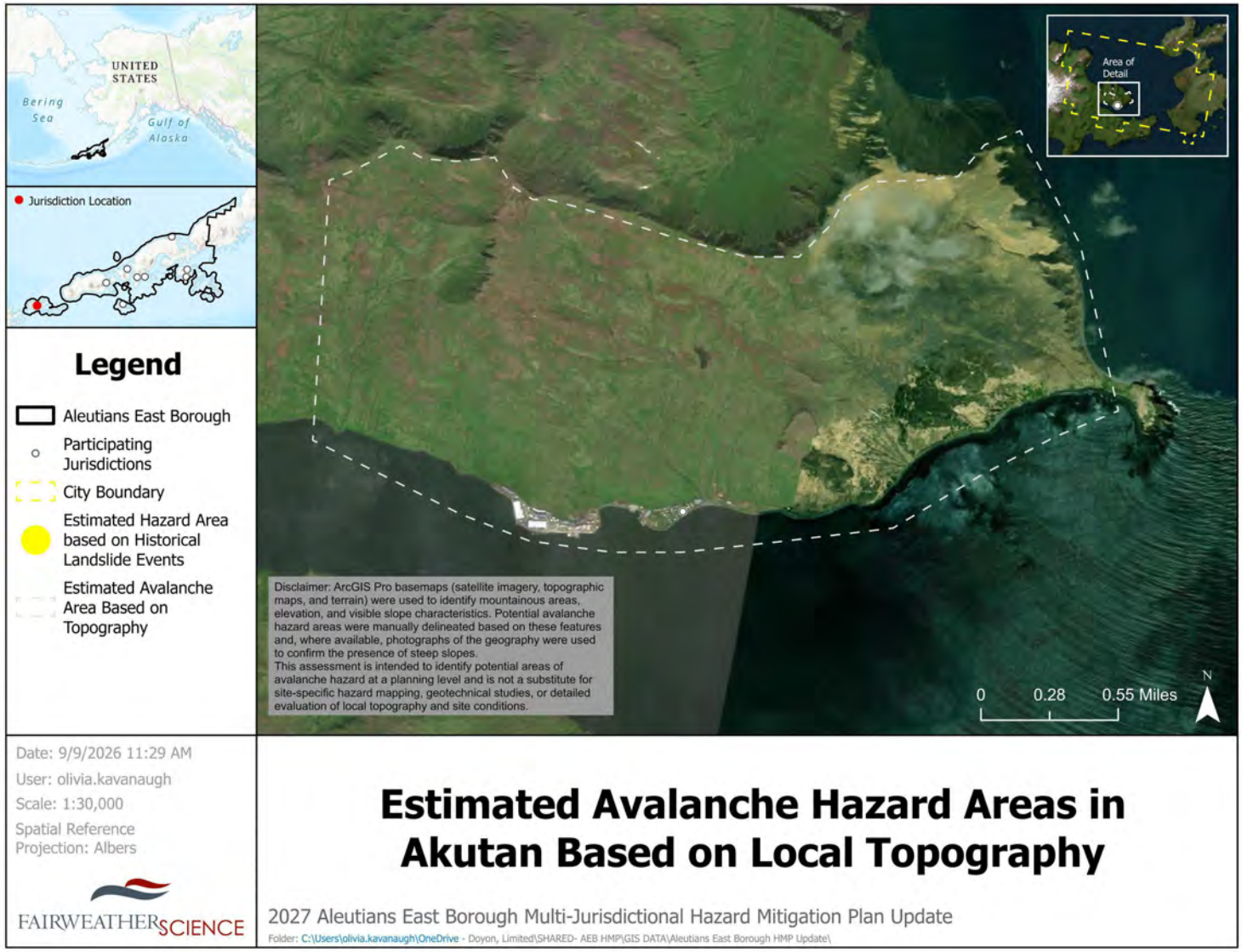
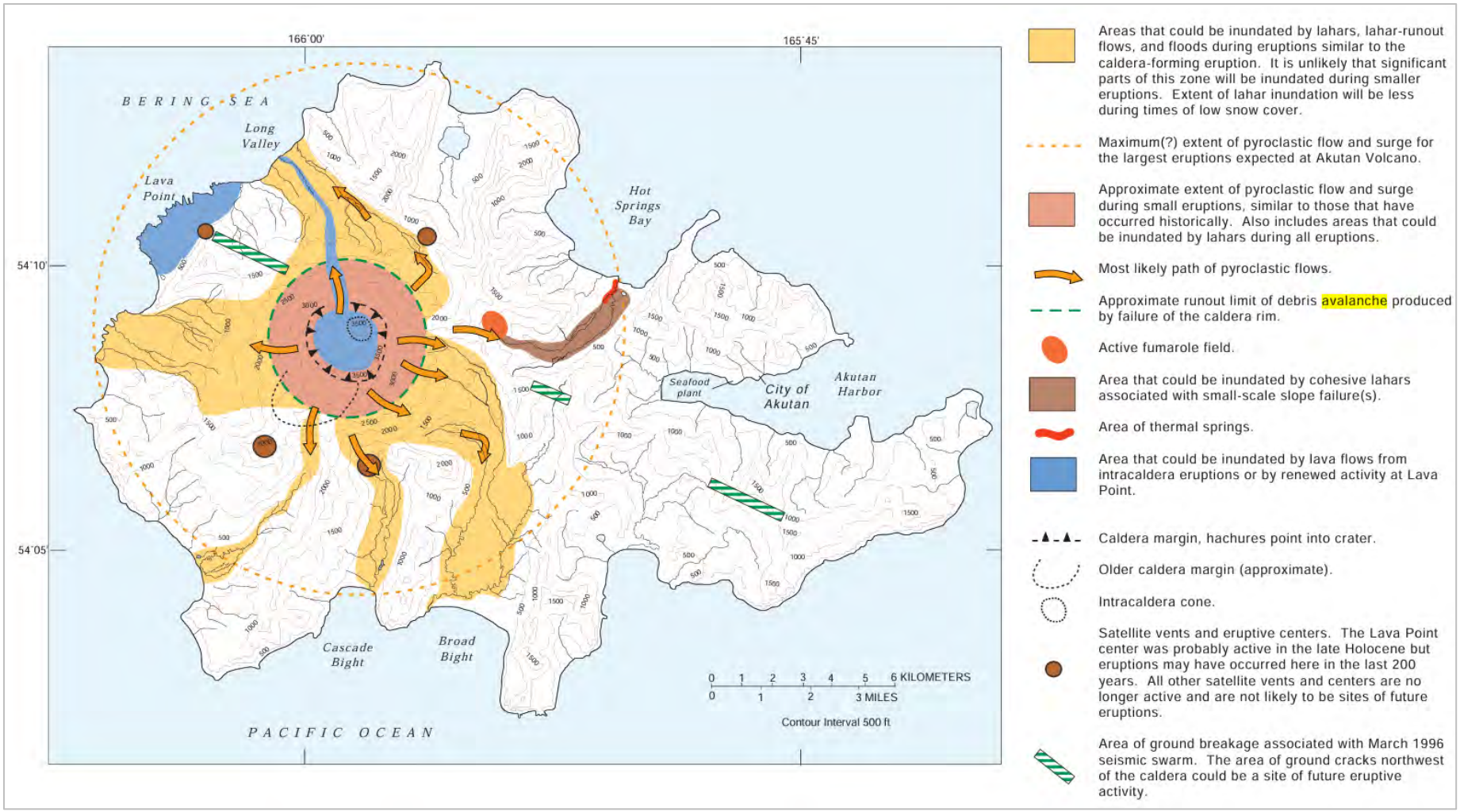



**Figure B-2- Estimated Avalanche Hazard Areas in Akutan Based on Local Topography**




Source: USGS, 1998

**Figure B-3- Preliminary Volcano-Avalanche Hazard Assessment for Akutan Volcano**

#### B.4.1.2.2 History

The Planning Team reports that an avalanche occurred on March 20th, 2012, on a hillside, impacting houses below. This avalanche "completely covered the backside of two houses. They had to shovel out the windows so the pressure wouldn't break the windows."

This avalanche was reported in the Local Environmental Observer Network (LEO). The Planning Team also reports that Akutan historically received 10–12-foot snow drifts. These large snow drifts are much less common now.



Source: Photo courtesy of Bruce Wright for the LEO Network

**Figure B-4- Avalanche in Akutan, March 3, 2012 (1 of 2)**



Source: Photo courtesy of Bruce Wright for the LEO Network

**Figure B-5- Avalanche in Akutan, March 3, 2012 (2 of 2)**

#### B.4.1.2.3 Extent (Magnitude and Severity)

The snow avalanche in March 2012 resulted in 6+ feet of snow. The Planning Team also reports that Akutan historically received 10–12-foot snow drifts. These large snow drifts are much less common now.

Based on the extent of past snow avalanche events and the criteria identified in Table 5 of the Base Plan, the extent of a snow avalanche event in Akutan is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### B.4.1.2.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The Planning Team did not report previous impacts to geography/land from snow avalanches in Akutan. |
| Infrastructure | The Planning Team reported that two houses were partially buried by a snow avalanche on March 3rd, 2012. |
| People | The Planning Team reported that when two houses were partially buried by a snow avalanche on March 3rd, 2012, people needed to shovel out the snow so that the pressure would not break the windows. There are no specific reports of personal injury or death due to snow avalanches in Akutan. |

| | Description of Previous Impacts |
|---|---|
| Utilities | The Planning Team did not report previous impacts to utilities from snow avalanches in Akutan. |
| Transportation | The Planning Team did not report previous impacts to transportation from snow avalanches in Akutan. |
| Economy | The Planning Team did not report previous impacts to the economy from snow avalanches in Akutan. |
| Subsistence Resources | The Planning Team did not report previous impacts to subsistence resources from snow avalanches in Akutan. |

#### B.4.1.2.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Akutan will experience a snow avalanche event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### B.4.1.2.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of snow avalanche hazards in Alaska. |
| Location | It is possible future climate conditions will influence the location of snow avalanche hazards in Alaska. As warmer, wetter winters become more prevalent, heavy-snow avalanches may occur on different slopes that have not historically experienced avalanches. |
| Extent | Future climate conditions are likely to influence the magnitude and severity of avalanches. Avalanche activity is determined by several factors, including snowpack type, internal liquid volume, air temperature, precipitation, elevation, slope, ground cover, etc. An increase in liquid content within snowpack, from increased December-March air temperature and January-February increased precipitation, may lead to greater occurrence of wet snow avalanches, especially in late winter/early spring (Ballesteros-Canovas et al. 2018). |
| Impact | Future climate conditions are likely to influence the impact of avalanches. As snowpack experiences greater liquid volume, avalanche risk will increase (Ballesteros-Canovas et al. 2018). As snowpack retreats to higher elevations due to reduced snowpack and quickened melt, the impacted area will also shift upwards. Impacts in this scenario will likely be due to loss of water supply, affecting culture, wildlife resources, and tourism (IPCC 2018). Infrastructure in avalanche hazard zones may also be impacted by an increase in frequency and extent of wet snow avalanches. Damage to structures may vary depending on the impact pressure of the avalanches. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of future avalanche events in Akutan. Some studies suggest that a warming climate may increase avalanche risk due to changes in snow accumulation and moisture content, as well as loss of snowpack stability because of changing air temperature (DGGS 2023d). Ballesteros-Canovas et al. (2018) predicts an increase in avalanche activity in the 2nd half of the 21st century; largely wet-snow avalanches due to increased air temperature and precipitation. |

| Description of Future Conditions | |
|---|---|
| Population Patterns | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in Akutan. However, this is jurisdiction-dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in construction moving outside of avalanche zones. Due to the cost and difficulty of building in the Aleutian Islands, it is possible that if a home is damaged by an avalanche that the residents may move out of the community completely. |
| Land Use Development | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in Akutan. However, this is jurisdiction-dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in land use which promotes development outside of possible avalanche slide paths. |
| Subsistence Resources | Future climate conditions are not anticipated to influence subsistence resources as they relate to avalanche hazards. |

### B.4.1.3 Dam Failure

There is one (1) Significant Hazard Potential Dam in Akutan. The Akutan Hydro (Town Creek Hydroelectric) Dam has a NID ID of #AK00264.

#### B.4.1.3.1 Location

The Akutan Hydro (Town Creek Hydroelectric) is located north of the population center of Akutan, and uphill from the coastline approximately 760 feet. The dam is owned by the City of Akutan.

| NID ID #AK00264 Akutan Hydro Dam (Town Creek Hydroelectric Dam) | |
|---|---|
| Hazard Classification | Significant |
| Owner | City of Akutan |
| Year Built | 1993 |
| Dam Type | Earth |
| Dam Purpose | Hydroelectric |
| Length x Height | 200 ft x 21 ft |
| Drainage Area | Unknown |
| Inspection Frequency | The most recent inspection was June 20, 2018. Inspection frequency is every 3 years. |
| Downstream Description | The outflow of the dam creates a small creek, which flows downstream until reaching Akutan Harbor. The creek terminates after descending 760 feet of elevation over 0.75 miles. There is an access trail that parallels the creek, and multiple roads and infrastructure along the coastline, on both sides of the creek mouth. |
| Downstream Area | The downstream area consists of steep, sparsely vegetated land. There is no infrastructure besides an access trail until the creek reaches the coast, where there are numerous structures to the east and the west of the creek mouth. |
| Downstream Dams | There are no dams immediately downstream of Akutan Hydro Dam. |
| Downstream Bridges | There are two (2) bridges downstream of Akutan Hydro Dam. One allows the access trail to pass over the top of the dam. The second bridge is on the coastline, allowing the Boardwalk Road to cross over the creek. |
| Reservoir Area | Akutan Hydro Dam (Town Creek Hydroelectric Dam) has a maximum capacity of 20 acre feet and a surface area of 1.4 acres. The reservoir is approximately 460 feet long and 210 feet wide. |
| Downstream Development | The Akutan Hydro Dam outflow does not intersect any development (other than the access route) until the creek reaches the coastline. On the coastline, there is 21 structures within .25 miles of the Creek mouth – including the Trident Seafoods Plant. |
| General findings of the 2018 inspection | The condition assessment of the 2018 inspection found the Akutan Hydro Dam in Fair condition. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. Potential inundation of the access trail, permanent structures in the inundation area can happen. Due to the steep slope of the outflow, land destabilization could be anticipated during a dam break. |

| NID ID #AK00264 Akutan Hydro Dam (Town Creek Hydroelectric Dam) | |
|---|---|
| Recommended Hazard Potential Classification | The US Army Corps of Engineers, through the National Inventory of Dams, have classified this dam as Significant Hazard Potential. Due to the downstream development and potential loss of life, this recommendation is accurate and justified based on current classification guidelines. |

#### B.4.1.3.2 History

There is no history of dam failure in Akutan related to Akutan Hydro (Town Creek Hydroelectric) Dam.

#### B.4.1.3.3 Extent (Magnitude and Severity)

**Akutan Hydro (Town Creek Hydroelectric) Dam**

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

Figure B-6 displays the potential inundation from an Akutan Hydro (Town Creek Hydroelectric) Dam failure.

Based on the extent of past dam failure events and the criteria identified in Table 5 of the Base Plan, the extent of dam failure events in Akutan is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

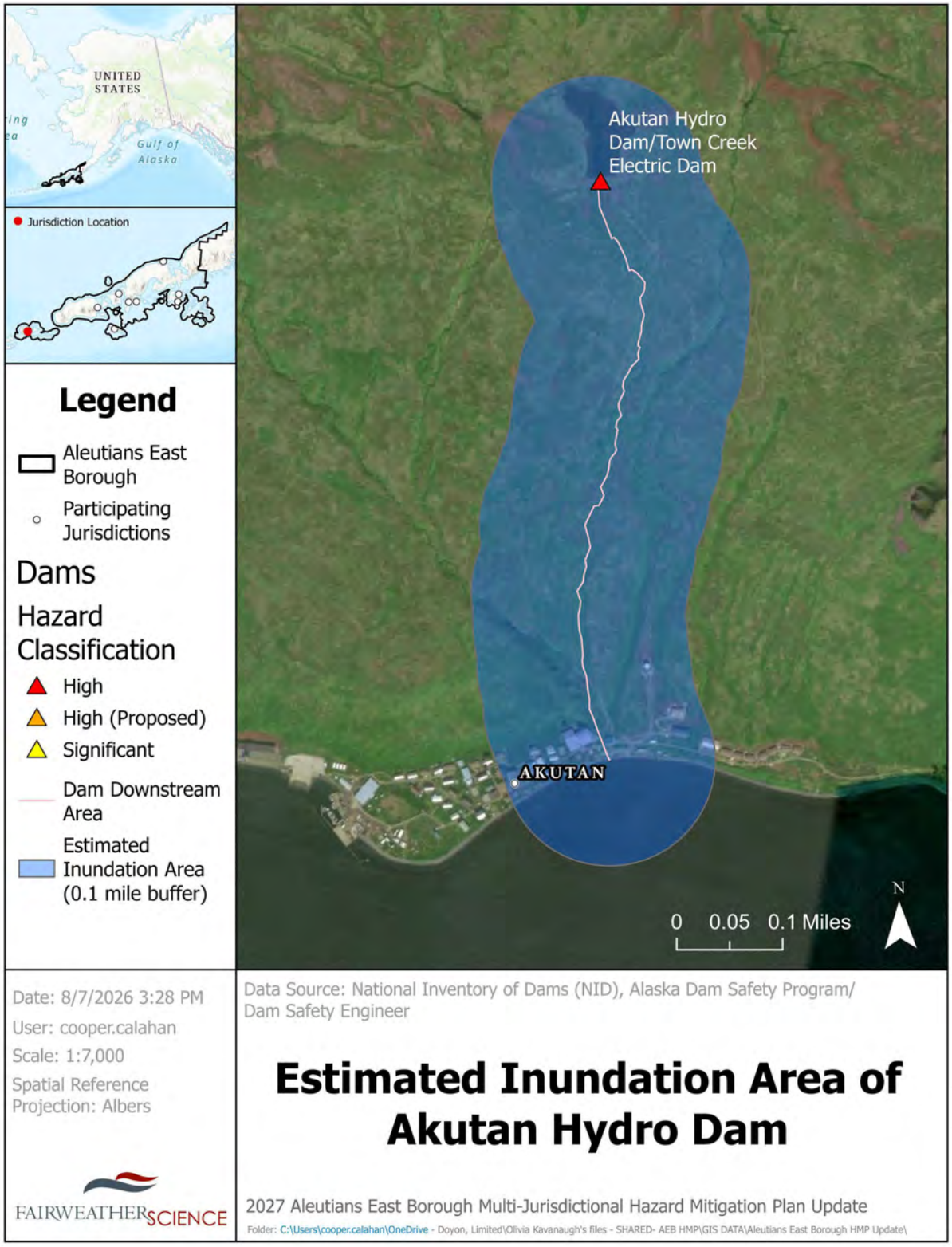



**Figure B-6 - Potential Dam Inundation of Akutan Hydro (Town Creek Hydroelectric) Dam**

#### B.4.1.3.4 Impact

| Description of Impacts | |
|---|---|
| Geography/Land | There are no recorded impacts on the geography or land in Akutan due to dam failure. A dam failure could change the course of the downstream outflow creek and make the surrounding land more prone to ground failure or land destabilization. |
| Infrastructure | There are no recorded impacts on infrastructure due to dam failure in Akutan. Based on our assessment methodology of dam failure inundation zones, critical facilities downstream of the dam and within 0.1 miles of the outflow route could be inundated with flood water from a dam failure in Akutan.<br><br>Critical facilities at risk of dam inundation include the museum/library building, City Administration building, Day Care facility, Recreation Center, VPSO housing and jail, school, City Hall, Equipment warehouse, Water Storage Tank, Hydro Generator, Water Treatment Plant, Incinerator Building, and the Akutan Hydro Dam. |
| People | There have been no recorded impacts of injuries or fatalities due to dam failure in Akutan. Injuries due to swift water and/or drowning are possible during a future dam failure. |
| Utilities | There have been no recorded utility disruptions due to dam failure in Akutan. |
| Transportation | There have been no recorded impacts on transportations systems due to dam failure. In the event of a potential dam failure, no impact on air transportation is expected. Overland/trail travel up to the dam site may be impacted during a dam failure. The boardwalk may also be impacted by dam failure in Akutan. |
| Economy | There have been no economic impacts due to dam failure in Akutan. |
| Subsistence Resources | No specific reports of subsistence resources impacts due to dam failure have been reported in Akutan. |

#### B.4.1.3.5 Probability of Future Events

According to the Alaska Dam Safety Program:

> *Dam owners conduct routine monitoring and inspection of dams within the state on the previously identified schedule, with priority placed on those dams which pose the greatest potential threat. However, to fully determine the probability of a future event, a full engineering inspection would need to be completed on each dam, something beyond the scope of this program. The majority of these more thorough inspections are conducted by an independent agency hired by the dam owner, FERC, or the USACE.*
>
> *Dams undergoing repair and/or reconstruction are required to be designed to pass at least the 1%-annual-chance rainfall event with one foot of freeboard. The most critical and hazardous dams are required to meet a spillway design standard much higher than passing the runoff from a 1%-annual-chance rainfall event. Although not all the dams have been shown to withstand the 1%-annual-chance rainfall event, most of the dams meet this standard due to original design requirements or recent spillway upgrades.*

The probability for dam failure reduces when the dam is properly maintained and receives a “Satisfactory” condition rating.

Based on the criteria listed in Table 6 of the Base Plan and the most recent dam condition assessments, it is **Possible** that Akutan will experience a dam failure event in the calendar year; there is a less than 10% annual

probability of occurring, where injuries and/or illnesses could result in temporary to permanent disability; with potential for critical facilities to be shut down for more than a week, and 10% of property would be severely damaged. Failure depends on loading conditions (precipitation, seismic, deferred maintenance, vandalism, etc.).

However, the State of Alaska Dam Safety Engineer warned of "condition creep", where observational assessments of AEB dams have rated dams more poorly than their most recent available condition rating. If dams in AEB continue to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### B.4.1.3.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in Akutan. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in Akutan. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in Akutan. A potential outcome of changing climate in Alaska is an increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in Akutan. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in Akutan. Increased precipitation and frequency of severe weather events could contribute to more stress on the dam in Akutan. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in Akutan as residents may relocate in and out of potential future inundation areas. Residents of Akutan may also relocate out of Akutan Area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in Akutan. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted in inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in Akutan.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes.

### B.4.1.4 Earthquake

#### B.4.1.4.1 Location

All of Akutan is susceptible to earthquakes and their impacts because it sits directly above the Aleutian subduction zone. Akutan lies along the Alaska-Aleutian Megathrust, which is an active fault line spanning the length of the Aleutian chain where the Pacific Plate subducts into the mantle beneath the North American Plate. This seismically active region also contains smaller faults capable of producing earthquakes.

According to the 2023 State of Alaska HMP, Akutan is located in an area with the potential of Severe perceived shaking from earthquakes (34.0 – 65.0%g) (Figure B-7). Perceived shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. This map focuses on the actual variations in shaking intensity across a region as felt by people and structures.

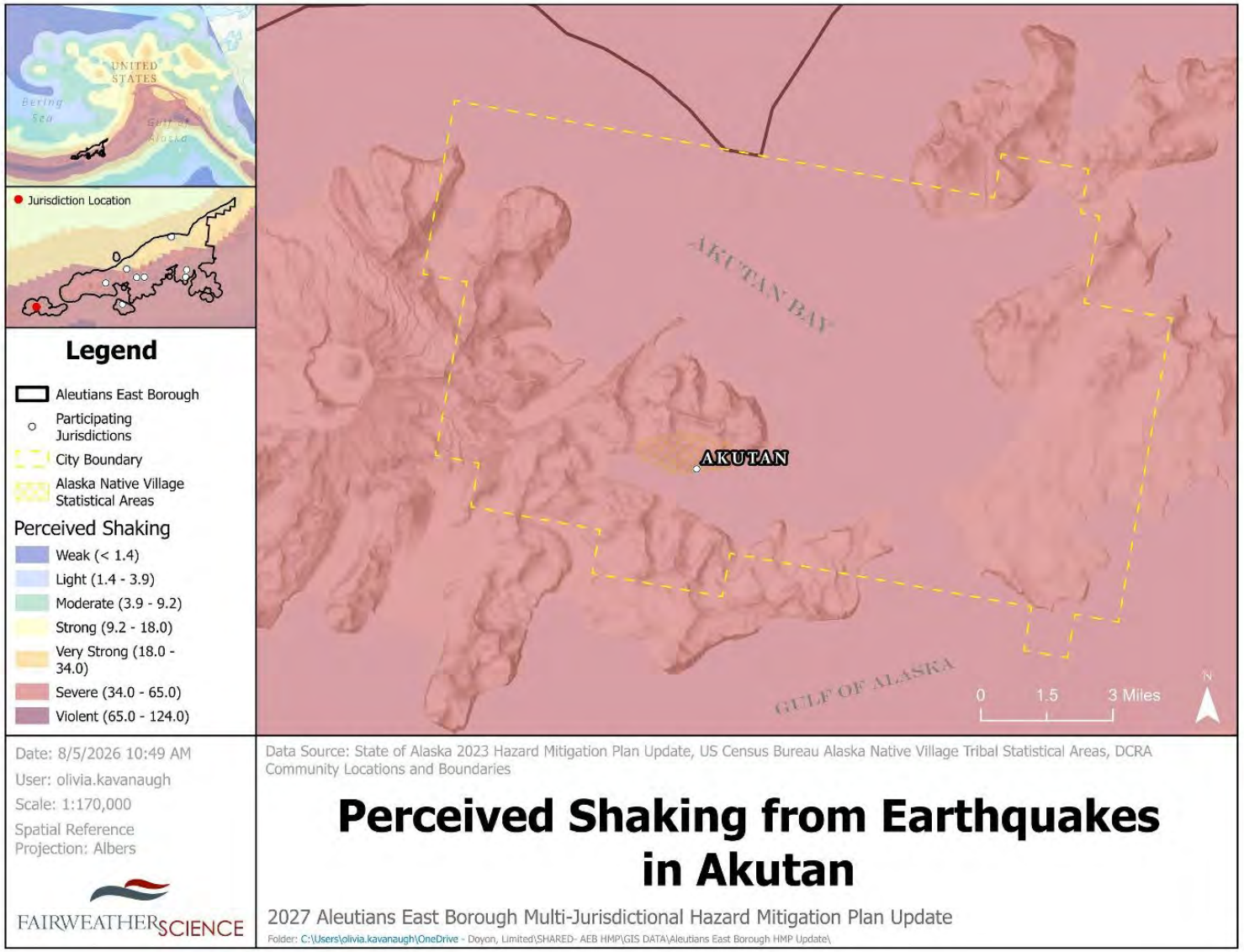



**Figure B-7 - Perceived Shaking from Earthquakes in Akutan**

#### B.4.1.4.2 History

Thousands of earthquakes occur each year along the Aleutian chain. Strong shaking has occurred historically in Akutan and can damage infrastructure and trigger tsunamis.

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

Please Table 11 in the Base Plan for a list of historical earthquakes M6.0 and greater within the AEB Boundary.

#### B.4.1.4.3 Extent (Magnitude and Severity)

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding Akutan experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Based on the extent of past earthquake events and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in Akutan is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### B.4.1.4.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | The Planning Team stated that they heard of landslides across the Bay related to a series of earthquakes around 1997.<br>Aside from this, there have been no recorded earthquake impacts on the geography or land in Akutan. An earthquake has the potential to trigger landslides, open cracks in the earth, and change the shoreline. |
| Infrastructure | While shaking has been perceived in Akutan, no reports of damage to buildings have been reported. A large earthquake could crack foundations and roadways and flatten buildings and other structures in the case of extremely severe earthquakes. |
| People | The Planning Team reported that some people were evacuated during a series of earthquakes around the year 1997.<br>No injuries or fatalities due to earthquakes have been reported in Akutan. Earthquakes could cause injury or death by toppling structures with people inside, or debris falling onto individuals. |
| Utilities | The Planning Team reported that there was minor water line damage outside of residences as a result of a series of earthquakes around the year 1997.<br>There are no other recorded impacts on utility systems due to past earthquakes in Akutan. Earthquakes can damage sewer and water lines, and down telephone poles. |
| Transportation | There are no recorded transportation system impacts due to earthquakes in Akutan. In the future, earthquakes could damage roadways or airport runways, limit road and air travel, or cause a tsunami that could damage boat harbors and other water travel infrastructure. |
| Economy | There are no recorded economic impacts due to earthquakes in Akutan. |
| Subsistence Resources | There are no recorded earthquake caused impacts on subsistence resources. |

#### B.4.1.4.5 Probability of Future Events

Seismic activity is a frequent occurrence in Akutan. A M2.9 earthquake was detected 56 miles SE of Akutan on August 4th, 2026 at a depth of 5.6 miles (UAF Alaska Earthquake Center, 2026).

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Akutan will experience an earthquake event of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### B.4.1.4.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The characteristics and nature of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Location | The location of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Extent | The extent of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Impact | The impact of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Probability of Future Events | The probability of future earthquake events is not affected by changing climate conditions and is not expected to change on human timescales (Alaska DHS&EM 2023). |
| Population Patterns | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, population patterns in Akutan are not expected to be affected. |
| Land Use Development | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, land use development in Akutan is not expected to be affected. |
| Subsistence Resources | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, subsistence resources in Akutan are not expected to be affected. |

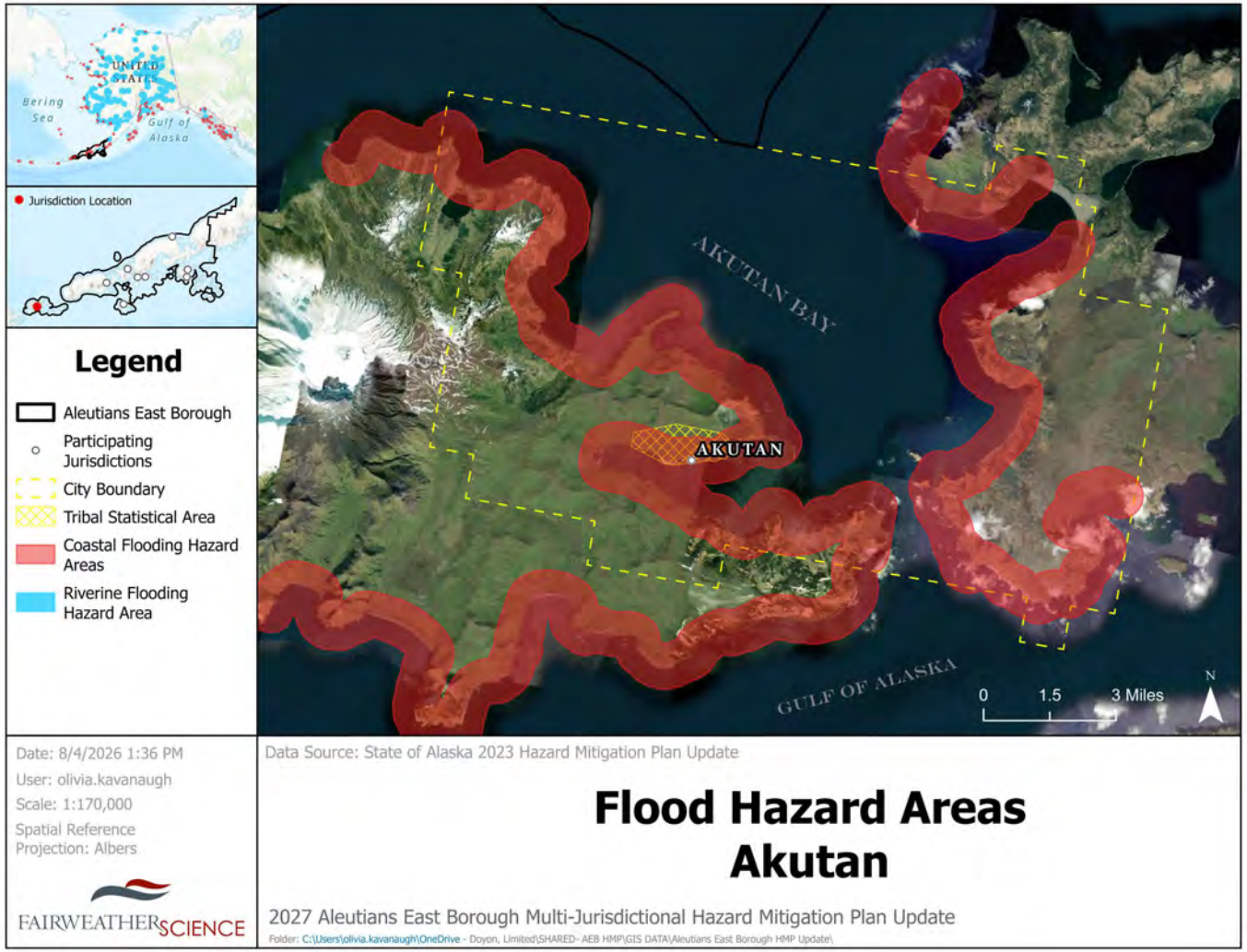
#### B.4.1.5 Flood

The City of Akutan Planning Team reports experiencing flood events, including storm surge and high tide (king tide) events.

##### B.4.1.5.1 Location

According to the 2023 State HMP, Akutan is within the identified Coastal Flooding Hazard Area (Figure B-8). The State of Alaska identifies coastal flooding hazard areas of 0.5 miles from the coastline (DHS&EM 2023).

The City of Akutan Planning Team reports that low-lying waterfront areas have experienced coastal flooding, storm surge, and high tides.




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or under estimate flooding extent in the geography.

**Figure B-8- Akutan Flood Hazard Areas**

#### B.4.1.5.2 History

The National Weather Service records major historical severe weather events, including flooding. Within this list for AEB communities, only one event description includes flooding-related impacts for Akutan.

On January 6th, 2024, there was a high wind and rainfall event, with winds gusting 102 mph. The storm caused some flood damage, with a boat inundating due to the weight of the rain and snow and a breakwater being damaged (NWS, 2026).

#### B.4.1.5.3 Extent (Magnitude and Severity)

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest (number 63) has the lowest vulnerability.

***Of these 187 communities, Akutan received a flood threat ranking of 59 out of 63 (Denali Commission, 2019).***

While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking.

Past flood events in Akutan have resulted in several inches of inundation and has caused washouts near the City Dock. The Planning Team reported that extended periods of rain can result in approximately 2 inches of water on the roadways, with streams flooding and washing out the road below the school.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding in the Akutan is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### B.4.1.5.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | High tides combined with storms can increase coastal flooding and wave impacts in low-lying waterfront areas in Akutan. The Planning Team did not report specific previous impacts to geography/land from flooding in Akutan. |
| Infrastructure | The Planning Team reported that wave action, coastal flooding, and high tides threaten waterfront infrastructure, such as the Akutan Library and residential homes in Akutan. Coastal flooding has impacted harbor and shoreline facilities. The Planning Team did not report additional specific previous flood impacts to infrastructure in Akutan. |
| People | No specific reports of personal injury or death have been reported due to flooding in Akutan. |
| Utilities | No specific reports of utility outages or failures due to flooding have been reported in Akutan. |
| Transportation | Storm surge has impacted the area by the City Dock in the wintertime. Coastal flooding from storms and high tides periodically affects the harbor, disrupting marine transit. Flooding due to rainfall can wash out roadways, such as the road below the school. |
| Economy | No specific impacts to the economy have been reported due to flooding in Akutan. |
| Subsistence Resources | No specific reports of transportation impacts due to flooding have been reported in Akutan. |

#### B.4.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Akutan will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### B.4.1.5.6 Future Climate Conditions

The City of Akutan Planning Team reports that sea level rise, increased storm intensity, and changing precipitation patterns may increase future coastal and infrastructure risks.

| Description of Future Conditions | |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in Akutan as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in Akutan is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in Akutan, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in Akutan. |
| Probability of Future Events | The probability of future flooding events in Akutan is likely to increase due to increasing precipitation and heavy rainfall events.<br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021).<br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in Akutan, however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |

| Description of Future Conditions | |
|---|---|
| Population Patterns | It is possible that future flood events will cause changes in population patterns in Akutan as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development in Akutan through the implementation of zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### B.4.1.6 Ground Failure/Landslide

#### B.4.1.6.1 Location

Akutan is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity.

Many landslide paths coincide with avalanche paths, especially at higher elevations. Unmapped areas within the Borough remain to be studied for landslide hazards and will be included in future updates of this plan as resources become available to evaluate those areas for landslide hazards.

As landslide hazard areas are not well defined in the community and detailed terrain data, such as LiDAR, were not available, ArcGIS Pro basemaps, including satellite imagery, topographic maps, and terrain data, were used to identify mountainous areas, elevation, and observable slope characteristics.

Potential landslide hazard areas were manually delineated based on these features (Figure B-10). Where available, photographs of the surrounding geography were also reviewed to confirm the presence of steep slopes and other terrain characteristics indicative of potential landslide hazard.

***This assessment is intended to identify potential areas of landslide hazard at a planning level. It is not a substitute for site-specific landslide hazard mapping, geotechnical investigations, or detailed evaluation of local topography, and site-specific conditions. Areas identified through this assessment should be considered preliminary and should be subject to further investigation where development or other activities may be exposed to landslide hazards.***

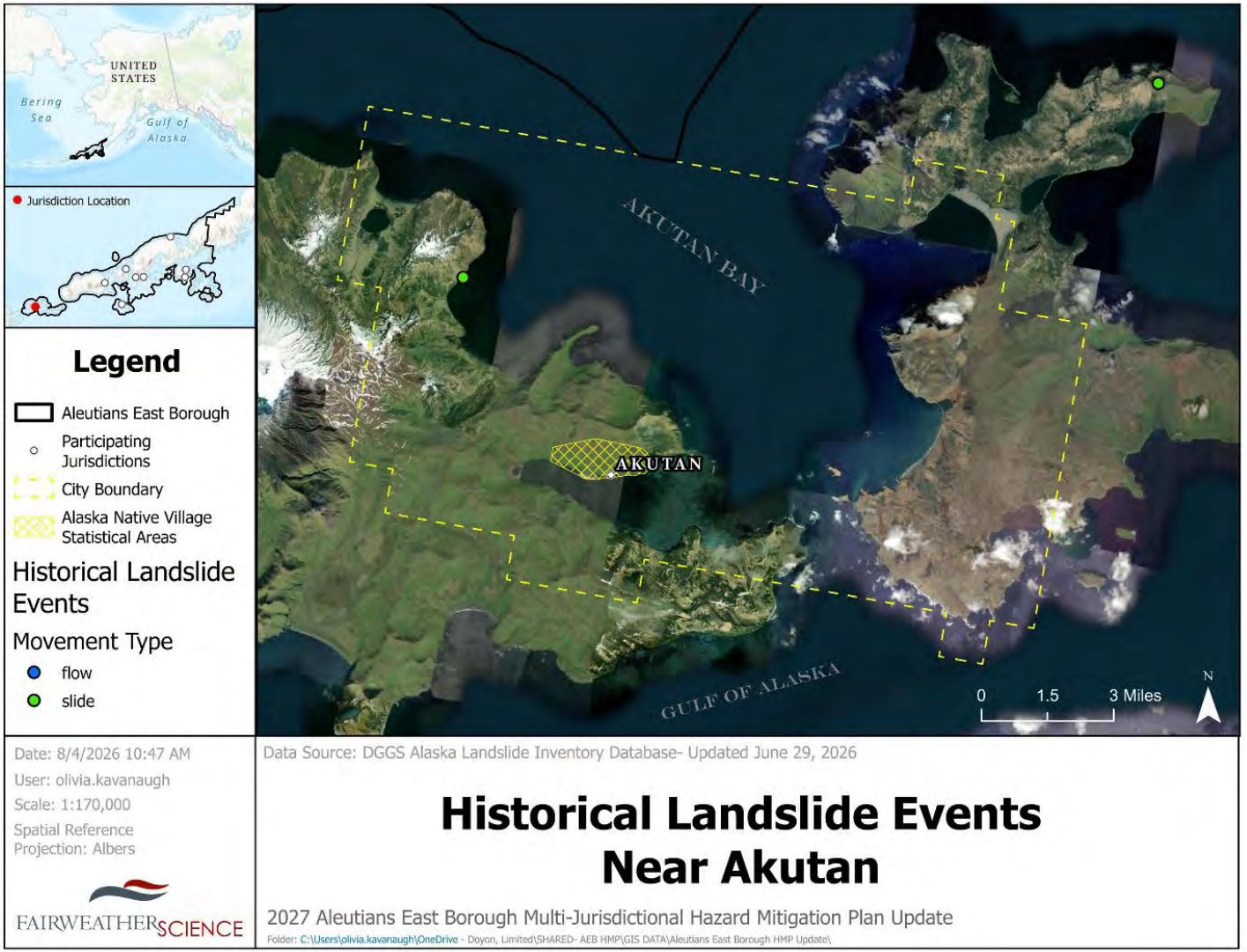



**Figure B-9- Historical Landslide Events in Akutan**

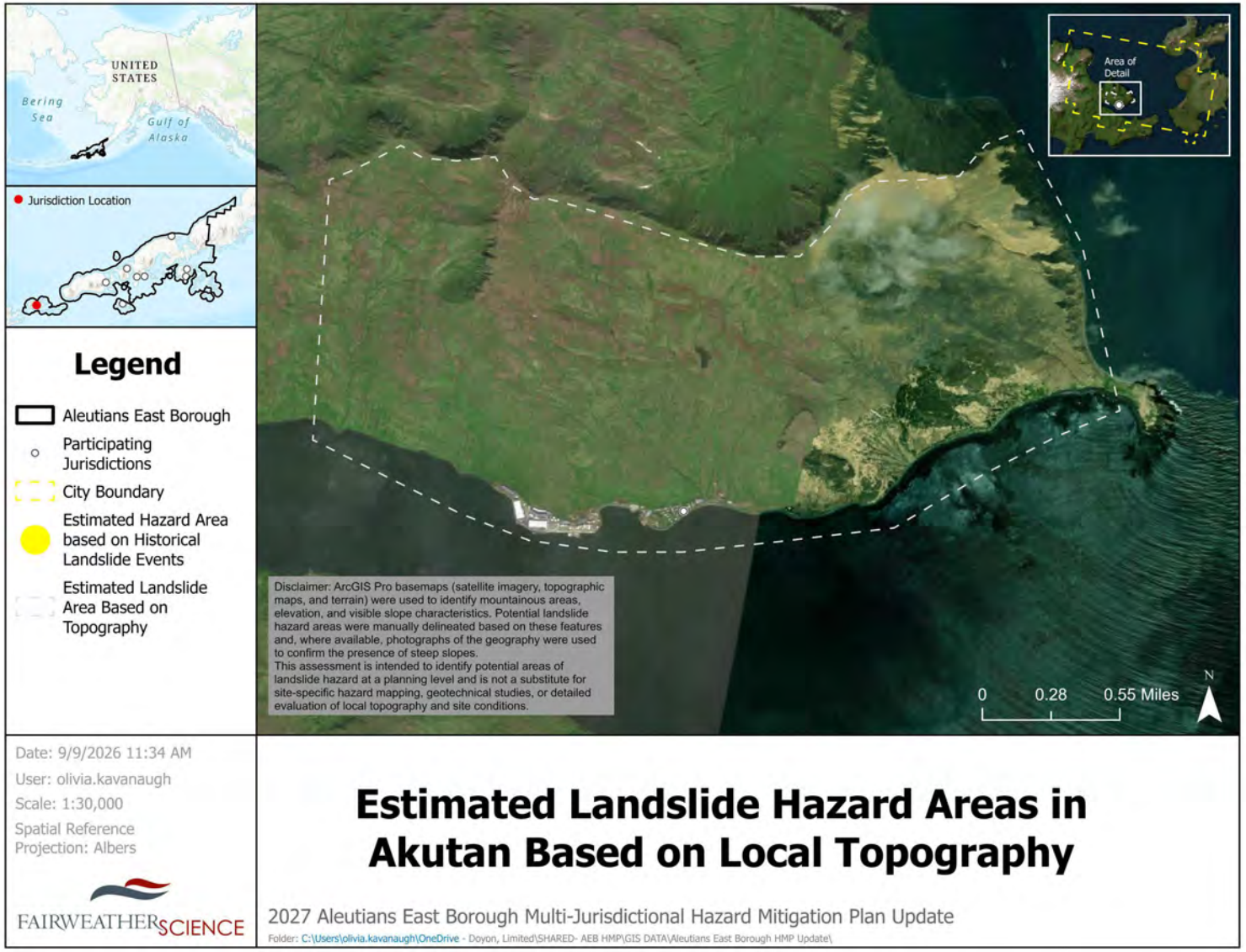



**Figure B-10- Estimated Landslide Hazard Areas in Akutan Based on Local Topography**

#### B.4.1.6.2 History

There has been one (1) recorded subaerial landslide event in Akutan. The Alaska Landslide Inventory Database does not provide any additional information other than it was classified as a landslide and not a debris flow.

The April 1st, 1946 earthquake near Unimak Island (approximately 42 m east of Akutan, 35 miles west of Cold Bay and 45 miles east of King Cove) created a tsunami wave that reached all the way to Antarctica. For years, speculation existed that the large tsunami was aided by a submarine landslide due to the disproportionate waves created by the earthquake. In 1996, the USGS GLORIA discovered numerous slope failures (historic submarine landslides) along the eastern Aleutian Shelf. An exceptionally large failure was found at the location of the now named Ugamak Slide (Fryer, Watts, Patson 2004). The Ugamak Slide consists of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

If the Ugamak Slide did indeed occur on April 1st, 1946, it is likely that much of the seismic motion, especially at longer periods, was from the slide itself. A tectonic shock – a shallow subduction earthquake – was probably the trigger but differentiating it from the rest of the motion may prove impossible. The evidence for a landslide source to the 1946 tsunami is substantial (Fryer, Watts, Patson 2004).

#### B.4.1.6.3 Extent (Magnitude and Severity)

Damage from ground failure or landslides ranges from minor with minimal repairs required to a massive economic impact with the possible destruction of critical community infrastructure and potential loss of human life.

Subaerial landslides on sloped terrain in Akutan pose a threat to critical facilities or human life. Subaerial landslides near bodies of water also pose a threat to critical facilities or human life in the Planning Area as they may trigger a tsunami or seiche.

A landslide (both submarine and subaerial) has the ability to trigger a tsunami. Due Akutan's location between the Bering Sea and the Pacific Ocean, and exposure to the open ocean, a submarine landslide-induced tsunami affecting the Planning Area in the future is a possibility. In the past, a submarine landslide created secondary hazards (tsunamis), that have impacted Akutan.

Based on the Alaska Landslide Inventory Database, it can be estimated that the historical landslides recorded in Akutan range in width of less than 100 feet to over 500 feet.

The largest discovered underwater landslide deposit in the Aleutians East Borough is the Ugamak Submarine Slide. The Ugamak Submarine Slide consisted of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

Based on the extent of past landslide events and the criteria identified in Table 5 in the Base Plan, the extent of landslide events in Akutan is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### B.4.1.6.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | One recorded landslide has impacted Akutan; however the landslide did not occur near the population center of Akutan and it did not affect any critical facilities.<br>Future landslides could damage steep hillsides, making them more prone to land destabilization, avalanches, and further landslides. |
| Infrastructure | There have not been any recorded impact on infrastructure in Akutan.<br>Landslides can move structures off their foundation, damage walls and roofs, and cover or damage roadways and airport runways. |

| | Description of Impacts |
|---|---|
| People | There have been no recorded injuries or fatalities due to landslides in Akutan. Landslides can injure or kill people due to debris and soil flowing or burying people. |
| Utilities | There have been no recorded landslide impacts to utilities in Akutan. Landslides could damage sewer, water, and utility lines. |
| Transportation | There have been no recorded landslide impacts on transportation systems in Akutan. Road and air travel could be halted or delayed due to landslides damaging or covering the infrastructure. A submarine landslide could create a tsunami or seiche that damages boat harbors or other marine infrastructure, limiting water travel. |
| Economy | There have been no recorded economic impacts due to landslides in Akutan. |
| Subsistence Resources | There have been no recorded landslide impacts to subsistence resources in Akutan. |

#### B.4.1.6.5 Probability of Future Events

The Planning Team reported that steep terrain surrounding the community creates potential for landslides and slope instability. This is of particular concern during heavy rainfall or earthquake events.

Historically, the largest and most destructive landslides have been associated with more than 1.5 inches of rain in a 24-hour period. Precipitation records indicate that precipitation intensities of 2.0 inches in 24 hours can be expected at return periods of 5-10 years. Therefore, the conditions necessary for production of large landslides continue to prevail today even though major, destructive landslides do not occur frequently. Although the probability for ground failure is location-specific, the probability is likely, and increasing, due to future climate events (DHS&EM 2023).

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Akutan will experience a landslide event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### B.4.1.6.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of landslides in the future. |
| Location | It is possible that future climate conditions will influence the location of future landslides in Akutan. Landslide probability is location specific, and numerous variables must be considered. It is common for debris flows to recur in the same channel or to shift slightly. Other types of landslides may reoccur in the same place or the area directly adjacent to a previous landslide. Akutan is located in a highly seismic area, which can trigger landslides at any time, and create areas prone to landslides that did not used to be.<br>Ground failures related to more frequent severe weather events, an increase in atmospheric rivers, and potential droughts are expected to appear in locations that were previously frozen and are now thawing. This includes areas that are immediately adjacent to recently thawed ground and where overlying vegetation has been removed. However, landslides also occur in areas with no prior known instabilities due to changing conditions such as increased rainfall, strong earthquake shaking, and human activities (DHS&EM 2023). |

| Description of Future Conditions | |
|---|---|
| Extent (Magnitude and Severity) | It is likely that future climate conditions will influence the magnitude of future landslides in Akutan. Landslides are expected to increase in magnitude with increased areas of effect as severe weather events increase in frequency (IPCC 2019).<br>Future climate conditions are expected to increase landslide frequency of all intensities, and as people develop across the landscape, including into hazardous areas, there will likely be an increase in more significant outcomes in the future (DHS&EM 2023). |
| Impact | It is likely that future climate conditions will influence the impact of future landslides in Akutan. Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from an increase in atmospheric rivers, severe weather events, and glacial decline (IPCC 2019), which could increase future ground failure events and resultant impacts. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of future landslides in Akutan. Although the probability of ground failure is location-specific, it is likely, and increasing, due to a changing climate. Severe weather events such as precipitation and wind are a direct result of atmospheric warming. Atmospheric rivers are becoming increasingly common and increase the intensity and duration of precipitation events at regional and local scales. Landslide events are directly related to high intensity precipitation events, and those are likely to become more common over greater geographic regions of Alaska (DHS&EM 2023). |
| Population Patterns | It is possible future climate conditions will influence population patterns in Akutan. The Planning Area is experiencing a slight increase in population as an overall trend. Since 2020, the population has remained stable from 1,589 to 1,591 residents (US Census 2026). This may eventually mean more of the resident population living in landslide hazard areas, however an increased growing season due to future climate conditions could lengthen the tourist season. An increase in tourists throughout the year could possibly increase the number of people that are at risk of landslide hazards at any given moment. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Akutan. Limiting development and relocating existing development outside of landslide hazard areas would change the development in these areas. A landslide warning system could require infrastructure development, and more development outside of the landslide zones could increase land use to accommodate displaced residents. It is also possible that land developed in the future, or that has already been developed, may eventually become prone to landslide hazards. |
| Subsistence Resources | It is possible that future climate conditions will result in landslides impacting subsistence resources. Landslides could wipe out land access to certain parts of coastline, berry gathering locations, or trails leading to hunting or fishing grounds. |

### B.4.1.7 Invasive Species

The City of Akutan did not select this hazard to be profiled in the MJHMP Update.

### B.4.1.8 Sediment Deterioration and Land Destabilization

#### B.4.1.8.1 Location

Sediment deterioration and land destabilization can occur throughout Akutan, with coastal land destabilization being the biggest concern for the community. Since Akutan is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.

Riverine land destabilization is not identified as a concern for the community.

At the beginning of 2026, PND Engineers began the "Akutan Beach Erosion Mitigation Project" in the community. This Project consists of collection and analysis of existing data, a site visit, community meeting, shoreline mitigation measures assessment, and hydrodynamic modelling (PND Engineers 2026).

The site visit and fieldwork began in May 2026 and the following was completed: hydrographic surveying, topographic surveying, installation of four water level loggers at the east end of the Village Dock (with local training on how to retrieve loggers and send the data to PND), and sediment sample collection. PND also provided the City of Akutan with a drone for future shoreline change monitoring (PND 2026).

While the extent of sediment deterioration and land destabilization in Akutan varies by location, many facilities along the waterfront may be increasingly vulnerable to future destabilization. Currently, the area in front of the library and along the shoreline area extending to the incinerator are experiencing the most significant shoreline loss (PND Engineers 2026).




Source: PND Engineers, City of Akutan

**Figure B-11- Areas of Concern for Shoreline Loss in Akutan, 2026**

The Planning Team states that Akun Island, which support's the community's airport, is of interest for future land restoration and vegetation projects. The area presents challenges due to coastal sediment deterioration and land destabilization.

#### B.4.1.8.2 History

The history of coastal sediment deterioration and land destabilization in Akutan varies by location due to the localized nature of storms in the community.

Akutan has experienced continual sediment deterioration and land destabilization for several years as the frequency and intensity of storms has increased.

#### B.4.1.8.3 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of land destabilization varies throughout select communities.

In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk. Akutan was categorized in Group 3, which places it at a lower risk of land destabilization according to the study.

**PND Engineers has determined that the main drivers of sediment deterioration and land destabilization in Akutan are:**

- **Poor drainage management**
- **Runoff infiltrates into the bluffs**
- **Seepage raises the pore-water pressure which reduces shear strength of the soil**
- **Groundwater emerges along the bluff face**
- **Wave attack exacerbate deterioration by removing material from the toe of the bluffs**

Photos from the PND August 2026 presentation show coastal erosion ranging from several to tens of feet (see figure below).

The simulated wave climate of the hydrodynamic modelling will be used to determine the required sizing of the proposed shoreline protection measures, giving the City with a strategic plan of mitigation further shoreline loss in the community (PND Engineers 2026).



Source: PND Engineers, City of Akutan

**Figure B-12- Gabion Baskets and Land Destabilization in Akutan, May 2026**




Source: PND Engineers, City of Akutan

**Figure B-13- Current Land Destabilization in Akutan, 5/19/26**

The following photograph was taken in front of the Bayview Hotel on February 21st, 2025. It was submitted by a community member and depicts erosion starting from the Old Library building (the yellow building in the left of the picture).



Source: Vera Pelkey

**Figure B-14- Shoreline Loss in Front of the Old Library, 2/21/2025**

The following photograph was taken in front of the Duplex/Daycare/Teachers Apartment in Akutan. It was submitted by a community member and depicts shoreline loss starting from the Old Library.



Source: Vera Pelkey

**Figure B-15- Shoreline Loss in Front of the Duplex Daycare/Teachers Apartment, 2/21/2025**

The following photograph was taken in front of the Duplex looking east in Akutan. It was submitted by a community member and depicts shoreline loss starting from the Old Library.



Source: Vera Pelkey

**Figure B-16- Shoreline Loss in Front of the Duplex and Looking East**

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the extent of sediment deterioration and land destabilization in Akutan is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### B.4.1.8.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding Akutan has been damages to shoreline and beaches, particularly along areas exposed to waves and storms.<br>In the community, impacts from destabilization have been documented near critical facilities such as the library. |
| Infrastructure | Sediment deterioration and land destabilization impacts in Akutan have been documented near the library and residential homes near the waterfront. Continued land destabilization could threaten additional community infrastructure and increase mitigation costs. |

| Description of Previous Impacts | |
|---|---|
| People | While sediment deterioration and land destabilization can affect residents of Akutan by threatening homes and access to subsistence areas, direct impacts to people in Akutan resulting from sediment deterioration and land destabilization have been limited. |
| Utilities | There have been no documented impacts to the utilities in Akutan from sediment deterioration and land destabilization events. |
| Transportation | The primary transportation related impacts from a sediment deterioration and land destabilization in Akutan are damage to boardwalks, and other transportation infrastructure. There have been no reports of sediment deterioration and land destabilization resulting in substantial disruptions to transportation in Akutan. |
| Economy | There are a substantial number of boardwalks and trails in Akutan that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities. |
| Subsistence Resources | A primary concern related to subsistence resources in Akutan is the loss of subsistence fish camps that have been used for generations, which have the potential to be washed-out or the access restricted during a storm.<br>On Akun Island, future land restoration and vegetation projects are currently at risk due to the impacts of coastal erosion. |

#### B.4.1.8.5 Probability of Future Events

The low-lying geography influences the likelihood of continued sediment deterioration and land destabilization in Akutan.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Akutan will experience a sediment deterioration and land destabilization event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### B.4.1.8.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in Akutan. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in Akutan. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal sediment deterioration and land destabilization in Akutan (AK DGGS 2026). |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in Akutan. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in Akutan. Projected increases in precipitation intensity |

| Description of Future Conditions | |
|---|---|
| | may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in Akutan. Although the probability for sediment deterioration and land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Akutan. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of Akutan entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Akutan. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by sediment deterioration and land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in Akutan. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by sediment deterioration and land destabilization. |

### B.4.1.9 Severe Weather

The City of Akutan Planning Team reports experiencing coastal storms, dense fog, and high winds.

#### B.4.1.9.1 Location

The entire geography of Akutan is susceptible to severe weather events and impacts.

The City of Akutan Planning Team reports that low-lying waterfront areas are most impacted by storm events, including infrastructure such as the Akutan Library and residential homes.

#### B.4.1.9.2 History

Table B-1 lists severe weather events that have occurred in Akutan between 1996 and March 2026. High wind events are the most frequent severe weather event impacting Akutan.

**Table B-1- Historical Severe Weather Events in Akutan (1996 - March 2026)**

| Date | Event Type | Event Description |
|---|---|---|
| 1996-05-24 | High Wind | Wind gusts reached at least 45 mph at Akutan. |
| 1996-10-28 | High Wind | Akutan reported gusts more than 65 mph and 53 mph at Cold Bay. |
| 1996-10-31 | High Wind | Wind gusts reached 54 mph at Cold Bay and close to 85 mph at Akutan. |
| 1996-09-25 | High Wind | Wind gusts reached 60 mph in Akutan. |
| 1996-09-11 | High Wind | Wind gusts of 43 mph from the north were recorded at the Akutan school. |
| 1996-09-12 | High Wind | Strong wind gusts of 70 mph were reported at the Akutan school. |
| 1997-11-04 | High Wind | Wind gusts of 70 to 90 mph were reported at the Akutan school. |
| 2006-02-13 | High Wind | Reports received from the vessel Stimson in Akutan were of wind peaking at 123 KTS that resulted in the vessel "tipping over" in the harbor. |
| 2015-11-11 | High Wind | Damage at Akutan reported by local emergency manager: Construction materials at a new fourplex blown away. Very strong winds still occurring. |
| 2017-11-23 | High Wind | Akutan AWOS measured 76 knot winds at 2:35 a.m. |
| 2020-02-08 | High Wind | Akutan Airport had a peak gust to 84 mph during this time. |
| 2024-01-06 | High Wind | Akutan measured a gust of 89 knots (102 mph). Winds then decreased through the evening hours. Additionally, the storm caused some damage, with a boat flooding due to the weight of the rain and snow and a breakwater which had been damaged previously receiving additional damage. |
| 2024-09-17 | High Wind | A marine exchange observation (site AKXA2 in Akutan) reported a gust to 82 mph at about 2 PM AKST, then later reported a gust to 93 mph about an hour later shortly before 3 pm AKST. The legitimacy of the higher end gust, however, could not be verified by any other sources nearby. |
| 2024-10-04 | High Wind | Wind gusts of 65 knots (75 mph) or greater were observed in Akutan and at other stations around Unalaska. |

| Date | Event Type | Event Description |
|---|---|---|
| 2024-10-10 | High Wind | Numerous other mesonet sites recorded gusts between 75 and 95 mph across the eastern Aleutians, including in Nikolski and Akutan at varying times between approximately 9 AM AKST 10/11 to 5 AM AKST 10/12. |
| 2025-01-22 | High Wind | A C-MAN Station in Akutan reported a wind gust of 82 mph at 4:42 PM AKST on January 22nd. Winds were gusting to over 70 mph for two hours before this peak wind gust was reported and continued to gust to over 70 mph until 6:00 PM AKST the same day. |
| 2025-04-03 | Winter Storm | In Akutan, visibility below half a mile was shown by a webcam in the evening hours of April 3rd. A TV meteorologist from KTUU relayed that a source in Akutan reported 8 to 10 inches of snow accumulation in the town with 2 to 4 ft snow berms on April 4th. Winds gusted to 60 mph. |
| 2025-04-15 | Winter Storm | In Akutan, a news reporter relayed that 10 to 15 inches of snow fell in the settlement with winds gusting to 60 to 80 mph. Snow berms/drifts were built up to 4 feet. |
| 2026-01-04 | High Wind | The Eastern Aleutians including Unalaska and Akutan saw winds gusting over 80 mph from January 4 to January 5. A marine observation site in Akutan (NDBCAKXA2) had a peak wind gust of 107 mph at 2:12 PM AKST January 5. The site also reported more gusts over 100 mph around the same time. |

Source: NOAA NCEI 2026- Storm Events Database

#### B.4.1.9.3 Extent (Magnitude and Severity)

The Planning Team reported that dense fog events can last 1 to 2 weeks, preventing access to the airport and accessing Akutan. The Planning Team reported a maximum wind speed of 123 mph, reported by a boat in the Bay just off the coastline.

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather in Akutan is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### B.4.1.9.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The City of Akutan Planning Team reports that storm events and wave action causes coastal sediment deterioration, leading to long-term concern for waterfront areas. Strong Bering Sea and North Pacific storms bring impacts to the coastline. |
| Infrastructure | The City of Akutan reports that storm events and wave action causes coastal erosion, leading to long-term concern for waterfront infrastructure such as the Akutan Library and residential homes. The Planning Team specifically reported that two skiff landing sites were washed out due to storms in 2025, leaving a pile of rocks where the landings used to be. The Planning Team also reported that high winds during a storm around the year 2022 moved a house a couple of inches and rolled a Conex shipping container into the harbor.<br>The City of Akutan reports that previous high wind impacts include roof damage, building structure damage, and other property damage. High winds have broken windows and damaged other parts of buildings. |
| People | No specific reports of personal injury or death due to severe weather have been reported in Akutan. |

| | Description of Previous Impacts |
|---|---|
| Utilities | The Planning Team reported electrical damage at the new harbor, including the cover of the main panel box blowing off and leading to damage, due to a storm around the year 2022.<br>The City of Akutan reports that previous high wind impacts include power outages. |
| Transportation | The City of Akutan reports that previous high wind impacts include transportation disruptions, specifically to skiffs and boats. Frequent fog disrupts aviation – especially flight cancellations – as well as marine transportation and emergency access. |
| Economy | While the local economy in Akutan has not been significantly impacted by severe weather events, the primary economic driver in the community is fishing. If fishing vessels or the processing plant were to be damaged in a storm, the economy of Akutan would be significantly impacted. |
| Subsistence Resources | Winter storms are causing land destabilization in an area on the front beach where the community cleans and processes fish. |

#### B.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Akutan will experience a severe weather event of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### B.4.1.9.6 Future Climate Conditions

The City of Akutan Planning Team reports that sea level rise, increased storm intensity, and changing precipitation patterns may increase future coastal and infrastructure risk. See the table below for future climate conditions.

**Projected Conditions for Akutan (Achan-ingiiga)**

In Akutan (Achan-ingiiga),
average annual temperatures
may increase by about 7°F by the end of the century.

Winter temperatures are projected to increase the most (+7°F).

Winter may transition from below freezing
to above freezing in the future.

Models have higher uncertainty with regard to precipitation,
but winter is likely to have more precipitation (+25%).

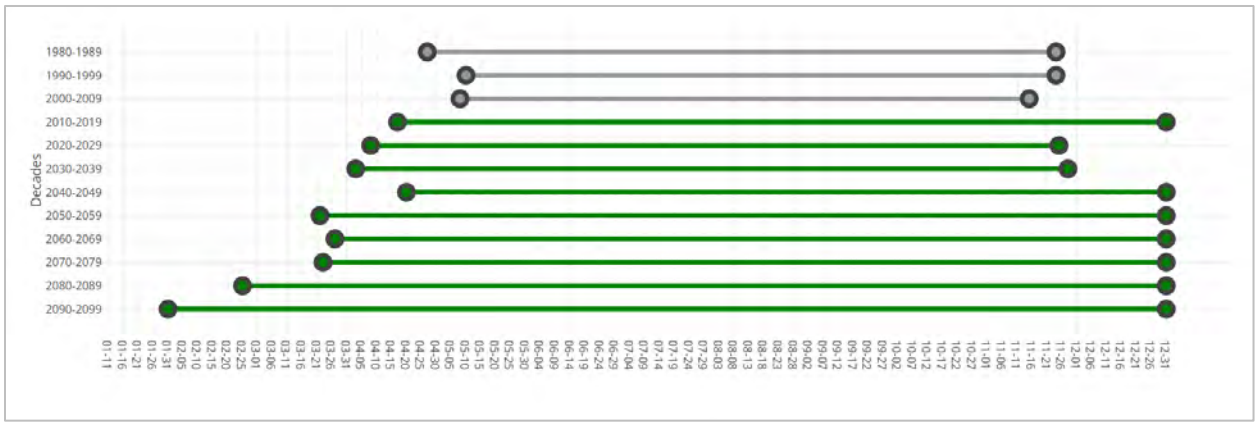
*Source: UAF/SNAP- Northern Climate Reports*

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in Akutan. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in Akutan. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in Akutan. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in Akutan. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in Akutan. | It is unlikely that future climate conditions will influence the nature of future high wind events in Akutan. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in Akutan. | It is possible that future climate conditions will influence the location of future drought/water supply events in Akutan. | It is unlikely that future climate conditions will influence the location of future extreme cold events in Akutan. | It is possible that future climate conditions will influence the location of future heavy rain events in Akutan. | It is unlikely that future climate conditions will influence the location of future heavy snow events in Akutan. | It is unlikely that future climate conditions will influence the location of future high wind events in Akutan. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in Akutan could increase (UAF/SNAP 2025). | In Akutan, average annual temperatures may increase by about 7°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+7°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026).<br>Climate changes within Alaska is likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In Akutan, average annual temperatures may increase by about 7°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+7°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in Akutan. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP).<br>Extreme precipitation events have occurred throughout Alaska with increasing frequency.<br>In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>Akutan experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months. Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). |
| Impact | Projected increases in precipitation and associated moisture availability in Akutan could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026).<br>Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in Akutan are projected to increase; with estimated winter temperature increases of approximately +7°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities in the Aleutians East Borough (Alaska DHS&EM 2023). | While overall temperature trends in Akutan are projected to increase, with estimated winter temperature increases of approximately +7°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In Akutan, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+25%) (UAF/SNAP 2026).<br>As precipitation increases, impacts associated with heavy rainfall (localized flooding, landslide potential, roadway washouts, etc.) will increase. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir levels.<br>The impacts from heavy snow events – such as property and infrastructure | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in Akutan by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in Akutan are projected to increase; with estimated winter temperature increases of approximately +7°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In Akutan, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+25%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in Akutan are projected to increase, with estimated winter temperature increases of approximately +7°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In Akutan, winter is likely to have more precipitation (UAF/SNAP 2026).<br>Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in Akutan may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in Akutan have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in Akutan. | Future conditions of drought are not anticipated to significantly affect population patterns in Akutan. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in Akutan. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | It is not likely that future conditions influencing heavy rain will impact changes in Akutan population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in Akutan population patterns. | It is not likely that future conditions influencing high winds will impact changes in Akutan population patterns. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in Akutan. | Future conditions of drought are not anticipated to substantially affect future land use development in Akutan. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in Akutan, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in Akutan population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in Akutan land use development. | It is not likely that future conditions of high winds will impact changes in Akutan population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in Akutan. | Future conditions of drought may affect subsistence resources in Akutan, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. | Future conditions of extreme cold may affect subsistence resources in Akutan, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. | It is possible that future conditions of heavy rain will impact changes in Akutan land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above Akutan, leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to development of landslide monitoring equipment and/or landslide barriers/diversion structures. | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, thermal stress, and nutrient availability for subsistence species. | It is not likely that future conditions of high winds will impact changes in Akutan land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are milder. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are milder. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | | | |

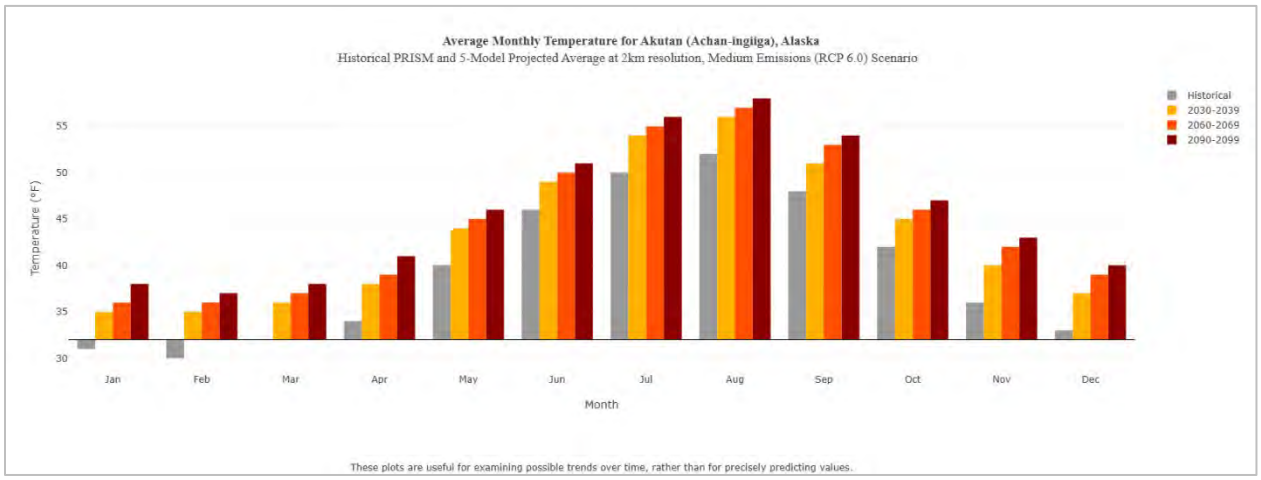
Figure B-17 models historical and future duration of the growing season in Akutan from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure B-17- Historical and Future Projected Changes in Growing Season in Akutan (1980-2099)**

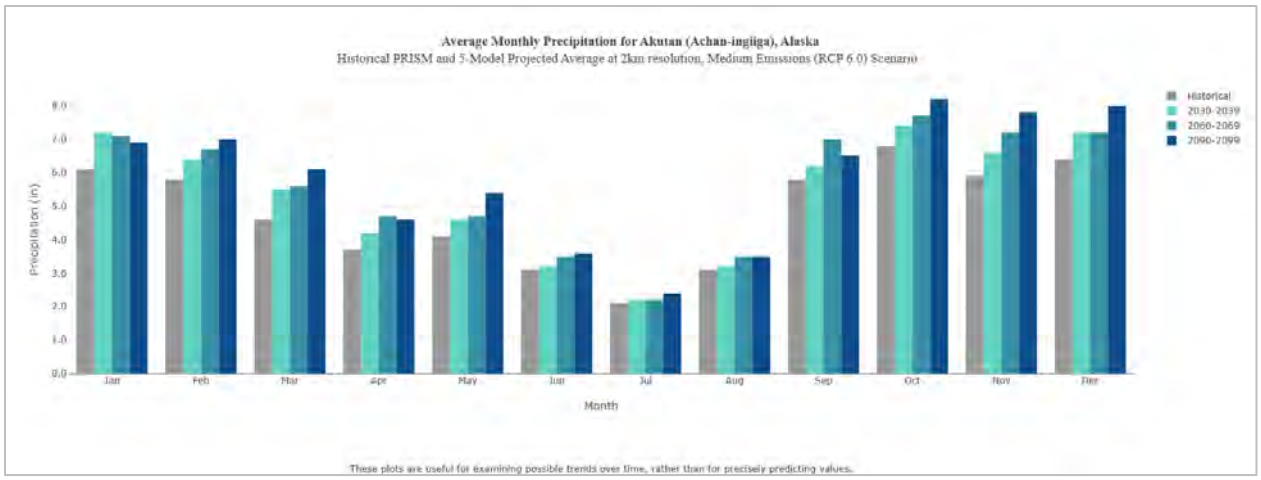
Figure B-18 models historical and future average monthly temperatures in Akutan from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure B-18- Historical and Future Projected Average Monthly Temperature in Akutan (1980-2099)**

Figure B-19 models historical and future average monthly precipitation in Akutan from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure B-19- Historical and Future Projected Average Monthly Precipitation in Akutan (1980-2099)**

### B.4.1.10 Tsunami

#### B.4.1.10.1 Location

Akutan is located on Fox Island. Most infrastructure is at an elevation of approximately 98 feet above sea level. According to FEMA's National Risk Index, the tsunami risk for Akutan is Relatively Moderate. According to the State of Alaska DHS&EM, Akutan has local tsunami potential and a medium risk of distant tsunami potential.

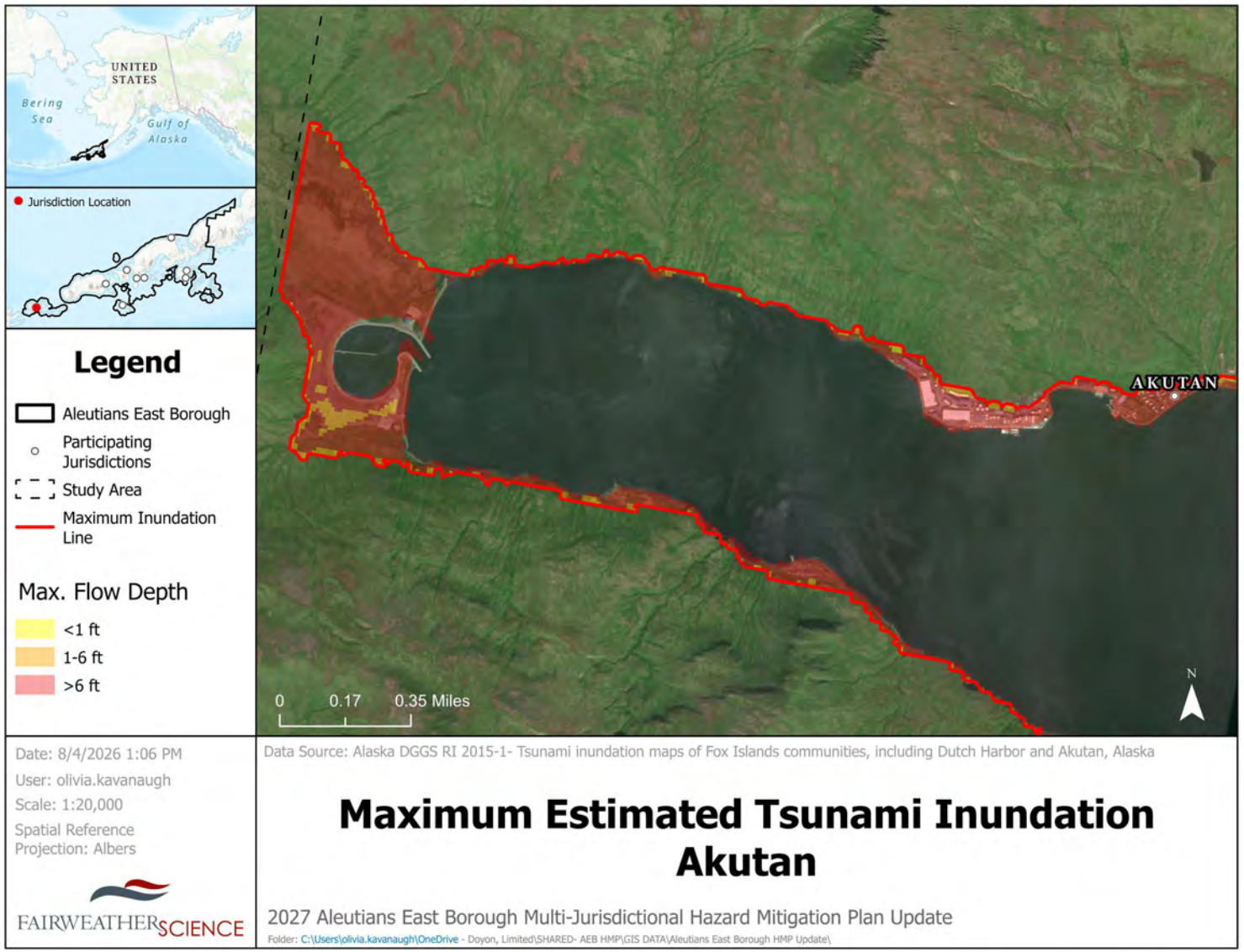



**Figure B-20 - Potential Tsunami Inundation, Akutan**

### B.4.1.10.2 History

Akutan is in a tsunami-prone region due to the nearby subduction zone and frequent earthquakes. Historical tsunami warnings and evacuations have occurred.

Akutan has a tsunami evacuation plan and a tsunami siren, but Akutan is not currently a Tsunami Ready Community (AK DHS&EM 2026).

The Akutan Planning team reported irregular tides, where the water “would go up and down”, in irregular intervals multiple times during the 1960s. No impacts were reported.

Since 1788, there have been 4 documented tsunami runup events in Akutan, which all have been under 1 foot of water depth (Table 3). The most recent runup event in Akutan was recorded in 2015.

**Table B-2- Tsunami Runup Events in Akutan (1788 - August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 66 | 2010-02-27 | AKUTAN, AK | E | 8.8 | 0.72 |
| 70 | 2011-06-24 | AKUTAN, AK | E | 7.3 | 0.13 |
| 73 | 2014-04-01 | AKUTAN, AK | E | 8.2 | 0.16 |
| 78 | 2015-09-16 | AKUTAN, AK | E | 8.3 | 0.23 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

**April 1946 Aleutian Islands Earthquake and Tsunami**

The 1946 Aleutian Islands earthquake and tsunami struck on April 1, 1946, triggered by a powerful magnitude 8.6 undersea earthquake in the Aleutian Trench off Unimak Island, Alaska, which sent devastating Pacific-wide waves that resulted in a handful of deaths in Alaska and 159 deaths in Hilo, Hawaii.

The tsunami completely obliterated the steel-reinforced concrete Scotch Cap Lighthouse on Unimak Island (in the Aleutians East Borough, approximately 60 miles east of Akutan) and killed all five Coast Guard keepers (National Coast Guard Museum 2024).

Tsunami run-up was not recorded in Akutan due to this event.



Source: National Coast Guard Museum 2024

**Figure B-21- Scotch Cap Lighthouse: Before and After the 1946 Tsunami**

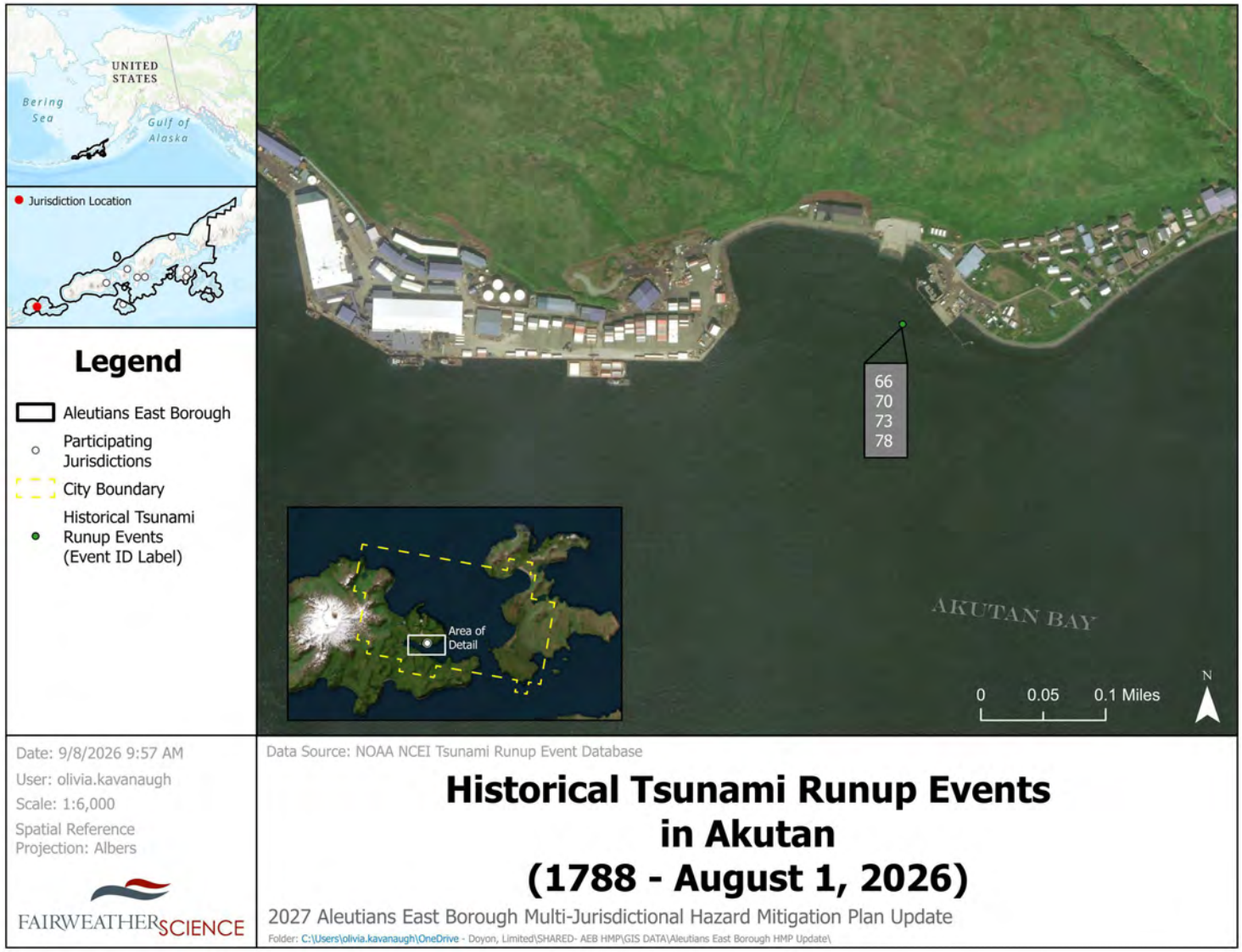



**Figure B-22- Historical Tsunami Runup Events in Akutan (1788 – August 1, 2026)**

### B.4.1.10.3 Extent (Magnitude and Severity)

Akutan has experienced tsunami runups ranging in size from less than one foot in depth to over 23 feet in depth.

Based on the inundation mapping (Figure B-20), most areas of Akutan, including the population center and majority of critical facilities, have the potential of inundation of greater than 6 feet of water.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in Akutan is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

### B.4.1.10.4 Impact

Tsunami warnings and evacuations have occurred in Akutan.

| Description of Impacts | |
|---|---|
| Geography/Land | Previous impacts from tsunamis on the land or geography includes inundation of less than 1 foot in Akutan. Inundation of coastal areas is possible in the future, which could change shorelines. |
| Infrastructure | There are no previous impacts that have impacted infrastructure in Akutan. A tsunami could cause flood damage to coastal structures, and the force of the wave could damage walls, boat harbors, and other coastal infrastructure.<br><br>Critical infrastructure at risk includes the Tribal Office, Salmonberry Inn, Akutan Tsunami Shelter, Museum/Library building, Day Care Facility, Recreation Center, Cemetery, Akutan Church Cemetery, VPSO housing and jail, Akutan Roadhouse, McGlashan Store, St. Alexander Nevsky Church, school, City Hall, Public Safety Office, Equipment Warehouse, Clinic, Akutan Helicopter Hanger, Public Dock Facility, New Boat Harbor House, Airport Shed, GCI, ATT, ACS Communication Tower, GCI Communication Tower, ATT Communication Tower, Wind Farm, Warehouse, Bulk Fuel Storage, Harbor Power House, Hydro Generator, Generator Building, Water Treatment Plant, Primary Electrical Distribution System, Recycle Plant, Incinerator Building, Pump House, and 3 fuel tanks. |
| People | There have been no recorded injuries or deaths due to tsunamis in Akutan. People could drown, suffer hypothermia, or injure themselves if caught in a tsunami wave. |
| Utilities | There have been no recorded utility disruptions due to tsunamis in Akutan. A tsunami could damage underwater cables, sewer and water lines, and utility poles. |
| Transportation | There have been no recorded impacts to transportation systems due to a tsunami in Akutan. Potential inundation of roadways and airport runways could limit or delay land and air travel, while damage to boat harbors, vessels, and other marine transportation infrastructure could impede travel by water. |
| Economy | There have been no economic impacts due to tsunamis in Akutan. |
| Subsistence Resources | There have been no recorded impacts on subsistence resources due to tsunamis in Akutan. A tsunami could limit access to subsistence fishing grounds during and after an event, or damage land resources if they are inundated. |

### B.4.1.10.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Akutan will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

### B.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in Akutan is not anticipated to change in the future. |
| Location | The location of tsunami events in Akutan is not anticipated to change in the future. All low-lying coastal areas in Akutan will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in Akutan. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in Akutan. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in Akutan. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in Akutan, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in Akutan could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in Akutan, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in Akutan, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area. Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in Akutan. |

### B.4.1.11 Volcano

#### B.4.1.11.1 Location

The entire geography of Akutan is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Akutan.

According to the 2023 State of Alaska HMP, Akutan is located in a **moderate** volcanic ash hazard level area.

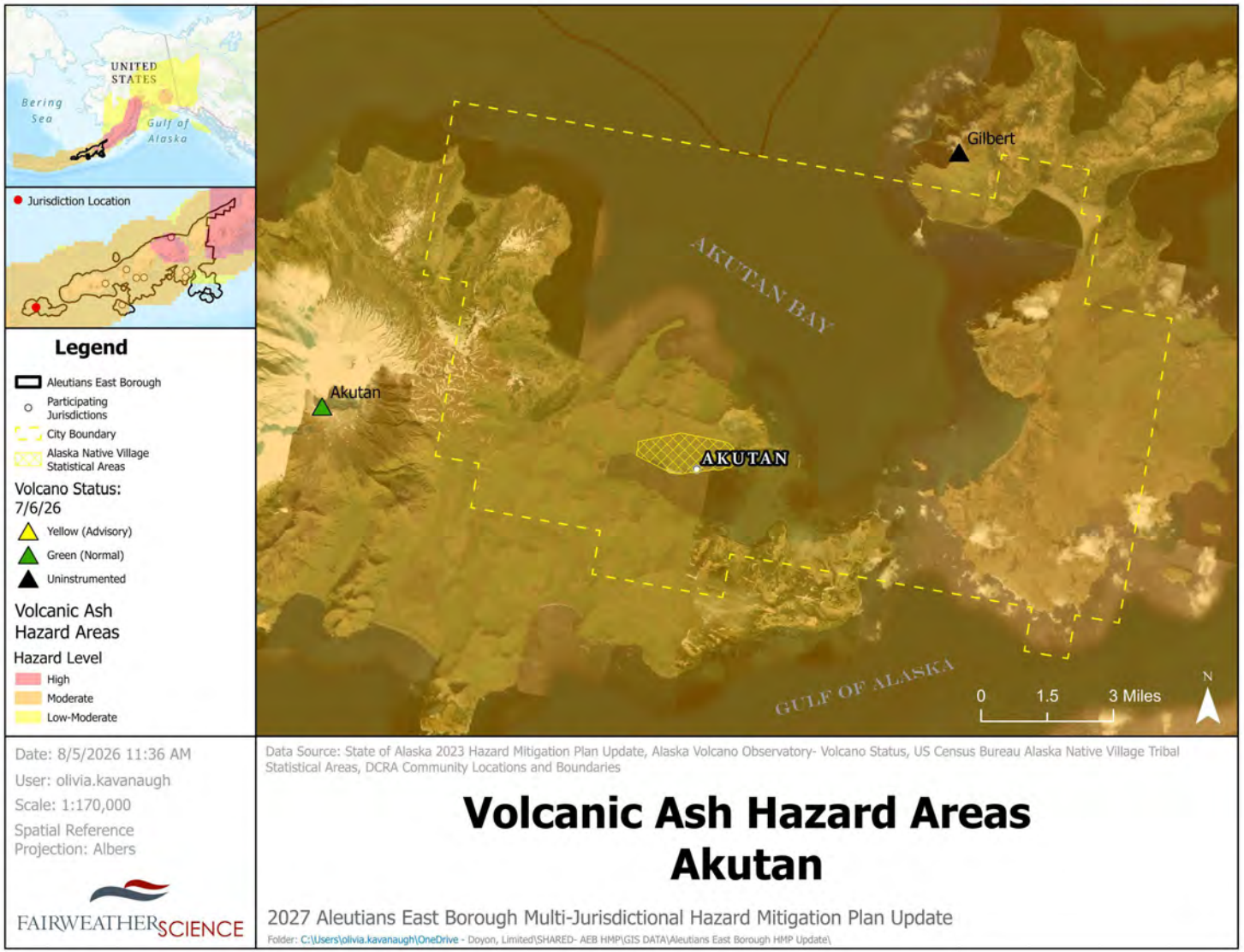



**Figure B-23 – Akutan Volcanic Hazard Areas**

#### B.4.1.11.2 History

Akutan has had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to Akutan is **Mount Akutan**, which has resulted in several eruptions that have impacted the community. Located approximately 8 miles west of Akutan, Mount Akutan has erupted a total of 25 times since 1900 (AVO 2026).

Akutan eruptions in 1946, 1951, 1962, 1988, 1989, 1991, and 1992 resulted in trace ash fall being reported in the community. The threat of ashfall was so great during the 1947 eruption that Akutan had to be temporarily evacuated to prevent injury or death (AVO 2026). While the majority of Akutan eruptions resulted in only trace ashfall in the community, an eruption in 1962 resulted in ashfall infiltrating the community water system and covering the village boardwalks.

#### B.4.1.11.3 Extent (Magnitude and Severity)

Akutan is located in relatively close proximity to Mount Akutan, which has produced large eruptions over the past century, and has averaged an eruption approximately every four years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, Akutan has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community. The notable exception occurred in 1962, when an eruption from Mount Akutan impacted the community with a thick layer of ash covering the community boardwalk that required it to be swept (AVO 2026).

The Planning Team reported that the last eruption in 1947 included a lava flow on the northeast side of the island that was hundreds of feet thick in some places. There were no reports of significant ash piling up during that event.

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcano and resultant impacts in Akutan is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### B.4.1.11.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding Akutan has been ashfall. While the majority of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposit (USGS 2015). |
| Infrastructure | Aside from the ashfall on the village boardwalk in 1962, the historical ashfall reported in Akutan has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of Akutan from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. There are no credible reports of any health effects resulting from ashfall infiltrating the community water system during the 1962 eruption of Mount Akutan. |
| Utilities | While the majority of historical volcanic eruptions impacting Akutan have not resulted in significant utility disruptions, reports from the 1962 Mount Akutan eruption indicated that the eruption caused volcanic ash to infiltrate the water system in the community. |
| Transportation | The primary transportation related impact from a volcanic eruption in Akutan is aircraft interruptions. There have been no reports of a volcanic eruption resulting in the closure of the Akun Island runway. |

| | Description of Previous Impacts |
|---|---|
| Economy | While volcanic ashfall can disrupt Akutan's economy by disrupting work and transportation, the historical impact has generally been indirect and limited. |
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in Akutan that has impacted the community's access to subsistence resources. |

#### B.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact Akutan.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 7, it is **Highly Likely** Akutan will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### B.4.1.11.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in Akutan. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in Akutan. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in Akutan. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in Akutan. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in Akutan. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in Akutan. |
| Land Use Development | Future climate conditions are not expected to influence land use development in Akutan. |
| Subsistence Resources | Future climate conditions are not expected to influence Akutan's ability to access subsistence resources. |

### B.4.1.12 Wildland Fire

#### B.4.1.12.1 Location

Akutan is characterized by cool, wet conditions that support predominantly low-growing vegetation. Vegetation around the community consists largely of grasses and low shrubs, with limited tree cover. These vegetation types generally do not represent highly continuous or heavy wildfire fuels, and the cool, moist climate further limits the potential for frequent or severe wildfires.

According to LANDFIRE's (Landscape Fire and Resource Management Planning Tools Project) 2025 Alaska Statewide Wildfire Exposure Assessment, the majority of the Akutan Planning Area is located in an area that is **Minimally Exposed to Wildfire Hazard**. The population center of Akutan is located in an area that is Infrequently Exposed to Wildfire Hazard.

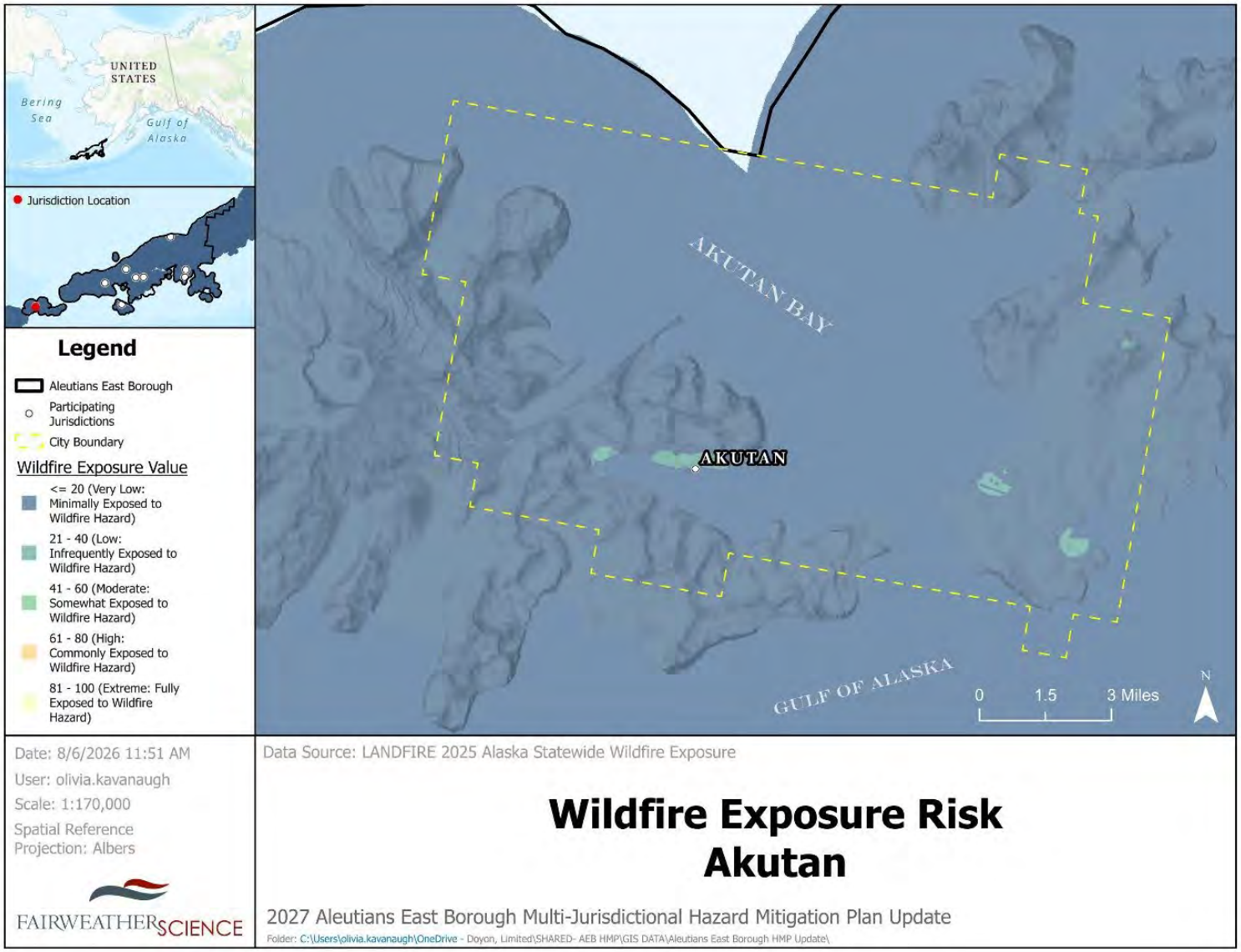



**Figure B-24- Wildfire Exposure Risk- Akutan**

### B.4.1.12.2 History

Table B-3 lists historical fires in and around Akutan from 1939 to December 2025. None of these fires had a confirmed natural cause due to lightning and were all human-caused due to debris burning (AICC 2026). Locations of these events are shown in Figure B-26.

The Planning Team also states there have been several smaller fires near the community incinerator in the past.

There have been no State or Federal disaster declarations in Akutan due to wildfires.

**Table B-3- Historical Wildfires in Akutan (1939 - December 2025)**

| Discovery Date | Name | Prescribed Fire? | Latitude | Longitude | Estimated Total Acres | Cause |
|---|---|---|---|---|---|---|
| June 2007 | - | No | - | - | "about 1 square mile" | Debris Burning-Incinerator |
| 2018-02-20 | Akutan | No | 54.13308 | -165.789 | 17.9 | Debris Burning-Open Trash Burn |
| 2018-02-26 | Trident | No | 54.13303 | -165.788 | 0.5 | Debris Burning-Open Trash Burn |

Source: KUCB Archive 2007, AICC 2026



Source: Alaska's News Source 2018. Photo Credit: Bill Newberry

**Figure B-25- 2018 Fire at Trident Seafoods Facility in Akutan**




Note: the 2007 fire near the incinerator is not included in this map as this event is not in the AICC database

**Figure B-26- Historical Fire Events near Akutan (1939 - December 2025)**

#### B.4.1.12.3 Extent (Magnitude and Severity)

Wildfire can destroy vegetation, negatively impact air quality, and leave land scarring that could increase the risk of landslides, flood, and sediment deterioration/land destabilization.

The largest fire near Akutan occurred near the Trident Seafoods facility and burned nearly 18 acres of grassy hillside in February 2018. This fire was due to an open trash burn. Another fire occurred at the facility six days later and burned 0.5 acres. This fire was also due to an open trash burn.

A fire near the community incinerator burned about 1 square mile of land in Akutan in June 2007. The fire burned for about four hours and burned itself out before it reached the town (KUCB Archive 2007).

Based on the extent of past wildfire events and the criteria identified in Table 5 of the Base Plan, the extent of wildfire in Akutan is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### B.4.1.12.4 Impact

Two historic fire events in Akutan were located at the Trident Seafoods processing facility, about a quarter mile from town. The plant was not damaged in these fires, but the grassy hillside above the facility was burned. The VPSO at the time, Monte Chitty, stated that it rained the night before, which likely reduced the overall spread and impact of the fire (Alaska's News Source 2018). He also noted that if the winds were blowing in a different direction, high winds that spread that fire could have easily driven the fire directly at the village (Alaska's News Source 2018).

In the future, impacts from wildfire could destroy homes, subsistence resources such as berries or other edible plants, and threaten lives.

Wildland fires can cause air transportation impacts including damage to structures that support air travel and fire fighting equipment and personnel. Smoke from wildland and urban fires can disrupt air transportation and in extreme scenarios, fire can damage runway areas making them not suitable for aircraft arrivals and departures.

#### B.4.1.12.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Akutan will experience a wildfire event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### B.4.1.12.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of wildland fires in the Akutan Planning Area is not anticipated to change in respect to future climate conditions. |
| Location | The location of wildland fires in the Akutan Planning Area is anticipated to change slightly in respect to future climate conditions, as some areas see a higher likelihood of burning than in the past. |
| Extent (Magnitude and Severity) | Due to future climate conditions, the extent (magnitude and severity) of wildland fires is expected to increase in Alaska in general. Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050 (EPA 2022). In the AEB, more acreage is trending from "less likely to burn" to "more likely to burn" (UAF IARC 2026). |
| Impact | Due to future climate conditions, the impact of wildland fires on the Akutan Planning Area may increase. More frequent fires due to a change in future conditions may increase the risk of health hazards and low visibility posed by the increase of smoke (AFSC 2025). |

| Description of Future Conditions | |
|---|---|
| Probability of Future Events | Future climate conditions within Alaska are likely to result in increased drought and longer fire seasons. Shifts in vegetation will influence the intensity and frequency of fires (IPCC 2019). A warming climate is also projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018).<br>Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050, however this is most applicable to Alaska's most fire-prone regions in the interior (EPA 2022). |
| Population Patterns | Wildland fires due to future climate conditions are not anticipated to impact population patterns in the Akutan Planning Area. |
| Land Use Development | Wildland fires due to future climate conditions may influence the location of future development in areas with higher fire risk, although in most areas with year-round populations and infrastructure, the wildfire risk is expected to remain low. |
| Subsistence Resources | A warming climate is projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018). |

## B.4.2 Critical Facilities

**Table B-4- Critical Facilities- City of Akutan**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | City of Akutan | Commercial | 20 | Salmonberry Inn | Boardwalk | 54.13426 | -165.774691 | $2,000,000 | W1 | Akutan Corporation | Unknown | | x | x | | x | x | x | x | x | x | | |
| 2 | City of Akutan | Commercial | 10 | Surf Inn Bunkhouse & Staff Quarters | Akun Island | 54.14768709 | -165.6066124 | $846,481 | | | | | | x | | x | | x | | x | x | | |
| 3 | City of Akutan | Commercial | 10 | Surf Inn Kitchen and Bath | Akun Island | 54.14742315 | -165.6068914 | $458,058 | | | | | | x | | x | | x | | x | x | | |
| 4 | City of Akutan | Commercial | 2 | Resident Manager's House | Akun Island | 54.14768079 | -165.6074707 | $313,025 | | | | | | x | | x | | x | | x | x | | |
| 5 | City of Akutan | Community | 20 | Akutan Tsunami Shelter/Community Center | Foot trail | 54.134061 | -165.77975 | $1,313,000 | Wood | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | | |
| 6 | City of Akutan | Community | 0 | Boardwalk System | throughout the community | throughout the community | throughout the community | $10,000,000 | Wooden boardwalk | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 7 | City of Akutan | Community | 20 | Multi Purpose/ Museum/Library | 113 Boardwalk | 54.13529 | -165.769302 | $2,977,600 | Wood | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | x | |
| 8 | City of Akutan | Community | 10 | City Administrative Building | 109 Windy Way | 54.1343 | -165.773404 | $2,958,896 | Wood | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 9 | City of Akutan | Community | 10 | Day Care Facility | | 54.13528188 | -165.7694923 | $2,522,089 | | | | | x | x | | x | x | x | x | x | x | x | |
| 10 | City of Akutan | Community | 20 | Recreation Center | 113 Boardwalk | 54.135339 | -165.769891 | $2,000,000 | Unknown | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | x | |
| 11 | City of Akutan | Community | 5 | Cemetery - Nic Sias Memorial Landing | | 54.134191 | -165.778348 | $1,000,000 | | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 12 | City of Akutan | Community | 0 | Akutan Church Cemetery | 14 Boardwalk | 54.133476 | -165.775222 | $1,000,000 | Unknown | Church | Church | | x | x | | x | x | x | x | x | x | | |
| 13 | City of Akutan | Community | 10 | VPSO/Jail | | 54.13506448 | -165.7715562 | $552,178 | Wood | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 14 | City of Akutan | Community | 0 | Akutan Roadhouse | Foot trail | 54.133859 | -165.777429 | $500,000 | Unknown | Akutan Corporation | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 15 | City of Akutan | Community | 0 | McGlashan Store | Foot trail | 54.133699 | -165.777088 | $500,000 | Unknown | Akutan Corporation | Unknown | | x | x | | x | x | x | x | x | x | | |
| 16 | City of Akutan | Community | 0 | St. Alexander Nevsky Church | 14 Boardwalk | 54.133404 | -165.775019 | $100,000 | Unknown | Church | Church | | x | x | | x | x | x | x | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | City of Akutan | Educational | 100 | School | 202 Volcano Dr | 54.13499 | -165.772118 | $7,361,187 | Unknown | Aleutians East Borough | Unknown | | x | x | | x | x | x | x | x | x | x | |
| 18 | City of Akutan | Government | 20 | City Hall | 113 Boardwalk | 54.13451 | -165.77318 | $2,958,896 | Wood | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | x | |
| 19 | City of Akutan | Government | 10 | Public Safey Office | 89 Boardwalk | 54.134038 | -165.773604 | $552,178 | Unknown | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | | |
| 20 | City of Akutan | Government | 0 | Equipment Warehouse | 100 Windy Way | 54.1343 | -165.773404 | $215,388 | Wood | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 21 | City of Akutan | Medical | 10 | Clinic | 89 Boardwalk | 54.134188 | -165.773776 | $2,069,620 | Wood | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 22 | City of Akutan | Transportation | 0 | Akutan Harbor Float (Small Boat Harbor) | 101 Salmon Berry Rd | 54.133339 | -165.777576 | $60,000,000 | Marine Structure | City of Akutan | City of Akutan | | x | x | x | x | x | x | | x | x | | |
| 23 | City of Akutan | Transportation | 5 | Akutan Airport | Akun Island | 54.14564381 | -165.6055076 | $20,000,000 | Airport | State of AK | State of AK | | | x | | | | x | | x | x | | |
| 24 | City of Akutan | Transportation | 0 | Akutan Helicopter Hanger | n/a | 54.13173 | -165.824014 | $5,336,820 | S3 | AEB | City of Akutan, Aleut Corporation, Akutan Corporation, AEB | | | x | | x | | x | x | x | x | | |
| 25 | City of Akutan | Transportation | 0 | Public Dock Facility | 101 Salmon Berry Rd | 54.133229 | -165.777265 | $5,220,791 | Marine Structure | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | | |
| 26 | City of Akutan | Transportation | 0 | Seaplane Base Ramp | | 54.133834 | -165.778411 | $2,000,000 | Concrete | State of AK | State of AK | | x | x | | x | x | x | | x | x | | |
| 27 | City of Akutan | Transportation | 0 | New Boat Harbor House | | 54.131894 | -165.8238548 | $266,640 | | | | | | x | | x | | x | x | x | x | | |
| 28 | City of Akutan | Transportation | 0 | Airport Shed | Foot Trail | 54.133918 | -165.777654 | $5,000 | Unknown | State of AK | State of AK | | x | x | | x | x | x | x | x | x | | |
| 29 | City of Akutan | Utilities | 0 | Communication Tower - GCI | Foot Trail | 54.133564 | -165.776743 | $20,000,000 | Steel Tower | GCI | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 30 | City of Akutan | Utilities | 0 | Communication Tower - ATT | Foot Trail | 54.133189 | -165.776217 | $20,000,000 | Steel Tower | ATT | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 31 | City of Akutan | Utilities | 0 | Communication Tower - ACS | Foot Trail | 54.133161 | -165.77631 | $20,000,000 | Steel Tower | ACS | City of Akutan | | x | x | x | x | x | x | x | x | x | | |
| 32 | City of Akutan | Utilities | 0 | Akutan Hydro Dam | | 54.14264 | -165.77405 | $20,000,000 | Concrete dam | City of Akutan | City of Akutan | | x | x | | | x | x | | x | x | x | |
| 33 | City of Akutan | Utilities | 0 | Wind Farm | Boardwalk | 54.135377 | -165.768326 | $10,000,000 | Unknown | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 34 | City of Akutan | Utilities | 0 | Warehouse | | 54.13507836 | -165.7715347 | $6,193,691 | | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35 | City of Akutan | Utilities | 0 | Bulk Fuel Storage (new) | | 54.13393632 | -165.7787358 | $3,091,840 | Steel Tank | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 36 | City of Akutan | Utilities | 0 | Harbor Power House (inside electric plant) | | 54.13347377 | -165.7770646 | $2,413,594 | Utility Building | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 37 | City of Akutan | Utilities | 0 | Fuel Tank | Foot Trail | 54.133301 | -165.776055 | $2,000,000 | Steel tank | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 38 | City of Akutan | Utilities | 0 | Water Storage Tank | | 54.13617 | -165.770777 | $2,000,000 | Unknown | City of Akutan | City of Akutan | | x | x | | x | x | x | | x | x | x | |
| 39 | City of Akutan | Utilities | 0 | Hydro Generator/Generator | Boardwalk | 54.135167 | -165.770497 | $1,344,385 | Steel | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | x | |
| 40 | City of Akutan | Utilities | 0 | Generator Building | Foot Trail | 54.133304 | -165.775941 | $1,084,902 | Steel | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 41 | City of Akutan | Utilities | 0 | Water Treatment Plant | Boardwalk | 54.135074 | -165.771554 | $964,166 | Wood | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 42 | City of Akutan | Utilities | 0 | Sewer System | | throughout the community | throughout the community | $904,486 | | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 43 | City of Akutan | Utilities | 0 | Primary Electrical Distribution System | | 54.1328993 | -165.783133 | $798,118 | Utility Infrastructure | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 44 | City of Akutan | Utilities | 0 | Akun Island Fuel Tank Farm | Akun Island | 54.147863 | -165.6081252 | $785,325 | | | | | | x | | x | | x | | x | x | | |
| 45 | City of Akutan | Utilities | 0 | Harbor Outside Electric Plant | | 54.13347377 | -165.7770646 | $621,976 | Utility Building | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 46 | City of Akutan | Utilities | 0 | Recycle Plant | Boardwalk | 54.135444 | -165.76327 | $500,000 | Unknown | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 47 | City of Akutan | Utilities | 0 | Harbor Power Fuel Tank Farm | | 54.13254776 | -165.7856896 | $479,364 | Steel Tank | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 48 | City of Akutan | Utilities | 0 | Incinerator Building (old) | Boardwalk | 54.135013 | -165.770779 | $339,601 | Steel | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 49 | City of Akutan | Utilities | 0 | Pumphouse | | 54.1328365 | -165.7830136 | $176,011 | | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 50 | City of Akutan | Utilities | 0 | Fuel Tanks- (3) 10,000 gallon capacity | Trident Way | 54.13249 | -165.78592 | $160,859 | Steel tank | City of Akutan | Unknown | | x | x | | x | x | x | x | x | x | | |
| 51 | City of Akutan | Utilities | 0 | Garage | Foot Trail | 54.133168 | -165.775833 | $128,696 | Wood | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 52 | City of Akutan | Utilities | 0 | Street Lights | | throughout the community | throughout the community | $41,642 | | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| **Total Occupants:** | | | **282** | | | | **Total Estimated Value:** | **$249,056,503** | | | | | | | | | | | | | | | |

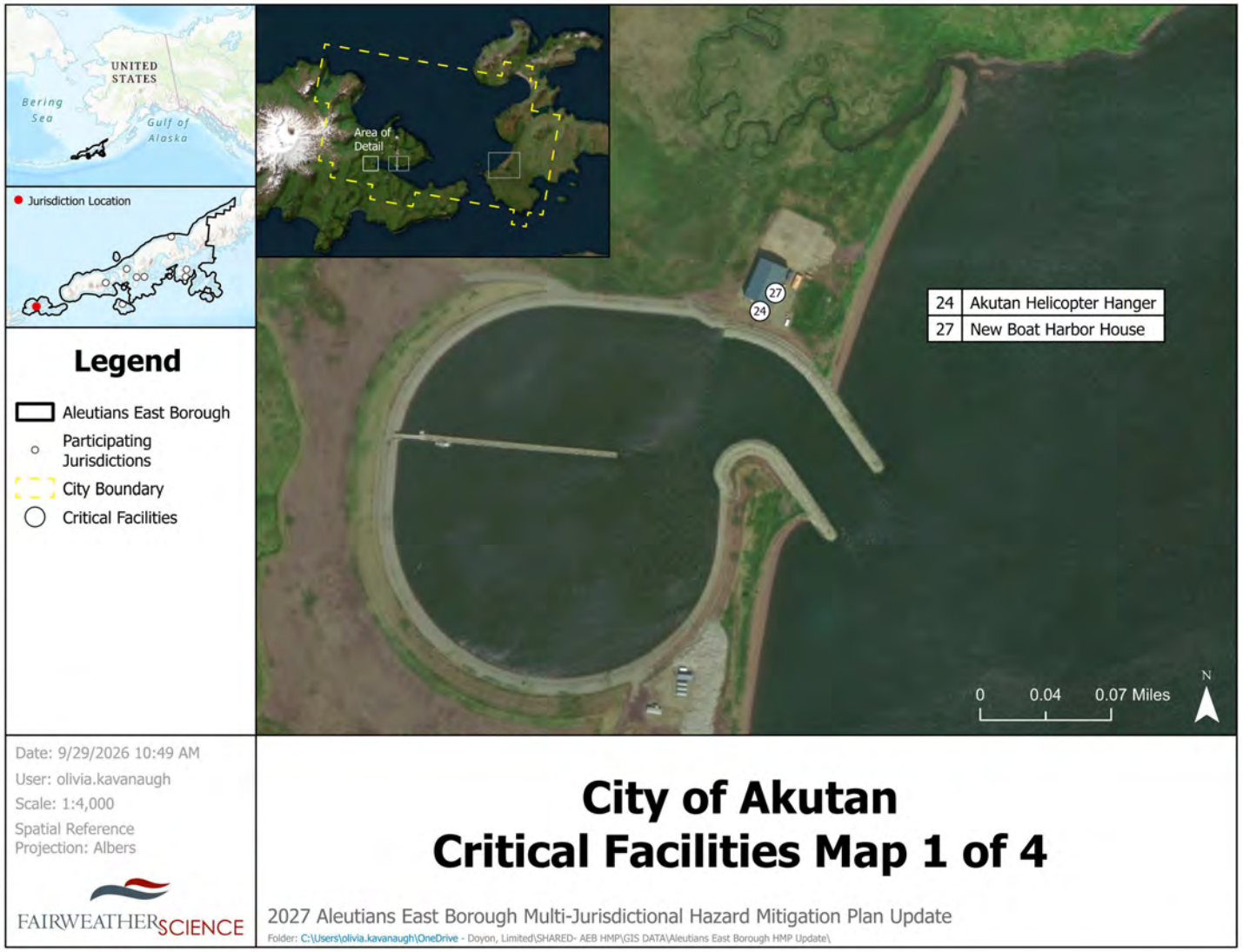



**Figure B-27- City of Akutan Critical Facilities Map 1 of 4**

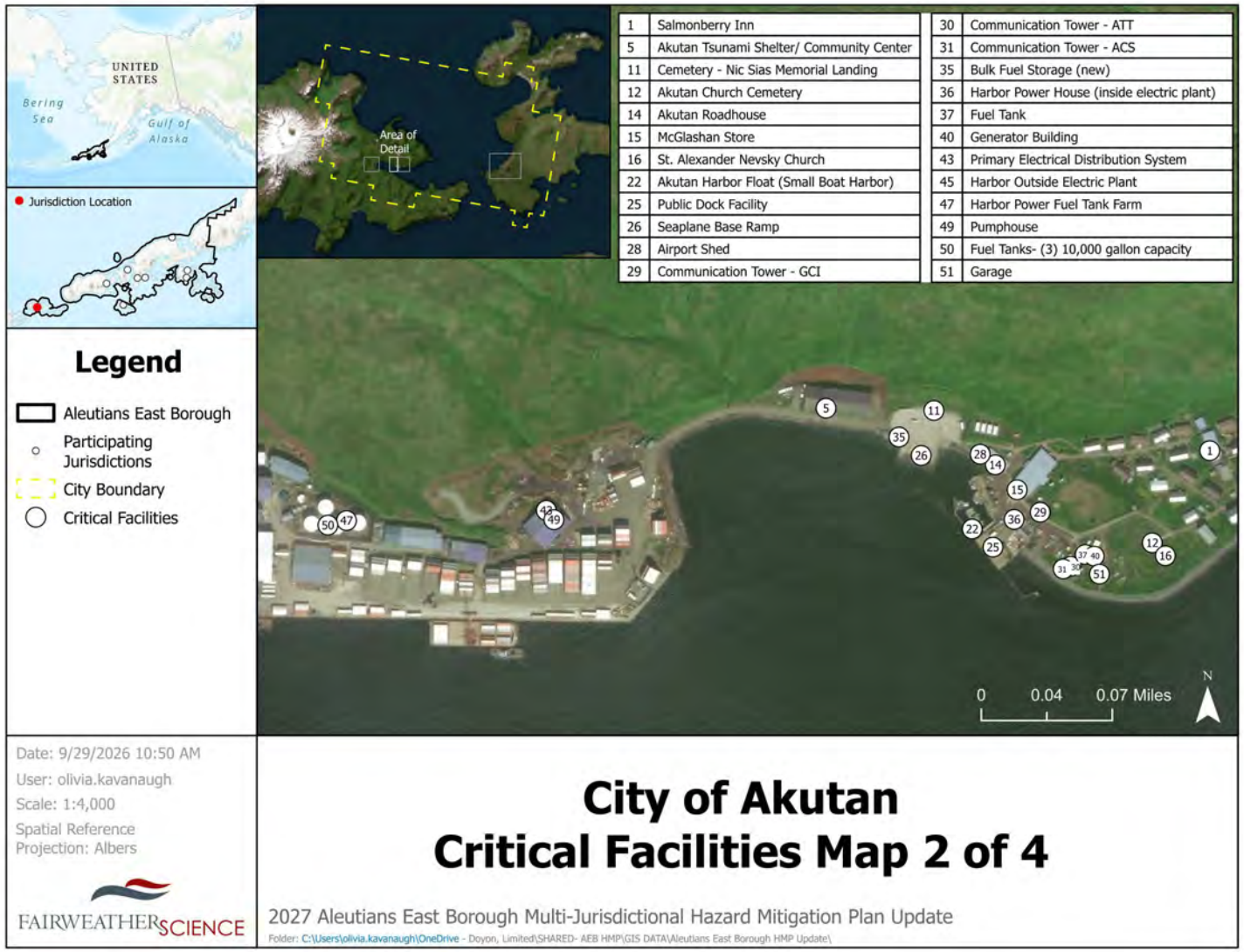



**Figure B-28- City of Akutan Critical Facilities Map 2 of 4**

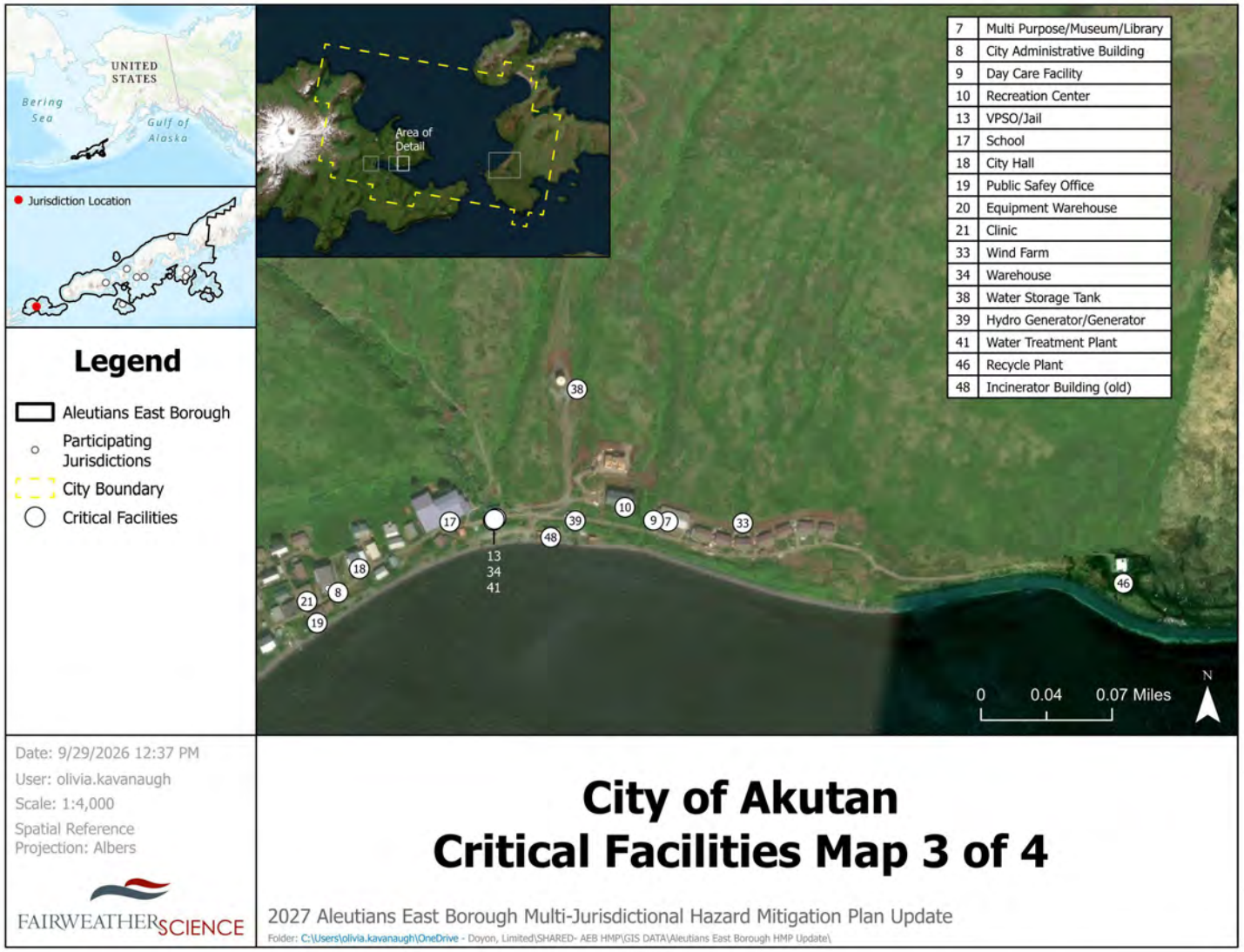



**Figure B-29- City of Akutan Critical Facilities Map 3 of 4**

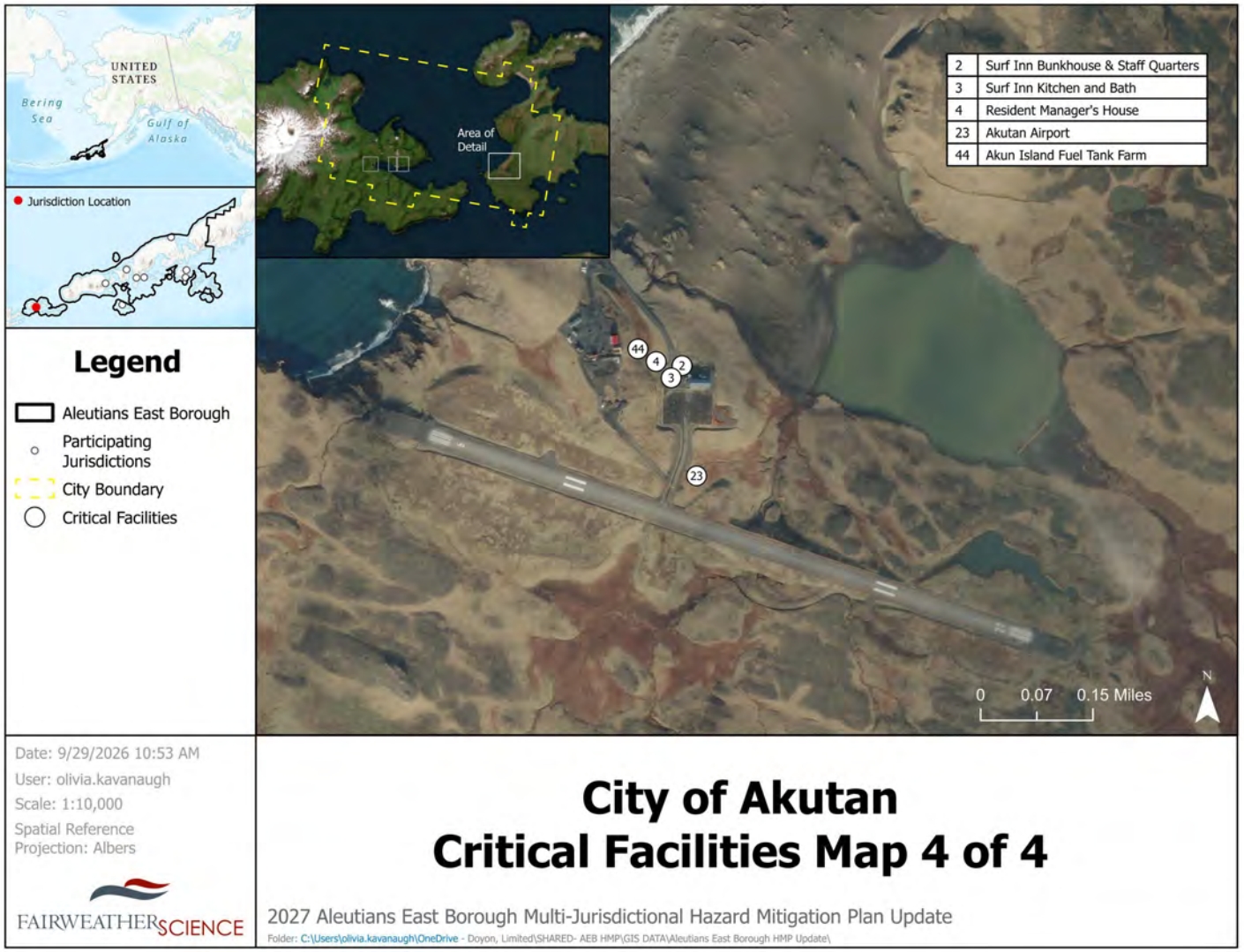



**Figure B-30- City of Akutan Critical Facilities Map 4 of 4**

## B.4.3 Summary of Vulnerability

**Table B-5- Jurisdictional Summary of Vulnerability- City of Akutan**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere-Snow Avalanche | 45 | 255 | $221,050,154 | 38 | 152 | $27,545,744 |
| Earthquake | 52 | 282 | $249,056,503 | 38 | 152 | $27,545,744 |
| Sediment Deterioration and Land Destabilization | 14 | 50 | $109,256,017 | 4 | 16 | $2,899,552 |
| Flood | 50 | 277 | $209,056,503 | 38 | 152 | $27,545,744 |
| Ground Failure/ Landslide | 45 | 255 | $221,050,154 | 38 | 152 | $27,545,744 |
| Severe Weather | 52 | 282 | $249,056,503 | 38 | 152 | $27,545,744 |
| Tsunami | 43 | 255 | $142,653,614 | 38 | 152 | $27,545,744 |
| Volcano | 52 | 282 | $249,056,503 | 38 | 152 | $27,545,744 |
| Wildland Fire | 52 | 282 | $249,056,503 | 38 | 152 | $27,545,744 |
| Dam Failure | 17 | 190 | $63,334,205 | 8 | 32 | $5,799,104 |
| Invasive Species | Did not profile this hazard | | | | | |

Akutan's vulnerability to natural hazards extends beyond potential damage to buildings and infrastructure. Community-provided information identifies subsistence access as vulnerable to storms, high winds, coastal flooding, tsunamis, earthquakes, volcanic ashfall, dense fog, and transportation disruptions. These conditions may limit access to subsistence areas, delay travel by boat or aircraft, or reduce opportunities to harvest resources safely. Damage to docks, harbors, transportation infrastructure, or utility systems may also disrupt access to, processing of, and storage of subsistence resources.

## B.5 Capability Assessment

***Note: the City of Akutan does not participate in the National Flood Insurance Program (NFIP).***

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| **Plans** | | |
| Capital Improvements Plan | Yes | |
| Climate Change Adaptation Plan | No | |
| Community Wildfire Protection Plan | No | |
| Comprehensive/Master Plan | Yes | Dated 1982, Community Plan dated 2005 |
| Continuity of Operations Plan | Yes | Akun Airport Operations Plans & Akun Airport Development Scenarios have been developed. |
| Economic Development Plan | No | |
| Land Use Plan | Yes | |
| Local Emergency Operations Plan | Yes | |
| Stormwater Management Plan | Yes | |
| Transportation Plan | No | |
| **Land Use Planning and Ordinances** | | |
| Acquisition of land for open space and public recreation use | Yes | |
| Building code | Yes | |
| Flood insurance rate maps | No | |
| Floodplain ordinance | No | |
| Substantial Damage Plan | No | |
| Natural hazard specific ordinance (stormwater, steep slope, wildfire) | No | |
| Subdivision ordinance | Yes | |
| Zoning ordinance | Yes | |
| **Administrative** | | |
| Chief Building Official | No | |
| Civil Engineer | No | |
| Community Planner | No | |
| Emergency Manager | No | |

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| Floodplain Administrator | No | |
| GIS Coordinator | No | |
| Planning Commission | Yes | |
| **Technical** | | |
| Grant writing | Yes | There is no dedicated grant writer position within the City. However, the City Administrator, Finance Manager, and consultants work collaboratively to identify funding opportunities and prepare and submit grant applications. |
| Hazard data and information | No | |
| GIS analysis | No | |
| Mutual aid agreements | No | |
| **Funding Resources** | | |
| Capital improvements project funding | Yes | Combination of local, state, federal funding. |
| Community Development Block Grant | Yes | Aleutian East Borough & Aleutian Pribilof Island Community Development (APICDA) grants. |
| Federal funding programs (non-FEMA) | Yes | HUD, Denali, CDS grants |
| Fees for water, sewer, gas, or electric services | Yes | Water/ Sewer provided by City; charge for electricity. |
| Impact fees for new development | No | |
| State funding programs | Yes | Community Assistance Program |
| Stormwater utility fee | No | |
| **Community Programs/Organizations** | | |
| Community newsletters | No | |
| Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events) | No | |
| Local news | No | |
| Organizations that represent/advocate for/interact with underserved and vulnerable communities/populations | No | |
| Social media | Yes | |

Local knowledge and experience also contribute to community hazard awareness and preparedness. The City reports that community members have long relied on experience with earthquakes, tsunamis, volcanic activity, high winds, heavy rainfall, and coastal storms. Specific practices associated with this knowledge were not documented during this plan update and may be further identified through future community engagement.

Community partnerships provide another source of local resilience. The City reports that Trident Seafoods has supported Akutan during emergencies, including the COVID-19 pandemic, by providing personnel, equipment, vessels, and helicopters to assist emergency response and maintain access when normal transportation is disrupted.

# B.6 Mitigation Strategy

## B.6.1 Mitigation Goals

The City of Akutan's mitigation goals are:

1. Reduce potential snow avalanche vulnerability, damage, and loss.
2. Reduce potential dam failure vulnerability, damage, and loss.
3. Reduce potential earthquake vulnerability, damage, and loss.
4. Reduce potential flooding, coastal erosion, and shoreline instability vulnerability, damage, and loss by protecting critical infrastructure, utilities, transportation corridors, and community facilities.
5. Reduce potential landslide vulnerability, damage, and loss.
6. Reduce potential severe weather vulnerability, damage, and loss.
7. Reduce potential tsunami vulnerability, damage, and loss.
8. Reduce potential volcano vulnerability, damage, and loss.
9. Reduce potential wildland fire vulnerability, damage, and loss.

## B.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

The City of Akutan reviewed mitigation actions identified in the 2021 AEB HMP and provided a status update for each action.

- ***Completed***- this action has been completed
- ***In Progress/Ongoing***- this action has been started is currently in-progress or ongoing
- ***Not Started***- this action has not been started

| ID | Action | Status |
|---|---|---|
| **1** | Identity buildings and facilities that must be able to remain operable during and following an earthquake event. | Completed |
| **2** | Consider participation in the Tsunami Awareness Program. | In Progress/Ongoing |
| **3** | Install a second tsunami siren. | Not Started |
| **4** | Replace Tsunami Shelter. | Complete |
| **5** | Conduct special awareness activities, such as Winter Weather Awareness Week. | Not Started |
| **6** | Improve City Dock. | In Progress/Ongoing |
| **7** | Update, as needed, emergency notification procedures and emergency planning for ash fall events. | Not Started |
| **8** | Evaluate water treatment plant to ensure that ashfall can't enter the system. | Not Started |
| **9** | Protect water source and transmission line. | In Progress/Ongoing |
| **10** | Erosion is occurring near housing by the Library/ Recreation Center. Mitigate Erosion. | In Progress/Ongoing |

### B.6.3 2027 Mitigation Action Plan

**Table B-6- 2027 Mitigation Action Plan- City of Akutan**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | Cryosphere - Snow Avalanche<br>Ground Failure/ Landslide | Partner with agency/outside entity to do formal mapping of avalanche and landslide hazard zones. | M | Administration Department | HMA, USACE, Alaska DHS&EM EMPG, Denali Commission, USGS EHP, HUD CDBG, DGGS, University | Other | Critical Facilities in Avalanche Areas | 3-4 years | B/C: Mapping supports cost-effective mitigation; moderate study costs.<br>TF: Identification of funding/TA partner and scoping of mapping project needed. | Existing Plans: Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **2** | Cryosphere - Snow Avalanche<br>Ground Failure/ Landslide | Develop and share a local hazard zone map to identify where people, buildings, roads, and utilities may be at risk. | H | Administration Department | City, APIA, HMA, Alaska DHS&EM EMPG, Denali Commission, HUD CDBG | Other | Critical Facilities in Avalanche Areas | 0-2 years | B/C: Low-cost mapping yields high-benefit information for future projects.<br>TF: Scope can be adjusted based on available capacity and funding and used to inform more in-depth future mapping. | Existing Plans: Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **3** | Cryosphere - Snow Avalanche<br>Ground Failure/ Landslide | Install warning signage in known avalanche and landslide zones. | L | Administration Department | City, HMA, Denali Commission, Alaska DHS&EM EMPG | Education and Awareness Programs | Relevant Critical Facilities such as Roads and Buildings | 5-10 years | B/C: Very low-cost life-safety improvement.<br>TF: Phase with avalanche and landslide zone mapping. | Existing Plans: Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **4** | Dam Failure | Develop Dam Emergency Action Plan (EAP) for the Akutan Hydro Dam in the event of a dam failure. This would include identifying homes, roads, bridges, buildings, and critical facilities that could be affected by flooding following a dam failure and implement mitigation plans/procedures for affected residents & infrastructures | H | Administration Department | HMA, USACE, Alaska DHS&EM EMPG, Denali Commission, ANTHC | Plans and Regulations | Akutan Hydro Dam, Critical Facilities in inundation zones | 0-2 years | B/C: High life-safety benefit; cost low for planning compared to risk reduction.<br>TF: Phased funding for planning and studies to determine feasibility of implementation. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan, Local Emergency Operations Plan |
| **5** | Dam Failure | Complete formal dam breach inundation mapping of the Akutan Hydro Dam to determine risk. | H | Administration Department | HMA, USACE, Alaska DHS&EM EMPG, ANTHC | Other | Akutan Hydro Dam | 0-2 years | B/C: Mapping informs cost-effective mitigation; modeling requires technical expertise.<br>TF: Phased funding likely not needed for dam inundation mapping. | Existing Plans: Comprehensive Plan, Stormwater Management Plan, Land Use Plan, Local Emergency Operations Plan |
| **6** | Dam Failure | Consider mitigation measures to protect critical facilities that are in the estimated dam inundation area. | M | Administration Department | HMA, USACE, Alaska DHS&EM EMPG, Denali Commission | Structure and Infrastructure Projects | Critical Facilities in Estimated Dam Inundation Area | 3-4 years | B/C: Prevents severe losses; cost depends on facility-specific solutions.<br>TF: Phased funding for assessments and engineering solutions. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan, Local Emergency Operations Plan |
| **7** | Earthquake | Identify buildings and facilities that must be able to remain operable during and following an earthquake event. Assess strategies to harden or otherwise make these facilities more resilient to seismic events. | M | Administration Department | City, HMA, Denali Commission, Alaska DEC CDBG, USGS EHP | Other | N/A | 0-2 years | B/C: Identifying priority facilities is low-cost and improves future retrofit cost-effectiveness.<br>TF: Potentially eligible for phased planning under BRIC, HMGP, and EMPG. | Existing Plans: Akun Airport Operations Plan, Akun Airport Development Scenarios, other Continuity of Operations Plans, Local Emergency Operations Plan |
| **8** | Earthquake | Identify additional buildings (such as on Akun Island) that should be equipped with generators and emergency supplies in order to reduce the risk of secondary impacts from earthquakes. | H | Administration Department | City | Other | N/A | 0-2 years | B/C: Backup power is highly cost-effective for critical services; costs vary with generator size and logistics.<br>TF: Phased assessment and then procurement. | Existing Plans: Akun Airport Operations Plan, Akun Airport Development Scenarios, other Continuity of Operations Plans, Local Emergency Operations Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **9** | Flood | Install permanent water-level gauges and wave buoys to monitor coastal conditions and improve flood and storm warning systems. | H | Administration Department | NOAA/NWS, HMA, USACE, USGS CMHP, Denali Commission, Alaska DHS&EM EMPG, AOOS | Other | Monitoring Infrastructure | 0-2 years | B/C: Improves early warnings and reduces damages; costs moderate with ongoing O&M. TF: Partnerships and regional monitoring models likely to help with funding and implementation. | Existing Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **10** | Flood, Sediment Deterioration and Land Destabilization, Cryosphere - Sea Ice | Implement the erosion mitigation plan (PND studies) at the location of the Library/Recreation Center. | H | Administration Department | HMA, USACE, Denali Commission, ANTHC | Structure and Infrastructure Projects | Library, Recreation Center | 0-2 years | B/C: Protects public facilities; cost driven by technical work, materials, and transportation. TF: BRIC/HMGP, USACE, and CDBG can possibly help fund phased implementation. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **11** | Flood, Sediment Deterioration and Land Destabilization, Cryosphere - Sea Ice | Evaluate and implement long-term erosion control measures to protect critical infrastructure. | M | Administration Department | HMA, USACE, Denali Commission, ANTHC | Structure and Infrastructure Projects | All | 5-10 years | B/C: Long-term controls reduce repetitive loss; initial costs can be high. TF: Multi-year phasing | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **12** | Flood, Sediment Deterioration and Land Destabilization, Cryosphere - Sea Ice | Evaluate storm damage on the bridge and fund upgrades to it, including measures to mitigate erosion of nearby sand dunes which increases the vulnerability of the bridge to washouts during severe storms on Akun Island. | H | Administration Department | HMA, USACE, Denali Commission, ANTHC | Structure and Infrastructure Projects | Bridge | 3-4 years | B/C: Bridge upgrades reduce isolation risk; costs depend on structural extent and dune stabilization. TF: Phased funding for assessment, design, and construction. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **13** | Sediment Deterioration and Land Destabilization | Address access issues and prevent damage to the tsunami shelter from erosion and landslides. | H | Administration Department | HMA, USACE, Alaska DHS&EM EMPG, Denali Commission, HUD CDBG | Structure and Infrastructure Projects | Tsunami shelter | 0-2 years | B/C: Maintains access and protects critical facility; stabilization costs vary. TF: Phased funding needed for assessments, engineering, design, and implementation. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan, Local Emergency Operations Plan |
| **14** | Sediment Deterioration and Land Destabilization, Cryosphere - Sea Ice | Seek funding to implement the mitigation measures recommendations by PND Engineers reduce possible impacts of erosion affecting homes and critical infrastructures of the City. The priority is addressing the erosion area near the Library. | H | Administration Department | HMA, USACE, Denali Commission, ANTHC | Structure and Infrastructure Projects | Homes and critical infrastructure | 0-2 years | B/C: Erosion mitigation prevents costly future damage; construction cost depends on design complexity. TF: The Tribe and City will need phase funding to obtain engineering and design expertise to determine project viability and then move into implementation funding. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **15** | Severe Weather | Conduct special awareness activities/programs, such as Winter Weather Awareness Week, with a focus on schools. | M | Administration Department | City, HMA, Alaska DHS&EM, NOAA/NWS E&O, American Red Cross, APIA | Education and Awareness Programs | N/A | 3-4 years | B/C: Low-cost, high-benefit public safety education. TF: Potential to do this in-house or identify small grant funding. APIA may be able to support outreach activities. | Existing Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **16** | Severe Weather | Utilize the assessment reports from insurance company and improve the City Commercial Dock so it is more resistant to severe weather and wave damage. | H | Administration Department | HMA, U.S. DOT PIDP, USACE, EDA, Alaska DOT&PF, Denali Commission | Structure and Infrastructure Projects | City Commercial Dock | 0-2 years | B/C: Mitigation targeted to documented damage is highly cost-effective. TF: Phased funding for engineering and implementing upgrades. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **17** | Severe Weather | Weatherproof electrical systems on critical infrastructure. | H | Administration Department | HMA, Denali Commission, U.S. DOE, Alaska DEC | Structure and Infrastructure Projects | All | 0-2 years | B/C: Prevents outages and equipment loss; costs vary by system. TF: Possible phased funding for assessments and procurement. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **18** | Severe Weather | New Boat Harbor - Make improvements to strengthen lighting and shore power (which was damaged due to weather). | H | Administration Department | HMA, U.S. DOT PIDP, USACE, EDA, Alaska DOT&PF, Denali Commission | Structure and Infrastructure Projects | New Boat Harbor | 0-2 years | B/C: Improves safety and reduces future storm damage; costs moderate. TF: Some harbor-specific infrastructure grants possible. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **19** | Severe Weather | Seek funding to develop weatherization program to help homes withstand high wind impacts and extreme cold. | H | Administration Department | HMA, HUD CDBG, DOE/AHFC Weatherization Programs, DOE/GRIP, BIA/HIP, RurAL CAP | Structure and Infrastructure Projects | Homes | 3-4 years | B/C: Weatherization lowers energy costs and reduces hazard damage; cost depends on number of homes. TF: May need to bring in technical consultants to develop weatherization program. | Existing Plans: Comprehensive Plan |
| **20** | Severe Weather | Secure funding to support shipping, installation, and specialty contractors to operate and implement new generators that are expected to be procured by the City. | H | Administration Department | HMA, Alaska DHS&EM EMPG, HUD CDBG, DOE/AHFC Weatherization Programs, DOE GRIP, Denali Commission, Alaska DEC | Structure and Infrastructure Projects | City Buildings | 0-2 years | B/C: Backup power has high reliability benefits; shipping/installation costs are significant. TF: Transportation costs and access considerations are difficulties for implementation | Existing Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **21** | Severe Weather | Address problems with the cooling system to ensure that it is functional and can withstand future hazard events. | H | Administration Department | HMA, Alaska DHS&EM EMPG, HUD CDBG, DOE/AHFC Weatherization Programs, DOE GRIP, Denali Commission, Alaska DEC, USACE | Structure and Infrastructure Projects | Cooling System | 0-2 years | B/C: Prevents severe losses; cost depends on facility-specific solutions. TF: The Tribe and City will need phase funding to obtain engineering and design expertise to determine project viability. | Existing Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **22** | Severe Weather | Assess strategies to strengthen electrical systems in order to reduce the number of power outages. | H | Administration Department | HMA, DOE GRIP, Denali Commission, ALaska DHS&EM EMPG, USDA RD | Structure and Infrastructure Projects | All | 5-10 years | B/C: Assessment is low-cost and informs future cost-effective projects. TF: Planning grants may be available. Window to fly out engineers is weather-dependent. | Existing Plans: Comprehensive Plan, Capital Improvements Plan |
| **23** | Severe Weather | Perform generator upgrades and backup power for critical facilities in order to reduce the number of power outages. | H | Administration Department | HMA, DOE GRIP, Denali Commission, ALaska DHS&EM EMPG, USDA RD | Structure and Infrastructure Projects | All | 5-10 years | B/C: Upgrades and backup power prevent cascading impacts of power outages. TF: Phasing of upgrades with prioritization of critical facilities. | Existing Plans: Comprehensive Plan, Capital Improvements Plan |
| **24** | Tsunami | Consider participation in the Tsunami Awareness Program. | H | Administration Department | City | Education and Awareness Programs | All | 0-2 years | B/C: Low-cost preparedness improvement. TF: Phased funding likely not required. | Existing Plans: Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **25** | Tsunami | Check that the tsunami siren is working properly, and if needed, do repairs or install a second tsunami siren. | H | Administration Department | City, HMA, Alaska DHS&EM, DHS/FEMA PSGP, Denali Commission | Structure and Infrastructure Projects | Tsunami Siren | 0-2 years | B/C: High life-safety benefit compared to cost of installation. TF: Phased funding depending on need for repairs versus new siren. | Existing Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **26** | Tsunami | Upgrade the tsunami shelter with equipment such as backup generators, batteries, flash lights, food supplies so it can safety serve residents during an emergency. | H | Administration Department | City, HMA, Alaska DHS&EM EMGP, HUD CDBG, Denali Commission, USDA RD | Structure and Infrastructure Projects | Tsunami shelter | 0-2 years | B/C: Shelter readiness provides major life-safety benefits; supply costs manageable. TF: Inventory of needed equipment prior to funding for procurement. | Existing Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **27** | Tsunami | Install a separate, back-up generator at the tsunami evacuation shelter. | H | Administration Department | City, HMA, Alaska DHS&EM EMGP, HUD CDBG, Denali Commission, USDA RD | Structure and Infrastructure Projects | Tsunami shelter | 0-2 years | B/C: Ensures reliable power; costs tied to generator size and installation. TF: Phased funding likely not needed, however procurement and installation may need separate funding sources. | Existing Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **28** | Volcano | Review and update emergency notification and response procedure for volcanic ashfall and share the information effectively with residents - social media is widely used by residents. | M | Administration Department | City, APIA, HMA, Alaska DHS&EM EMPG, Denali Commission, USGS EHP | Plans and Regulations | All | 0-2 years | B/C: High-benefit communication improvement at low cost. TF: Phased funding for review and outreach activities. | Existing Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **29** | Wildfire | Assess and manage vegetation around critical infrastructure. | H | Administration Department | HMA, Alaska DHS&EM | Other | All | 3-4 years | B/C: Relative low cost of assessment and fuel reduction for wildfire mitigation benefit. TF: Phased implementation for assessment and management strategies specific to local vegetation and resources. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan, Local Emergency Operations Plan |
| **30** | Wildfire | Community fire prevention education in collaboration with the City, Trident, Corporation, and the Tribe. | H | Administration Department | HMA, USDA, APIA, City, Alaska DHS&EM, Alaska CASC, University of Alaska | Education and Awareness Programs | All | 0-2 years | B/C: Low cost, high impact strategy especially with strong partnerships. TF: Using existing education materials and leveraging partnerships can increase reach, efficiency, and impact. Programs can be delivered seasonally or annually. | Existing Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan, Local Emergency Operations Plan |

### B.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Update, as needed, emergency notification procedures and emergency planning for ashfall events. | Not complete and not a priority at this time. |
| Evaluate water treatment plant to ensure that ashfall can't enter the system. | Water treatment plant is in good condition and this is not a priority at this time. |
| Protect water source and transmission line. | Completed and all operating well. |
| Erosion is occurring near housing by the Library/Recreation Center. Mitigate Erosion. | Hired a consultant to do an erosion control study and the Planning Team identified alternate mitigation projects taking into consideration these recommendations. |
| Conduct coastal flood assessment to identify flood-prone areas and vulnerable facilities. | Consultant is completing and erosion control study which will include this kind of finding. |
| Protect the fuel line on Akun from cattle, as a break could spill into a salmon stream. | The Planning Team decided that this does not necessarily mitigate risk from an identified natural hazard and it can be addressed in the near-term with fencing/stakes. |
| Mitigation project to address the hazardous operation of refueling on Akun Island. | The Planning Team decided not to include a project about this at this time. |

# B.7 Plan Update

## B.7.1 Changes in Development, including in Hazard-Prone Areas (Current and Future)

### B.7.1.1 Changes in Development Since 2021

Since the 2021 HMP, the City has initiated building a new Tsunami Shelter project. The Tsunami Shelter provides a modern, safe refuge during tsunami and severe weather events, while the identification and update of critical facilities through the 2027 HMP process strengthens emergency response planning and continuity of operations, the completion of this project helps to reduce risks to residents and improve the City's ability to respond to natural hazards.

Overall, the City's vulnerability has decreased in some areas but increased in others. Significant investment such as the new Tsunami Shelter, ongoing infrastructure improvements, and updated emergency planning has improved community resilience. However, coastal shoreline loss has become a higher priority due to documented shoreline loss affecting public infrastructure, utilities, and community facilities. Future/Planned Development

No future or planned developments were reported by the Planning Team.

## B.7.2 Changes in Priorities and Mitigation Efforts

The Planning Team has adjusted priorities to focus on shoreline loss affecting public infrastructure, utilities, and community facilities. Increased attention is also being given to climate-related impacts, severe weather, and coastal flooding. As a result, while preparedness has improved, new and evolving hazards continue to require mitigation efforts.

# B.8 Plan Maintenance

## B.8.1 Planning Team MJHMP Maintenance Commitment

The City of Akutan is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.6.

The City of Akutan is committed to annually reviewing the Plan and City staff will work to complete their review responsibilities.

## B.8.2 Continued Public Involvement

The City of Akutan is dedicated to continued public involvement over the next five years.

The City of Akutan will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2031.

Future engagement should also provide opportunities for community members to identify new local observations, environmental changes, subsistence-related impacts, traditional access concerns, and other locally relevant knowledge that may affect hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where community-provided or Indigenous Knowledge is considered for incorporation into the MJHMP, appropriate attention should be given to community review, attribution, sensitivity, and preferences regarding public disclosure.

## B.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The City of Akutan jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The City Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### B.8.3.1.1 Implementing

Upon adoption of the Plan, the City of Akutan will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The City will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### B.8.3.1.2 Monitoring

The City of Akutan will monitor the progress of mitigation actions on an annual basis. The City Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### B.8.3.1.3 Evaluating

The City of Akutan will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

Annual reviews should also consider whether new Indigenous Knowledge, local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

#### B.8.3.1.4 Updating

The City of Akutan will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.6(c)(4)(i). The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Figure B-31 provides a visual of the HMP plan maintenance activities per year.

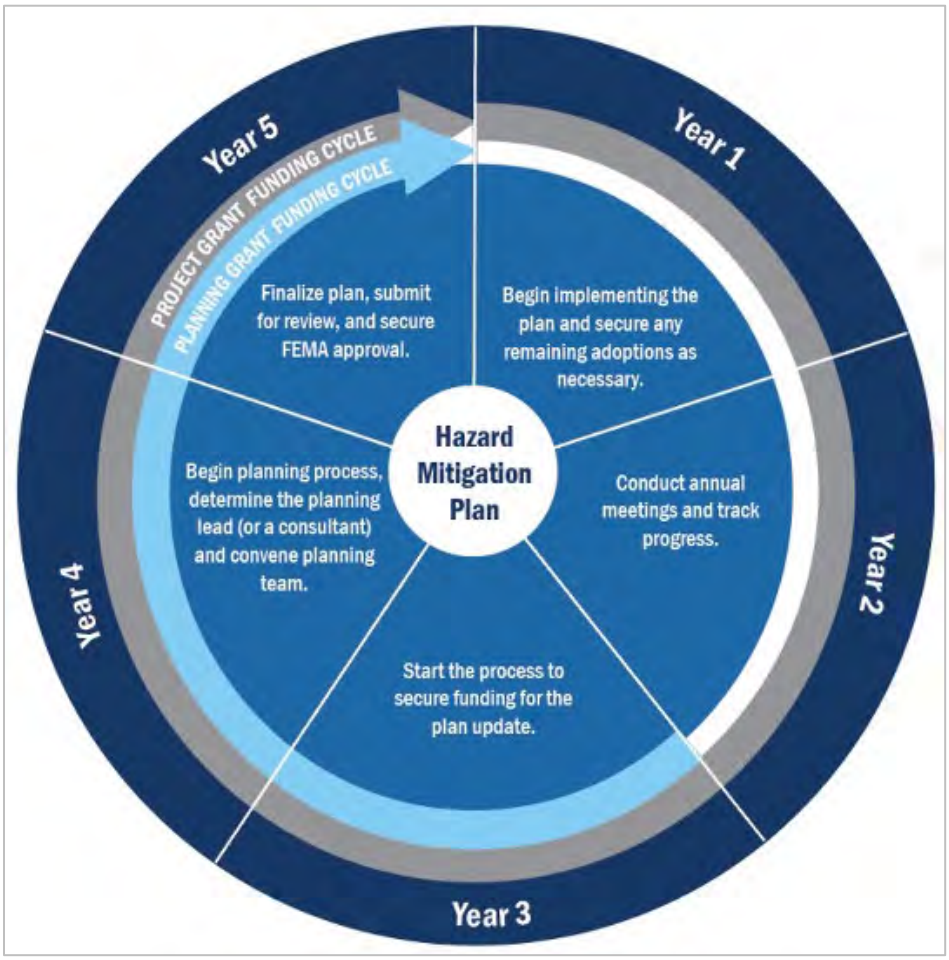



**Figure B-31- HMP Update Schedule**

### B.8.4 Plan Integration

The City of Akutan will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other planning and implementation processes, when appropriate.

The City will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the City's comprehensive and land use planning processes, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects.

As the plan is implemented, the City of Akutan will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## B.9 Plan Adoption

The City of Akutan City Council formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

[insert signed adoption resolution]

# C. Native Village of Akutan



Photo Credit: Maritime Helicopters

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# C.1 Planning Team and Tribal Definition of Public

## C.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Ivy Pelkey** | Tribal Administrator/Environmental Director |
| **Haliehana Stepetin** | Grant Writing Director |
| **Joseph Bereskin** | Akutan Traditional Council President |
| **Lydia Vincler** | Akutan Traditional Council/Elder Representative |
| **Mikita Shangin** | Office Clerk |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

## C.1.2 Tribal Definition of Public

For purposes of public involvement in the HMP Update planning process, the Native Village of Akutan defines the “public” as anyone living or working in Akutan, including individuals who are not enrolled members of the Native Village of Akutan Tribe. The public also includes Tribal members enrolled in the Native Village of Akutan Tribe who do not currently reside in Akutan.

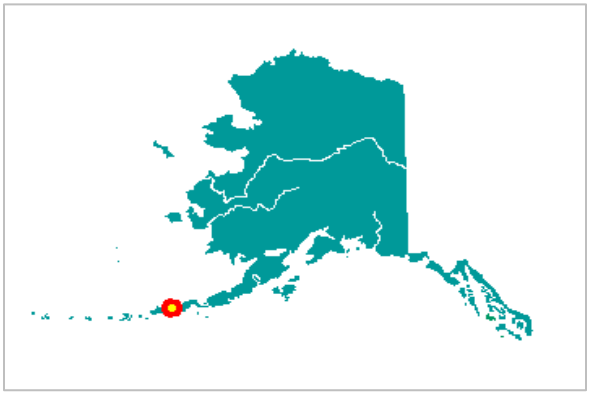
This definition ensures that anyone who lives or works within the community, as well as enrolled Tribal Members residing outside the community, is eligible to attend and participate in the public involvement portion of the HMP Update planning process.

# C.2 Community Profile

## C.2.1 Location and Geography

The Native Village of Akutan is located 766 air miles southwest of Anchorage and 35 miles east of Unalaska and is one of the Krenitzin islands within the Fox Island group, located at approximately 54.1338º north latitude and -165.7768º west longitude.

## C.2.2 History



The Native Village of Akutan is located on Akutan Island, on the site of a traditional Unangan village. The Unangax̂ place name for Akutan village is Achan-Ingiiga, which means where the salmon berries grow. As a modern townsite, it was founded in 1878 as a fur storage and trading port for the Western Fur and Trading company. The company's agent established a commercial cod fishing and processing business that quickly attracted nearby Unangan to the community. A Russian Orthodox church and a school were built in 1878. Alexander Nevsky Chapel was built in 1918 to replace the original structure. After the banning of sea otter hunting in 1911, The Pacific Whaling Company built a whale processing station across the bay from Akutan in 1912. It was the only whaling station in the Aleutians and operated until 1939, when it closed due to market pressures. Commercial cod fishing continued, following the closure of the whaling station. After the Japanese attacked Unalaska in June 1942, the United States government evacuated Akutan residents to the Ketchikan area. The community was re-established in 1944, although many residents chose not to return. Despite the disruption of relocation, war-time damage from U.S. military occupation, and re-population with a much smaller population, the fisheries industry flourished following the war. The community was officially incorporated in 1979.

## C.2.3 Population

The 2020 decennial census recorded a population of 1,589. The DCRA community profile states that roughly 75 people in total are year-round residents, while the difference is seasonal and transient workers. Similarly, the 2024 American Community Survey Demographic and Housing Estimates recorded a total population of 649 with a margin of error of ±273.

## C.2.4 Demographics

The tribal demographics of the Native Village of Akutan are majority Alaska Native but not enough data exists to determine the demographics of tribal members of two or more races.

For the whole geography of Akutan, though the population estimates vary significantly between sources, the 2024 ACS reports a demographic composition of 27.8% White alone, 13.5% Black or African American alone, 21.5% American Indian and Alaska Native alone, 16.4% Asian Alone, and 14% of some other race, with 6.8% of the population reported as two or more races. 16.1% of the population identifies as Hispanic or Latino, and 63.9% of the population speaks a language other than English in the home.

## C.2.5 Economy

Since the modern founding of the community of Akutan, the economy of the region has centered on the harvest of wildlife. Initially, the harvest focused on fur trapping and storage; but this quickly shifted to commercial fisheries. After the banning of sea otter hunting in 1911, The Pacific Whaling Company built a whale processing station across the bay from Akutan in 1912. It was the only whaling station in the Aleutians and operated until 1939, when it closed due to market pressures. Commercial cod fishing continued,

following the closure of the whaling station. Following the close of World War II, the community started its recovery and repopulation. The fisheries industry flourished in the late 40s, supporting 13 floating processors and employing the local population. In the 1980s, the crab industry declined; but Trident Seafoods assumed management of an existing shore-based plant, processing mostly frozen pollock. Trident has been an APICDA partner since 1992, supporting economic development in the community. However, Akutan residents tend not to work in the plant itself and instead hold support positions for the facility. Additionally, Trident Seafoods is building a replacement facility in Unalaska which would serve as the replacement for the Akutan facility.

Other local employment is limited. As of 2012, only seven local residents held commercial fishing licenses. Non-fishing employment include government positions, boat piloting, local service industry, diving, and halibut or cod/finfish permitted fishing. There have also been investments and discussions on development of mariculture farms supporting mussels, abalone, and oysters as well as improvements made to Akun island to support cattle farming. As of 2012, there were roughly 1,000 head of cattle on the island.

In addition to the current local employment opportunities, in 2012 and 2013 respectively the Akutan airport on Akun Island and a public dock and mooring basin opened, opening the community to greater transportation. The main employers in the community are Trident Seafoods, City of Akutan, Aleutian East Borough School District, Native Village of Akutan, and Akutan Corporation.

Subsistence harvesting also contributes to household food supplies and complements the community's longstanding relationship with local fisheries and marine resources.

## C.2.6 Land Use

Due to the provisions of the ANCSA, the regional and village Native Corporations received title to property in their traditional lands. The Akutan Corporation holds title to significant surface lands while The Aleut Corporation holds title to the subsurface resources.

As an incorporated 2nd class city, Akutan has the ability but not the requirement to enact and enforce planning, platting, and land use regulation. Title 8 of the Akutan Municipal Code covers these responsibilities.

Title 8 establishes the Planning Commission, made up of five residents representing five separate interests: the city, the public, the Traditional Council, fisheries, and the Akutan Corporation. These members are chosen for three-year terms by the mayor, who also serves as an ex-officio voting member. The commission is led by a chair and vice-chair elected by members of the commission itself. This commission has the power to produce zoning maps, investigate and address variance requests, and produce 5-year development plans for the city, among other related powers.

## C.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following community-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **1982 City of Akutan Comprehensive Plan** | Provides details on the overall vision for the City, including historical photographs. | Used relevant information to develop the Community Profile. |
| **2005 City of Akutan Community Plan** | Provides details on the history, economy, land use, critical facilities, and local/regional partners in Akutan | Used relevant information to develop the Community Profile. |
| **2007 Akutan Capital Projects** | List of capital projects the City was planning to complete | Reviewed list of past projects for suggestions in the Mitigation Action Plan |
| **2026 PND Akutan Beach Erosion Mitigation Project August 2026 Project Update** | Current status of the Project, items completed and remaining to be completed | Used current condition assessment and photos in the Sediment Deterioration and Land Destabilization hazard profile |

Source: State of Alaska Community Plans Library, City of Akutan/PND Engineers

# C.4 Risk Assessment

## C.4.1 Hazards

The Native Village of Akutan Planning Team identified the following natural hazards that may impact their geography/community.

✓ Hazard profiled for this jurisdiction in the MJHMP Update
X Hazard not profiled for this jurisdiction in the MJHMP Update

X Changes in the Cryosphere- Sea Ice
✓ Changes in the Cryosphere- Snow Avalanche
✓ Dam Failure
✓ Earthquake
✓ Flood
✓ Ground Failure/Landslide
✓ Invasive Species
✓ Land Destabilization
✓ Severe Weather
✓ Tsunami
✓ Volcano
X Wildland Fire

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere- Sea Ice | Did not profile this hazard | | |
| Cryosphere- Snow Avalanche | 2- Possible | 4- Catastrophic | Akutan is vulnerable to avalanches due to its steep and rugged mountainous terrain, heavy snowfall, strong winds, and rapidly changing winter weather conditions. Avalanches can occur on steep slopes and may be triggered by heavy snowfall, wind loading, rain, warming temperatures, or seismic activity.<br>Due to a lack of LiDAR data, or other forms of mapping, avalanche hazard areas and risk in Akutan are not well defined.<br>The Planning Team reports that an avalanche occurred on March 20th, 2012, on a hillside, impacting houses below. This avalanche completely covered the backside of two houses. Members of the community had to shovel out the windows so the pressure wouldn't break the windows. |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485 mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and Akutan itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration | 3- Likely | 2- Limited | Sediment deterioration and land destabilization can occur throughout Akutan, with coastal land destabilization being the biggest concern for the |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| and Land Destabilization | | | community. Since Akutan is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.<br>Riverine land destabilization isn't identified as a concern for the community.<br>At the beginning of 2026, PND Engineers began the "Akutan Beach Erosion Mitigation Project" in the community. This Project consists of collection and analysis of existing data, a site visit, community meeting, shoreline mitigation measures assessment, and hydrodynamic modelling (PND Engineers 2026). |
| Flood | 3- Likely | 4- Catastrophic | The Planning Team reports that low-lying waterfront areas in Akutan have experienced coastal flooding, storm surge, and high tides.<br>The Planning Team reports that low-lying waterfront areas are most impacted by storm events, including infrastructure such as the Akutan Library and residential homes. |
| Ground Failure/ Landslide | 2- Possible | 4- Catastrophic | Akutan is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity. |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of Akutan is susceptible to severe weather events and impacts. The Planning Team reports experiencing coastal storms, dense fog, and high winds. |
| Tsunami | 3- Likely | 4- Catastrophic | Akutan is located on Fox Island. Most infrastructure is at an elevation of approximately 98 feet above sea level. According to FEMA's National Risk Index, the tsunami risk for Akutan is Relatively Moderate. According to the State of Alaska DHS&EM, Akutan has local tsunami potential and a medium risk of distant tsunami potential.<br>Formal tsunami inundation mapping for Akutan was completed in 2015. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of Akutan is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Akutan.<br>Volcanic ashfall is the primary volcanic hazard that may impact Akutan. |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | Akutan is located in relatively close proximity to Mount Akutan, which has produced large eruptions over the past century, and has averaged an eruption approximately every four years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, Akutan has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community. The notable exception occurred in 1962, when an eruption from Mount Akutan impacted the community with a thick layer of ash covering the community boardwalk that required it to be swept (AVO 2026). |
| Wildland Fire | 2- Possible | 3- Critical | Akutan has a relatively low wildfire risk compared with many areas of mainland Alaska because of its cool, wet maritime climate and limited forested vegetation. However, wildfires can occur in grass, tundra, brush, and other available fuels, particularly during periods of dry weather, warm temperatures, and strong winds.<br>The Planning Team is concerned about the potential for a fire to spread and become dangerous given the proximity of houses in the community. In the past, wildfires have largely resulted from manmade influences (debris burning/ incineration, in particular). During summer seasons, however, these wildfires present a severe hazard to houses. Since houses are so close together, made from wood, and connected via wooden boardwalk, the risk to human life and property damage is high. |
| Dam Failure | 2- Possible | 3- Critical | There is one (1) Significant Hazard Potential Dam in Akutan. The Akutan Hydro Dam, also known as the Town Creek Hydroelectric Dam, is owned by the City of Akutan.<br>There has not been a history of dam failures from the Akutan Hydro Dam.<br>Formal dam failure inundation mapping is not available for the Akutan Hydro Dam. |
| Invasive Species | 3- Likely | 2- Limited | The entire natural area surrounding Akutan is vulnerable to the spread of invasive species, particularly terrestrial invasive plants and invasive rats. Akutan's location adjacent to a busy coastal port is the primary human-caused pathway in the spread of invasive species in the region. |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | Although damages to the lands surrounding Akutan from invasive species has been limited, there are several non-native plants with a high invasiveness that have occurred near the community, including Creeping Buttercup, Italian Ryegrass, and Tall Buttercup.<br>Akutan is considered to have an established population of invasive Norway rats. |

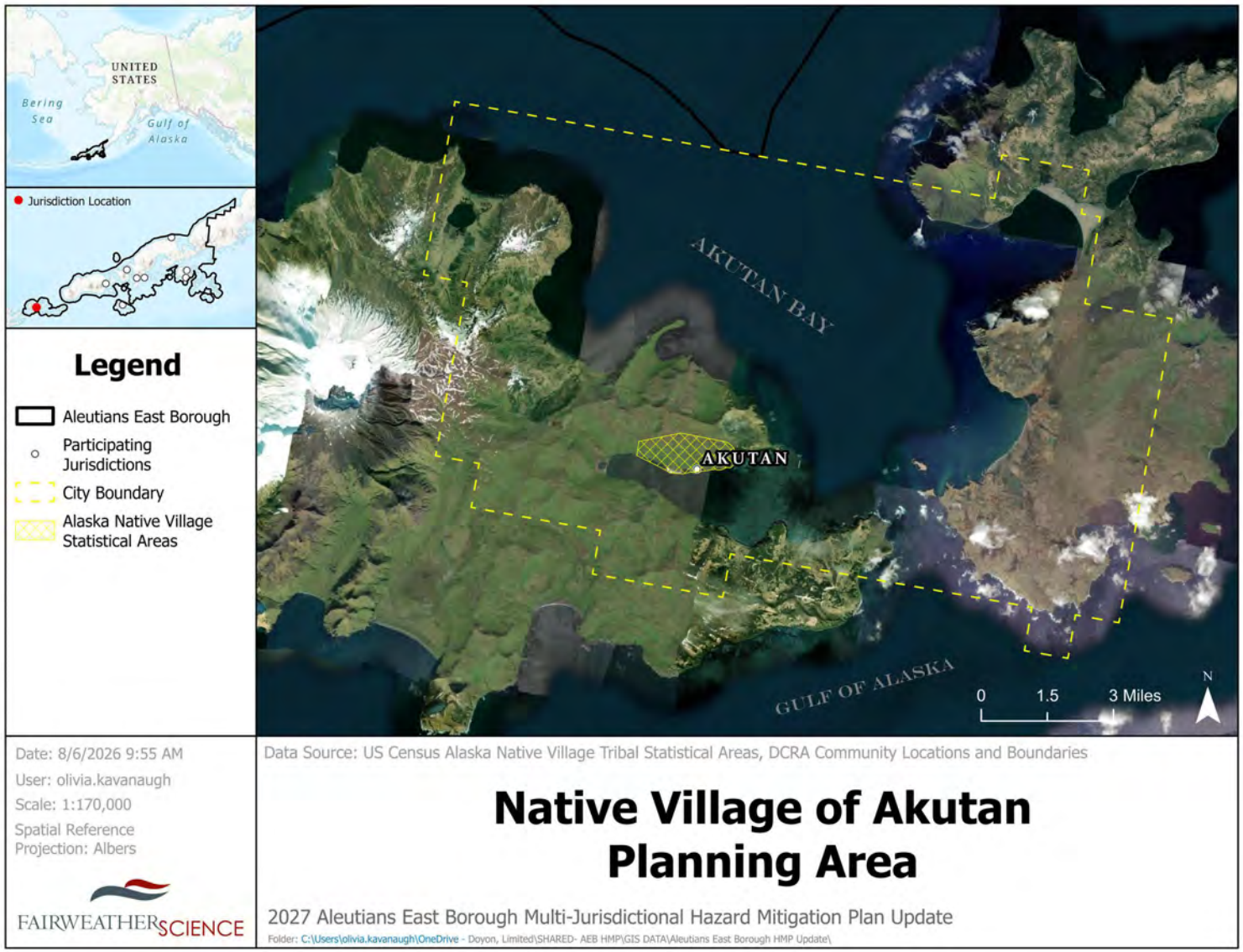



**Figure C-1- Native Village of Akutan Planning Area**

#### C.4.1.1 Changes in the Cryosphere- Sea Ice

The Native Village of Akutan Planning Team did not select this hazard to be profiled in the MJHMP Update.

### C.4.1.2 Changes in the Cryosphere- Snow Avalanche

#### C.4.1.2.1 Location

The Native Village of Akutan Planning Team reports that snow avalanches sometimes occur in the winter in a location against the hillside where the houses are located.

As avalanche hazard areas are not well defined in the community and detailed terrain data, such as LiDAR, were not available, ArcGIS Pro basemaps, including satellite imagery, topographic maps, and terrain data, were used to identify mountainous areas, elevation, and observable slope characteristics.

Potential avalanche hazard areas were manually delineated based on these features (Figure ). Where available, photographs of the surrounding geography were also reviewed to confirm the presence of steep slopes and other terrain characteristics indicative of potential avalanche hazard.

***This assessment is intended to identify potential areas of avalanche hazard at a planning level. It is not a substitute for site-specific avalanche hazard mapping, geotechnical investigations, or detailed evaluation of local topography, snow conditions, and site-specific conditions. Areas identified through this assessment should be considered preliminary and should be subject to further investigation where development or other activities may be exposed to avalanche hazards.***

A preliminary volcano hazard assessment for Akutan Volcano includes the approximate runout limit of debris avalanche produced by failure of the caldera rim.

The runout limit for an avalanche on Akutan Volcano does not threaten infrastructure or property in Akutan (USGS, 1998).

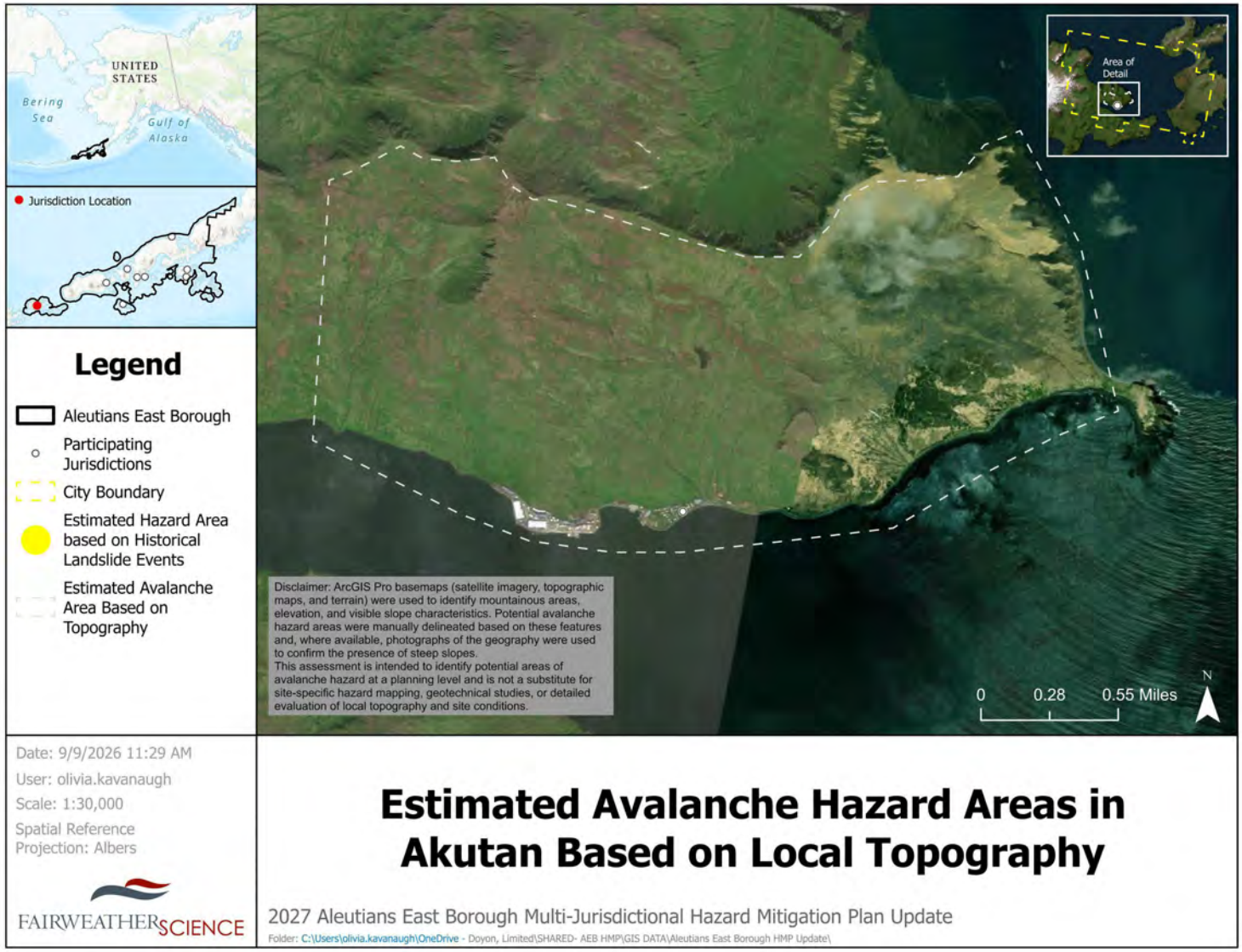
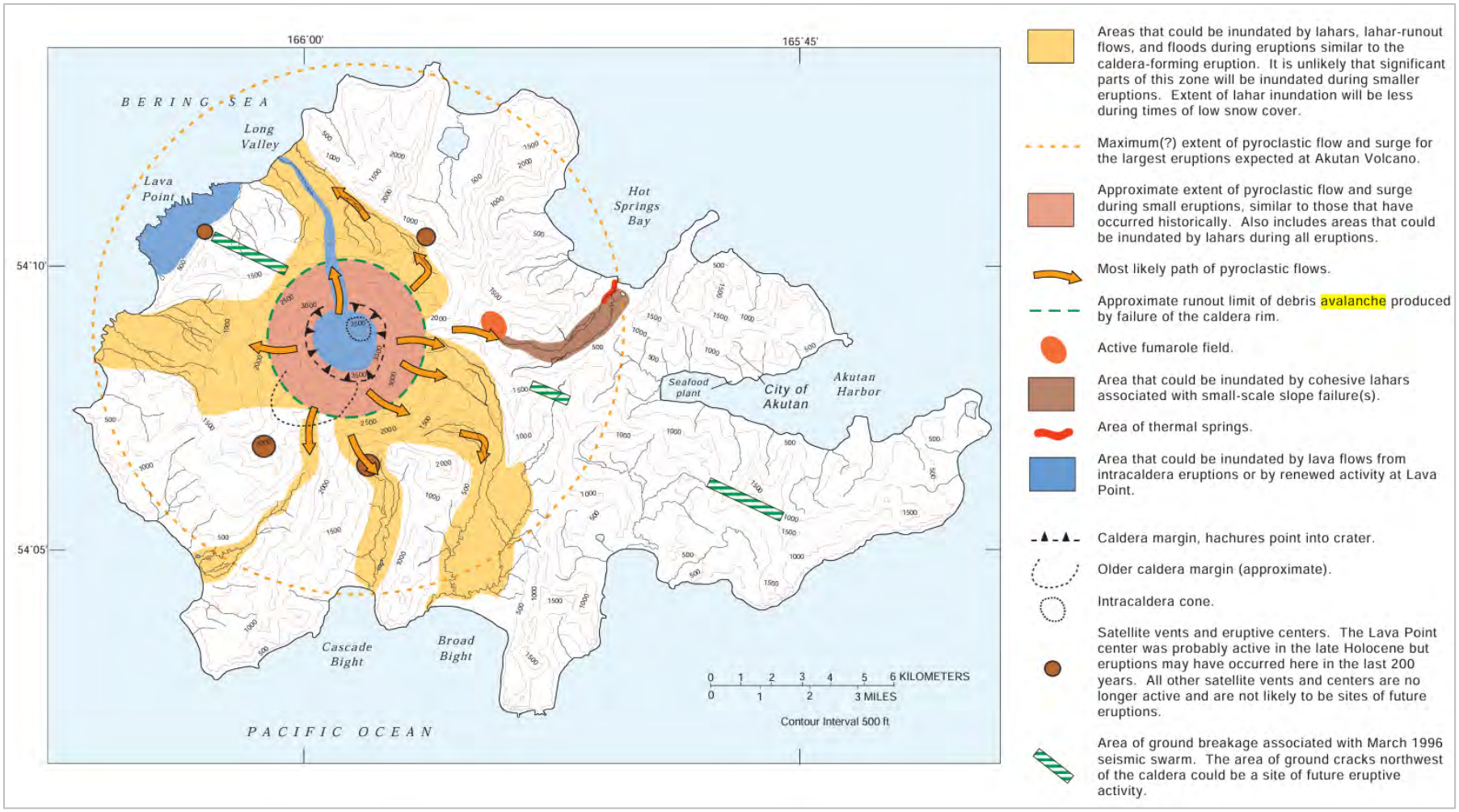



**Figure C-2- Estimated Avalanche Hazard Areas in Akutan Based on Local Topography**




Source: USGS, 1998

**Figure C-3- Preliminary Volcano-Avalanche Hazard Assessment for Akutan Volcano**

#### C.4.1.2.2 History

The Native Village of Akutan Planning Team reports that an avalanche occurred on March 20th, 2012 on a hillside, impacting houses below. This avalanche "completely covered the backside of two houses. They had to shovel out the windows so the pressure wouldn't break the windows."

This avalanche was reported in the Local Environmental Observer Network (LEO). The Planning Team also reports that Akutan historically received 10 - 12 foot snow drifts. These large snow drifts are much less common now.



Source: Photo courtesy of Bruce Wright for the LEO Network

**Figure C-4- Avalanche in Akutan, March 3, 2012 (1 of 2)**



Source: Photo courtesy of Bruce Wright for the LEO Network

**Figure C-5- Avalanche in Akutan, March 3, 2012 (2 of 2)**

#### C.4.1.2.3 Extent (Magnitude and Severity)

The snow avalanche in March 2012 resulted in 6+ feet of snow. The Planning Team also reports that Akutan historically received 10 - 12 foot snow drifts. These large snow drifts are much less common now.

Based on the extent of past snow avalanche events and the criteria identified in Table 5 of the Base Plan, the extent of a snow avalanche event in Akutan is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### C.4.1.2.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The Planning Team did not report previous impacts to geography/land from snow avalanches in Akutan. |
| Infrastructure | The Planning Team reported that two houses were partially buried by a snow avalanche on March 3rd, 2012 in Akutan. |
| People | The Planning Team reported that when two houses were partially buried by a snow avalanche on March 3rd, 2012, people needed to shovel out the snow so that the pressure would not break the windows. There are no specific reports of personal injury or death due to snow avalanches in Akutan. |

| | Description of Previous Impacts |
|---|---|
| Utilities | The Planning Team did not report previous impacts to utilities from snow avalanches in Akutan. |
| Transportation | The Planning Team did not report previous impacts to transportation from snow avalanches in Akutan. |
| Economy | The Planning Team did not report previous impacts to the economy from snow avalanches in Akutan. |
| Subsistence Resources | The Planning Team did not report previous impacts to subsistence resources from snow avalanches in Akutan. |

#### C.4.1.2.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Akutan will experience a snow avalanche event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### C.4.1.2.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of snow avalanche hazards in Alaska. |
| Location | It is possible future climate conditions will influence the location of snow avalanche hazards in Alaska. As warmer, wetter winters become more prevalent, heavy-snow avalanches may occur on different slopes that have not historically experienced avalanches. |
| Extent | Future climate conditions are likely to influence the magnitude and severity of avalanches. Avalanche activity is determined by several factors, including snowpack type, internal liquid volume, air temperature, precipitation, elevation, slope, ground cover, etc. An increase in liquid content within snowpack, from increased December-March air temperature and January-February increased precipitation, may lead to greater occurrence of wet snow avalanches, especially in late winter/early spring (Ballesteros-Canovas et al. 2018). |
| Impact | Future climate conditions are likely to influence the impact of avalanches. As snowpack experiences greater liquid volume, avalanche risk will increase (Ballesteros-Canovas et al. 2018). As snowpack retreats to higher elevations due to reduced snowpack and quickened melt, the impacted area will also shift upwards. Impacts in this scenario will likely be due to loss of water supply, affecting culture, wildlife resources, and tourism (IPCC 2018). Infrastructure in avalanche hazard zones may also be impacted by an increase in frequency and extent of wet snow avalanches. Damage to structures may vary depending on the impact pressure of the avalanches. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of future avalanche events in Akutan. Some studies suggest that a warming climate may increase avalanche risk due to changes in snow accumulation and moisture content, as well as loss of snowpack stability because of changing air temperature (DGGS 2023d). Ballesteros-Canovas et al. (2018) predicts an increase in avalanche activity in the 2nd half of the 21st century; largely wet-snow avalanches due to increased air temperature and precipitation. |

| Description of Future Conditions | |
|---|---|
| Population Patterns | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in Akutan. However, this is jurisdiction-dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in construction moving outside of avalanche zones. Due to the cost and difficulty of building in the Aleutian Islands, it is possible that if a home is damaged by an avalanche that the residents may move out of the community completely. |
| Land Use Development | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in Akutan. However, this is jurisdiction-dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in land use which promotes development outside of possible avalanche slide paths. |
| Subsistence Resources | Future climate conditions are not anticipated to influence subsistence resources as they relate to avalanche hazards. |

### C.4.1.3 Dam Failure

#### C.4.1.3.1 Location

There is one (1) Significant Potential Dam in Akutan. The Akutan Hydro (Town Creek Hydroelectric) Dam has a NID ID of #AK00264.

The Akutan Hydro (Town Creek Hydroelectric) is located north of the population center of Akutan, and uphill from the coastline approximately 760 feet. The dam is owned by the City of Akutan.

| NID ID #AK00264 Akutan Hydro Dam (Town Creek Hydroelectric Dam) | |
|---|---|
| Hazard Classification | Significant |
| Owner | City of Akutan |
| Year Built | 1993 |
| Dam Type | Earth |
| Dam Purpose | Hydroelectric |
| Length x Height | 200 ft x 21 ft |
| Drainage Area | Unknown |
| Inspection Frequency | The most recent inspection was June 20, 2018. Inspection frequency is every 3 years. |
| Downstream Description | The outflow of the dam creates a small creek, which flows downstream until reaching Akutan Harbor. The creek terminates after descending 760 feet of elevation over 0.75 miles. There is an access trail that parallels the creek, and multiple roads and infrastructure along the coastline, on both sides of the creek mouth. |
| Downstream Area | The downstream area consists of steep, sparsely vegetated land. There is no infrastructure besides an access trail until the creek reaches the coast, where there are numerous structures to the east and the west of the creek mouth. |
| Downstream Dams | There are no dams immediately downstream of Akutan Hydro Dam. |
| Downstream Bridges | There are two (2) bridges downstream of Akutan Hydro Dam. One allows the access trail to pass over the top of the dam. The second bridge is on the coastline, allowing the Boardwalk Road to cross over the creek. |
| Reservoir Area | Akutan Hydro Dam (Town Creek Hydroelectric Dam) has a maximum capacity of 20 acre feet and a surface area of 1.4 acres. The reservoir is approximately 460 feet long and 210 feet wide. |
| Downstream Development | The Akutan Hydro Dam outflow does not intersect any development (other than the access route) until the creek reaches the coastline. On the coastline, there is 21 structures within .25 miles of the Creek mouth – including the Trident Seafoods Plant. |
| General findings of the 2018 inspection | The condition assessment of the 2018 inspection found the Akutan Hydro Dam in Fair condition. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. Potential inundation of the access trail, permanent structures in the inundation area can happen. Due to the steep slope of the outflow, land destabilization could be anticipated during a dam break. |

| NID ID #AK00264 Akutan Hydro Dam (Town Creek Hydroelectric Dam) | |
|---|---|
| Recommended Hazard Potential Classification | The US Army Corps of Engineers, through the National Inventory of Dams, have classified this dam as Significant Hazard Potential. Due to the downstream development and potential loss of life, this recommendation is accurate and justified based on current classification guidelines. |

#### C.4.1.3.2 History

There is no history of dam failure in Akutan related to Akutan Hydro (Town Creek Hydroelectric) Dam.

#### C.4.1.3.3 Extent (Magnitude and Severity)

**Akutan Hydro (Town Creek Hydroelectric) Dam**

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

Figure  displays the potential inundation from an Akutan Hydro (Town Creek Hydroelectric) Dam failure.

Based on the extent of past dam failure events and the criteria identified in Table 5 of the Base Plan, the extent of dam failure events in Akutan is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

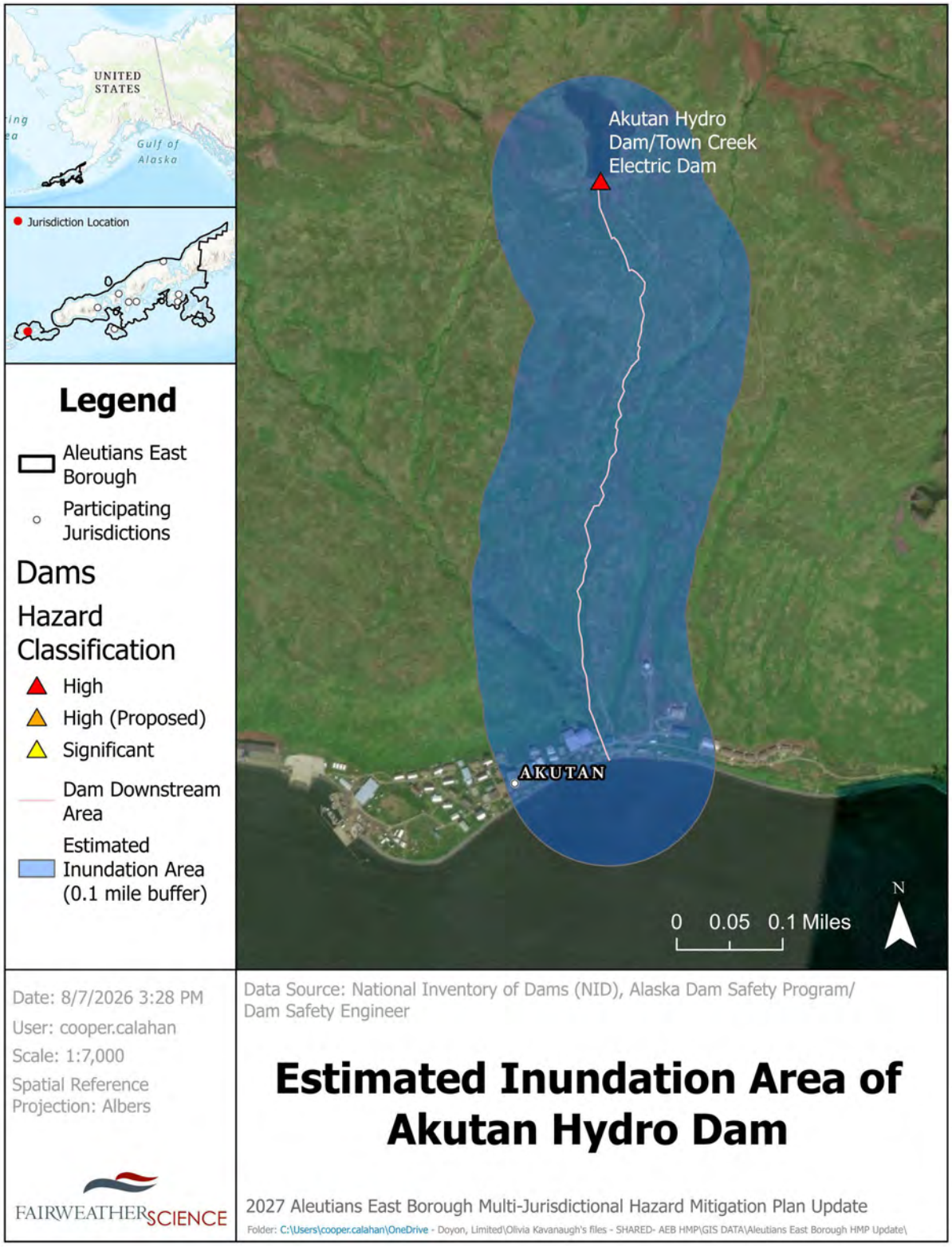



**Figure C-6 - Potential Dam Inundation of Akutan Hydro (Town Creek Hydroelectric) Dam**

#### C.4.1.3.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | There are no recorded impacts on the geography or land in Akutan due to dam failure. A dam failure could change the course of the downstream outflow creek and make the surrounding land more prone to ground failure or land destabilization. |
| Infrastructure | There are no recorded impacts on infrastructure due to dam failure in Akutan. Based on our assessment methodology of dam failure inundation zones, critical facilities downstream of the dam and within 0.1 miles of the outflow route could be inundated with flood water from a dam failure in Akutan.<br>Critical facilities at risk of dam inundation include the museum/library building, City Administration building, Day Care facility, Recreation Center, VPSO housing and jail, school, City Hall, Equipment warehouse, Water Storage Tank, Hydro Generator, Water Treatment Plant, Incinerator Building, and the Akutan Hydro Dam. |
| People | There have been no recorded impacts of injuries or fatalities due to dam failure in Akutan. Injuries due to swift water and/or drowning are possible during a future dam failure. |
| Utilities | There have been no recorded utility disruptions due to dam failure in Akutan. |
| Transportation | There have been no recorded impacts on transportations systems due to dam failure. In the event of a potential dam failure, no impact on air transportation is expected. Overland/trail travel up to the dam site may be impacted during a dam failure. The boardwalk may also be impacted by dam failure in Akutan. |
| Economy | There have been no economic impacts due to dam failure in Akutan. |
| Subsistence Resources | No specific reports of subsistence resources impacts due to dam failure have been reported in Akutan. |

#### C.4.1.3.5 Probability of Future Events

According to the Alaska Dam Safety Program:

> *Dam owners conduct routine monitoring and inspection of dams within the state on the previously identified schedule, with priority placed on those dams which pose the greatest potential threat. However, to fully determine the probability of a future event, a full engineering inspection would need to be completed on each dam, something beyond the scope of this program. The majority of these more thorough inspections are conducted by an independent agency hired by the dam owner, FERC, or the USACE.*
>
> *Dams undergoing repair and/or reconstruction are required to be designed to pass at least the 1%-annual-chance rainfall event with one foot of freeboard. The most critical and hazardous dams are required to meet a spillway design standard much higher than passing the runoff from a 1%-annual-chance rainfall event. Although not all the dams have been shown to withstand the 1%-annual-chance rainfall event, most of the dams meet this standard due to original design requirements or recent spillway upgrades.*

The probability for dam failure reduces when the dam is properly maintained and receives a “Satisfactory” condition rating.

Based on the criteria listed in Table 6 of the Base Plan and the most recent dam condition assessments, it is **Possible** that Akutan will experience a dam failure event in the calendar year; there is a less than 10% annual probability of occurring, where injuries and/or illnesses could result in temporary to permanent disability; with potential for critical facilities to be shut down for more than a week, and 10% of property would be severely

damaged. Failure depends on loading conditions (precipitation, seismic, deferred maintenance, vandalism, etc).

However, the State of Alaska Dam Safety Engineer warned of “condition creep”, where observational assessments of AEB dams have rated dams more poorly than their most recent available condition rating. If dams in AEB continue to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### C.4.1.3.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in Akutan. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in Akutan. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in Akutan. A potential outcome of changing climate in Alaska is an increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in Akutan. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in Akutan. Increased precipitation and frequency of severe weather events could contribute to more stress on the dam in Akutan. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in Akutan as residents may relocate in and out of potential future inundation areas. Residents of Akutan may also relocate out of Akutan Area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in Akutan. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted in inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in Akutan.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes.

### C.4.1.4 Earthquake

#### C.4.1.4.1 Location

All of Akutan is susceptible to earthquakes and their impacts because it sits directly above the Aleutian subduction zone. Akutan lies along the Alaska-Aleutian Megathrust, which is an active fault line spanning the length of the Aleutian chain where the Pacific Plate subducts into the mantle beneath the North American Plate. This seismically active region also contains smaller faults capable of producing earthquakes.

***According to the 2023 State of Alaska HMP, Akutan is located in an area with the potential of* Severe perceived shaking from earthquakes (34.0 – 65.0%g)** (Figure ). Perceived shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. This map focuses on the actual variations in shaking intensity across a region as felt by people and structures.

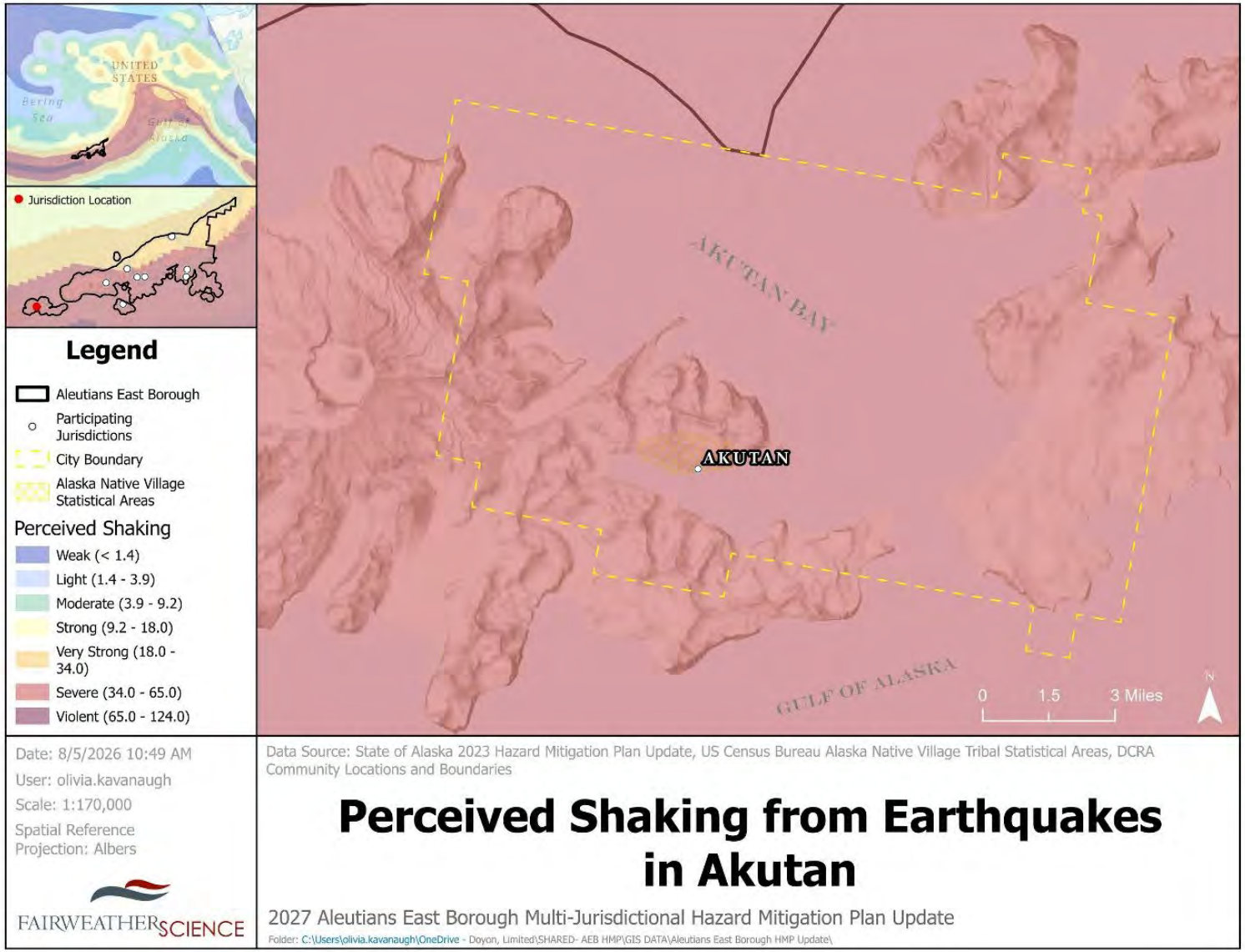



**Figure C-7 - Perceived Shaking from Earthquakes in Akutan**

#### C.4.1.4.2 History

Thousands of earthquakes occur each year along the Aleutian chain. Strong shaking has occurred historically in Akutan and can damage infrastructure and trigger tsunamis.

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

Please see Table 11 in the Base Plan for a list of historical earthquakes M6.0 and greater within the AEB Boundary. All earthquakes could possibly have resulted in perceived shaking in the Akutan.

#### C.4.1.4.3 Extent (Magnitude and Severity)

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding Akutan experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Based on the extent of past earthquake events and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in Akutan is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### C.4.1.4.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | There have been no recorded earthquake impacts on the geography or land in Akutan. An earthquake has the potential to trigger landslides, open cracks in the earth, and change the shoreline. |
| Infrastructure | While shaking has been perceived in Akutan, no reports of damage to buildings have been reported. A large earthquake could crack foundations and roadways and flatten buildings and other structures in the case of extremely severe earthquakes. |
| People | No injuries or fatalities due to earthquakes have been reported by the Native Village of Akutan Planning Team. Injuries or deaths are possible due to falling debris landing on individuals. |
| Utilities | There are no recorded impacts on utility systems due to earthquakes in Akutan. Earthquakes can damage sewer and water lines, and down utility poles. |
| Transportation | There is no recorded transportation system impacts due to earthquakes in Akutan. In the future, earthquakes could damage roadways or airport runways, limit road and air travel, or cause a tsunami that could damage boat harbors and other water travel infrastructure. |
| Economy | There are no recorded economic impacts due to earthquakes in Akutan. |
| Subsistence Resources | There are no recorded earthquake caused impacts on subsistence resources in Akutan. |

#### C.4.1.4.5 Probability of Future Events

Seismic activity is a frequent occurrence in Akutan. A M2.9 earthquake was detected 56 miles SE of Akutan on August 4th, 2026 at a depth of 5.6 miles (UAF Alaska Earthquake Center, 2026).

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Akutan will experience an earthquake event of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### C.4.1.4.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The characteristics and nature of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Location | The location of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Extent | The extent of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Impact | The impact of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Probability of Future Events | The probability of future earthquake events is not affected by changing climate conditions and is not expected to change on human timescales (Alaska DHS&EM 2023). |
| Population Patterns | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, population patterns in Akutan are not expected to be affected. |
| Land Use Development | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, land use development in Akutan is not expected to be affected. |
| Subsistence Resources | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, subsistence resources in Akutan are not expected to be affected. |

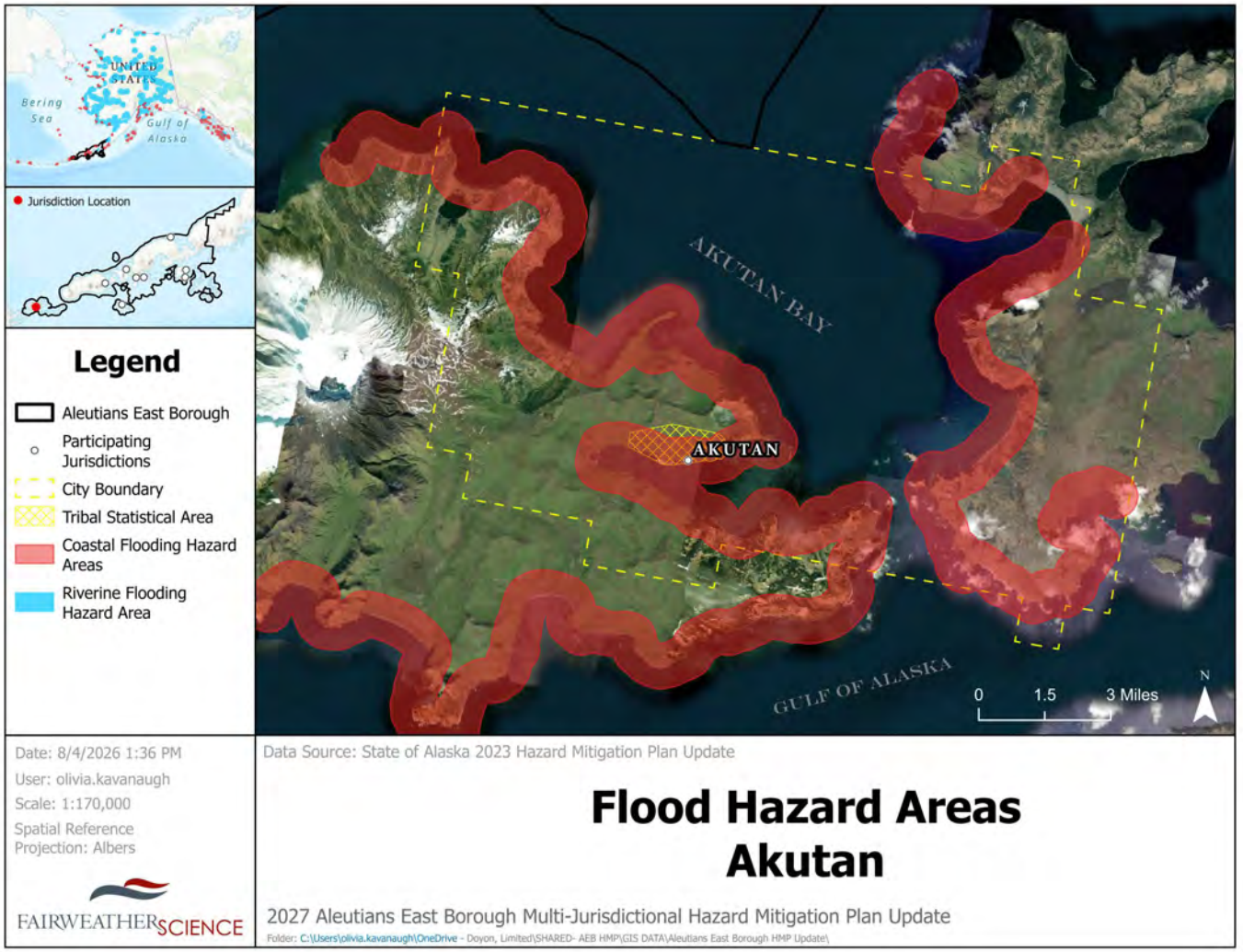
### C.4.1.5 Flood

The Native Village of Akutan Planning Team reports experiencing flood events, including storm surge and high tide (king tide) events.

#### C.4.1.5.1 Location

According to the 2023 State HMP, Akutan is within the identified Coastal Flooding Hazard Area (Figure ). The State of Alaska identifies coastal flooding hazard areas of 0.5 miles from the coastline (DHS&EM 2023).

The Native Village of Akutan Planning Team reports that high waters from high tides and storm surge impact the area by the City Dock in the wintertime.




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure C-8- Akutan Flood Hazard Areas**

#### C.4.1.5.2 History

The National Weather Service records major historical severe weather events, including flooding. Within this list for AEB communities, only one event description includes flooding for Akutan.

On January 6th, 2024 there was a high wind event with winds gusting 102 mph. The storm caused some flood damage, with a boat inundating due to the weight of the rain and snow and a breakwater being damaged (NWS, 2026).

The Native Village of Akutan Planning Team reported that storm surges have washed out the area by the City Dock in the wintertime.

#### C.4.1.5.3 Extent (Magnitude and Severity)

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest (number 63) has the lowest vulnerability.

***Of these 187 communities, Akutan received a flood threat ranking of 59 out of 63 (Denali Commission, 2019).***

While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking.

Past flood events in Akutan have resulted in several inches of inundation and has caused washouts near the City Dock.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding in Akutan is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### C.4.1.5.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | High tides combined with storms can increase coastal flooding and wave impacts in low-lying waterfront areas in Akutan. The Planning Team reports that there was some flooding in Akutan a few years ago due to the increase in precipitation, which is a global warming impact in the Arctic. |
| Infrastructure | Wave action, coastal flooding, and high tides threaten waterfront infrastructure, such as the Akutan Library and residential homes in Akutan. No other specific previous flood impacts were reported by the Planning Team. |
| People | No specific reports of personal injury or death have been reported due to flooding in Akutan. |
| Utilities | No specific reports of utility outages or failures due to flooding have been reported in Akutan. |
| Transportation | Storm surge has washed out the area by the City Dock in the winter. This is where the water comes up higher. No other specific previous flood impacts were reported by the Planning Team. |
| Economy | No specific impacts to the economy have been reported due to flooding in Akutan. |
| Subsistence Resources | No specific reports of transportation impacts due to flooding have been reported in Akutan. |

#### C.4.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Akutan will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### C.4.1.5.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in the Planning Area as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in the Planning Area is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in the Planning Area, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in the Planning Area. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021).<br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in the Planning Area, however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |
| Population Patterns | It is possible that future flood events will cause changes in population patterns in the Planning Area as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such |

| Description of Future Conditions | |
|---|---|
| | as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### C.4.1.6 Ground Failure/Landslide

#### C.4.1.6.1 Location

Akutan is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity.

Many landslide paths coincide with avalanche paths, especially at higher elevations. Unmapped areas within the Borough remain to be studied for landslide hazards and will be included in future updates of this plan as resources become available to evaluate those areas for landslide hazards.

As landslide hazard areas are not well defined in the community and detailed terrain data, such as LiDAR, were not available, ArcGIS Pro basemaps, including satellite imagery, topographic maps, and terrain data, were used to identify mountainous areas, elevation, and observable slope characteristics.

Potential landslide hazard areas were manually delineated based on these features (Figure ). Where available, photographs of the surrounding geography were also reviewed to confirm the presence of steep slopes and other terrain characteristics indicative of potential landslide hazard.

***This assessment is intended to identify potential areas of landslide hazard at a planning level. It is not a substitute for site-specific landslide hazard mapping, geotechnical investigations, or detailed evaluation of local topography, and site-specific conditions. Areas identified through this assessment should be considered preliminary and should be subject to further investigation where development or other activities may be exposed to landslide hazards.***

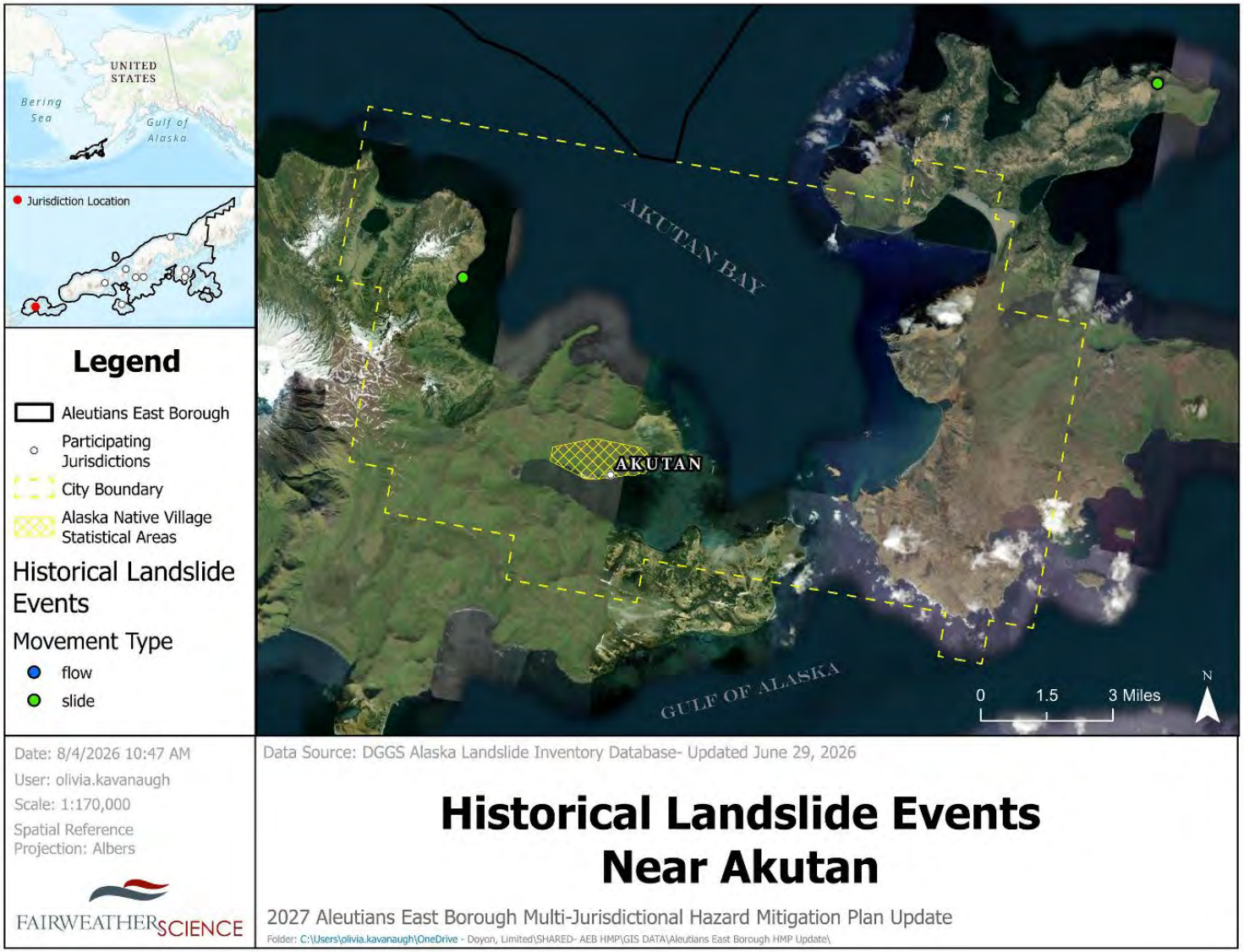



**Figure C-9- Landslide Events in Akutan**

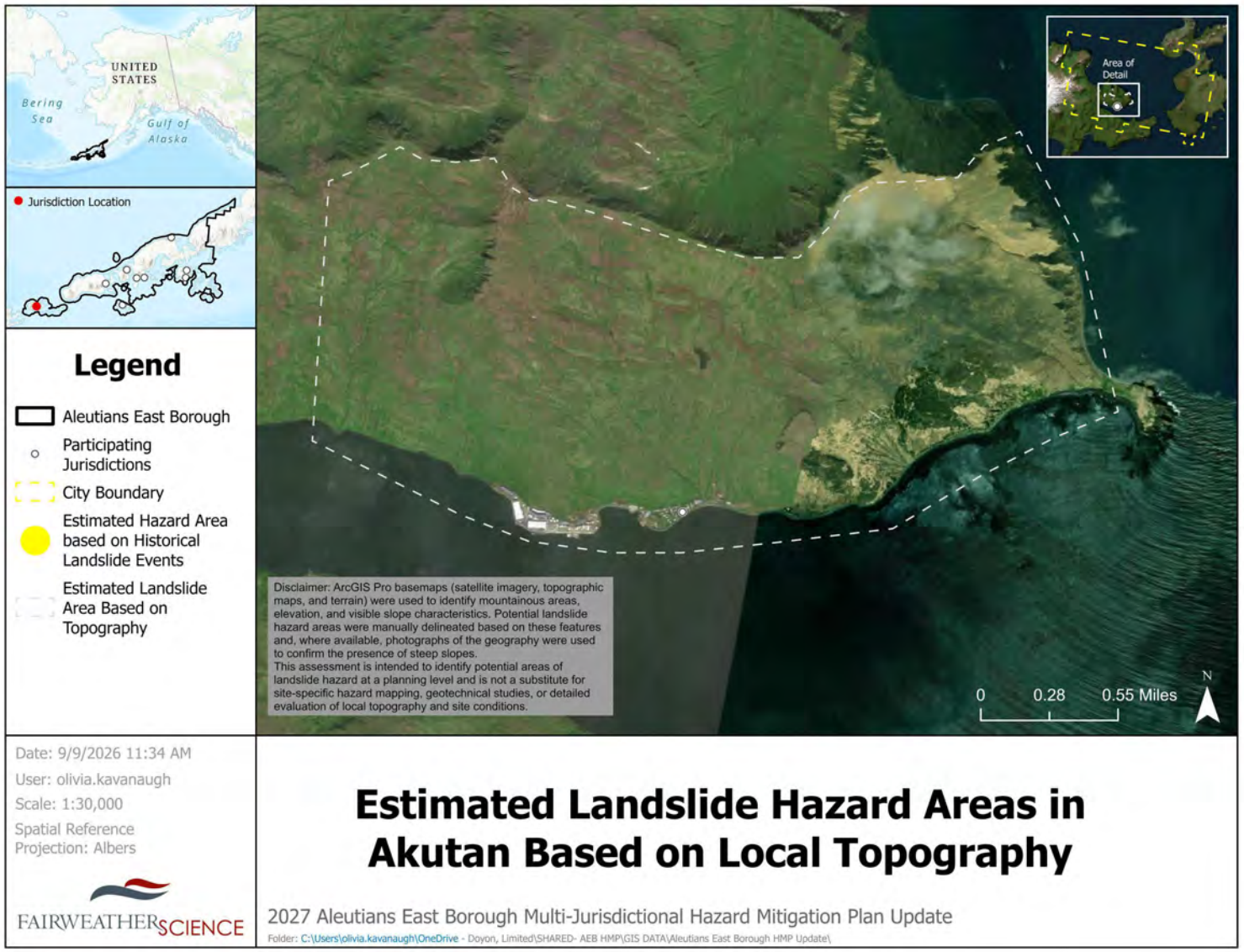



**Figure C-10- Estimated Landslide Hazard Areas in Akutan Based on Local Topography**

#### C.4.1.6.2 History

There has been one (1) recorded subaerial landslide event in Akutan. The Alaska Landslide Inventory Database does not provide any additional information other than it was classified as a landslide and not a debris flow.

The April 1st, 1946 earthquake near Unimak Island (approximately 42 m east of Akutan, 35 miles west of Cold Bay and 45 miles east of King Cove) created a tsunami wave that reached all the way to Antarctica. For years, speculation existed that the large tsunami was aided by a submarine landslide due to the disproportionate waves created by the earthquake. In 1996, the USGS GLORIA discovered numerous slope failures (historic submarine landslides) along the eastern Aleutian Shelf. An exceptionally large failure was found at the location of the now named Ugamak Slide (Fryer, Watts, Patson 2004). The Ugamak Slide consists of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

If the Ugamak Slide did indeed occur on April 1st, 1946, it is likely that much of the seismic motion, especially at longer periods, was from the slide itself. A tectonic shock, a shallow subduction earthquake, was probably the trigger but differentiating it from the rest of the motion may prove impossible. The evidence for a landslide source to the 1946 tsunami is substantial (Fryer, Watts, Patson 2004).

#### C.4.1.6.3 Extent (Magnitude and Severity)

Damage from ground failure or landslides ranges from minor with minimal repairs required to a massive economic impact with the possible destruction of critical community infrastructure and potential loss of human life.

Subaerial landslides on sloped terrain in Akutan pose a threat to critical facilities or human life. Subaerial landslides near bodies of water also pose a threat to critical facilities or human life in the Planning Area as they may trigger a tsunami or seiche.

A landslide (both submarine and subaerial) has the ability to trigger a tsunami. Due Akutan's location between the Bering Sea and the Pacific Ocean, and exposure to the open ocean, a submarine landslide-induced tsunami affecting the Planning Area in the future is a possibility. In the past, a submarine landslide created secondary hazards (tsunamis), that have impacted Akutan.

Based on the Alaska Landslide Inventory Database, it can be estimated that the historical landslides recorded in Akutan range in width of less than 100 feet to over 500 feet.

The largest discovered underwater landslide deposit in the Aleutians East Borough is the Ugamak Submarine Slide. The Ugamak Submarine Slide consisted of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

Based on the extent of past landslide events and the criteria identified in Table 5 in the Base Plan, the extent of landslide events in Akutan is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### C.4.1.6.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | One recorded landslide has impacted Akutan; however, the landslide did not occur near the population center of Akutan and it did not affect any critical facilities.<br>Future landslides could damage steep hillsides, making them more prone to land destabilization, avalanches, and further landslides. |
| Infrastructure | There have not been any recorded impact on infrastructure in Akutan.<br>Landslides can move structures off their foundation, damage walls and roofs, and cover or damage roadways and airport runways. |
| People | There have been no recorded injuries or fatalities due to landslides in Akutan. Landslides can injure or kill people due to debris and soil flowing or burying people. |

| Description of Impacts | |
|---|---|
| Utilities | There have been no recorded landslide impacts to utilities in Akutan. Landslides could damage sewer, water, and utility lines. |
| Transportation | There have been no recorded landslide impacts on transportation systems in Akutan. Road and air travel could be halted or delayed due to landslides damaging or covering the infrastructure. A submarine landslide could create a tsunami or seiche that damages boat harbors or other marine infrastructure, limiting water travel. |
| Economy | There have been no recorded economic impacts due to landslides in Akutan. |
| Subsistence Resources | There have been no recorded landslide impacts to subsistence resources in Akutan. |

#### C.4.1.6.5 Probability of Future Events

Historically, the largest and most destructive landslides have been associated with more than 1.5 inches of rain in a 24-hour period. Precipitation records indicate that precipitation intensities of 2.0 inches in 24 hours can be expected at return periods of 5-10 years. Therefore, the conditions necessary for production of large landslides continue to prevail today even though major, destructive landslides do not occur frequently. Although the probability for ground failure is location-specific, the probability is likely, and increasing, due to future climate events (DHS&EM 2023).

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Akutan will experience a landslide event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### C.4.1.6.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of landslides in the future. |
| Location | It is possible that future climate conditions will influence the location of future landslides in Akutan. Landslide probability is location specific, and numerous variables must be considered. It is common for debris flows to recur in the same channel or to shift slightly. Other types of landslides may reoccur in the same place or the area directly adjacent to a previous landslide. Akutan is located in a highly seismic area, which can trigger landslides at any time, and create areas prone to landslides that did not used to be.<br>Ground failures related to more frequent severe weather events, an increase in atmospheric rivers, and potential droughts are expected to appear in locations that were previously frozen and are now thawing. This includes areas that are immediately adjacent to recently thawed ground and where overlying vegetation has been removed. However, landslides also occur in areas with no prior known instabilities due to changing conditions such as increased rainfall, strong earthquake shaking, and human activities (DHS&EM 2023). |
| Extent (Magnitude and Severity) | It is likely that future climate conditions will influence the magnitude of future landslides in Akutan. Landslides are expected to increase in magnitude with increased areas of effect as severe weather events increase in frequency (IPCC 2019).<br>Future climate conditions are expected to increase landslide frequency of all intensities, and as people develop across the landscape, including into hazardous areas, there will likely be an increase in more significant outcomes in the future (DHS&EM 2023). |

| Description of Future Conditions | |
|---|---|
| Impact | It is likely that future climate conditions will influence the impact of future landslides in Akutan. Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from an increase in atmospheric rivers, severe weather events, and glacial decline (IPCC 2019), which could increase future ground failure events and resultant impacts. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of future landslides in Akutan. Although the probability of ground failure is location-specific, it is likely, and increasing, due to a changing climate. Severe weather events such as precipitation and wind are a direct result of atmospheric warming. Atmospheric rivers are becoming increasingly common and increase the intensity and duration of precipitation events at regional and local scales. Landslide events are directly related to high intensity precipitation events, and those are likely to become more common over greater geographic regions of Alaska (DHS&EM 2023). |
| Population Patterns | It is possible future climate conditions will influence population patterns in Akutan. The Planning Area is experiencing a slight increase in population as an overall trend. Since 2020, the population has remained stable from 1,589 to 1,591 residents (US Census 2026). This may eventually mean more of the resident population living in landslide hazard areas, however an increased growing season due to future climate conditions could lengthen the tourist season. An increase in tourists throughout the year could possibly increase the number of people that are at risk of landslide hazards at any given moment. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Akutan. Limiting development and relocating existing development outside of landslide hazard areas would change the development in these areas. A landslide warning system could require infrastructure development, and more development outside of the landslide zones could increase land use to accommodate displaced residents. It is also possible that land developed in the future, or that has already been developed, may eventually become prone to landslide hazards. |
| Subsistence Resources | It is possible that future climate conditions will result in landslides impacting subsistence resources. Landslides could wipe out land access to certain parts of coastline, berry gathering locations, or trails leading to hunting or fishing grounds. |

### C.4.1.7 Invasive Species

#### C.4.1.7.1 Location

The entire natural area surrounding Akutan is vulnerable to the spread of invasive species, particularly terrestrial invasive plants and invasive rats. Akutan's location adjacent to a busy coastal port is the primary human-caused pathway in the spread of invasive species in the region.

In Akutan, several species of invasive terrestrial plants and animals have been documented, including:

- Big Chickweed
- Common Chickweed
- Spreading Bluegrass Or Kentucky Bluegrass
- Creeping Buttercup
- Tall Buttercup
- Italian Ryegrass
- Thymeleaf Speedwell
- Norway rat

Figure C-11 depicts the locations of documented invasive terrestrial plant species in Akutan, as reported by community members in the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database.

Note that the "downtown" area may have more documented invasive species sightings than other areas of the community due to its higher population density and greater likelihood of observation and reporting. Therefore, the number of reported sightings may not necessarily reflect the actual distribution or abundance of invasive species across the community.

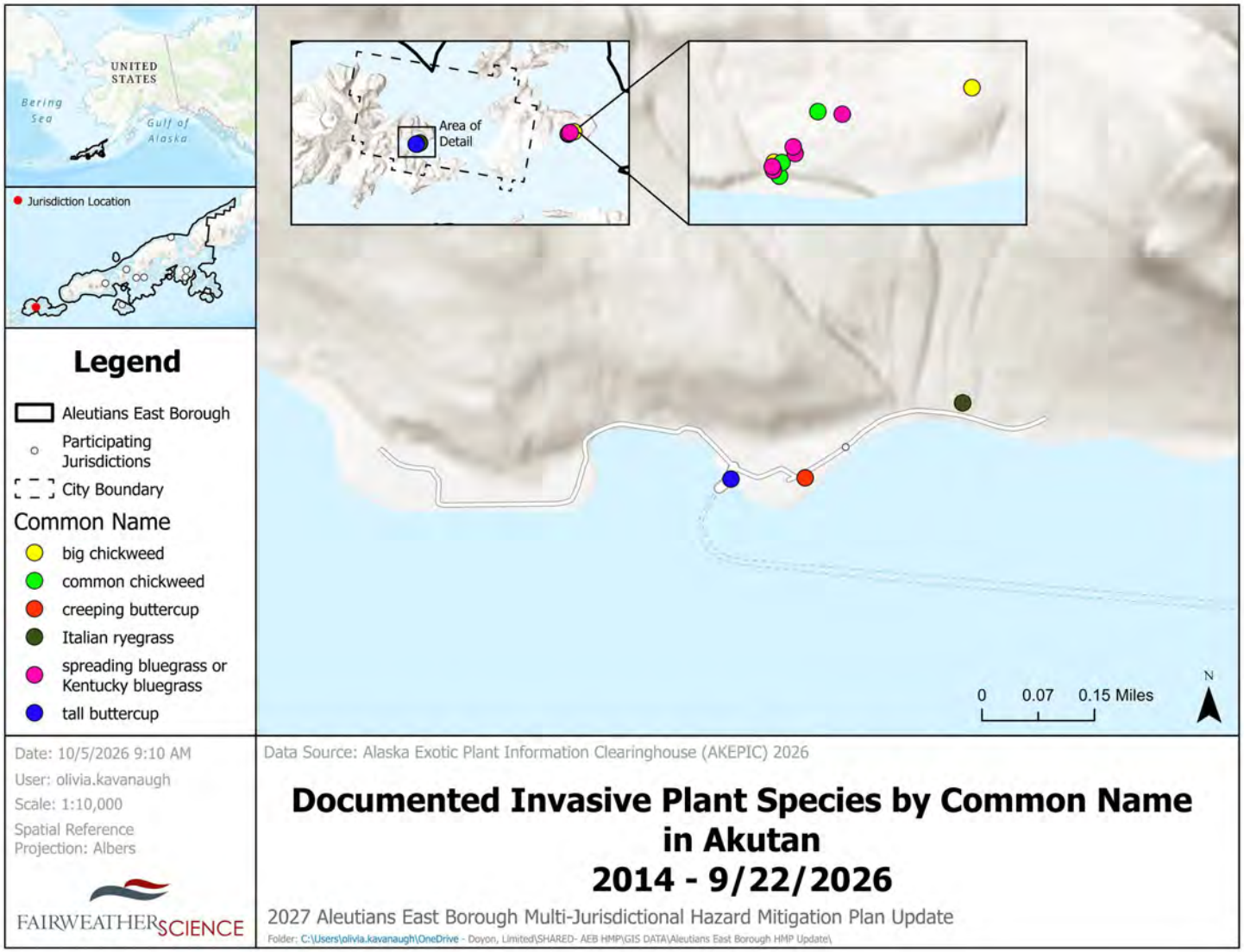



**Figure C-11- Documented Invasive Plant Species by Common Name in Akutan**

#### C.4.1.7.2 History

Akutan has had historical vessel traffic related to the fishing and shipping industry, which has contributed to the spread of invasive species in the region.

Due to the remote nature of Akutan, invasive plant establishment has historically been limited compared to more developed areas of Alaska. The development of military infrastructure during World War II, followed by continued growth in commercial fishing, transportation, and community infrastructure, likely contributed to the introduction and spread of invasive terrestrial plants throughout the region. While surveys and reporting efforts have increased in recent decades, the full distribution and history of invasive plants within the community remain uncertain due to the remoteness of communities and limited monitoring coverage.

Invasive rats first arrived in the Aleutian Islands in the 1780s, where they escaped a Japanese shipwreck and were introduced on Rat Island (WS 2021). Since then, the species multiplied rapidly and eventually resulted in a population on almost every major island on the Aleutian Chain, including Akutan. While several islands successfully eradicated these rats, Akutan is still considered to have an established population of invasive Norway rats.

#### C.4.1.7.3 Extent (Magnitude and Severity)

Although damages to the lands surrounding Akutan from invasive species has been limited, there are several non-native plants with a high invasiveness that have occurred near the community.

Table C-1 displays the non-native plant occurrences that have occurred within Akutan. A total of 8.7 acres in Akutan have been infested by invasive plants.

**Table C-1- Non-Native Plant Occurrences in Akutan**

| Invasive Plant Species | Total Infested Area (acres) | Invasiveness Ranking (0-100) |
|---|---|---|
| **Big Chickweed** | 3 | 36 |
| **Common Chickweed** | 3 | 42 |
| **Spreading Bluegrass Or Kentucky Bluegrass** | 2.3 | 52 |
| **Creeping Buttercup** | 0.2 | 72 |
| **Tall Buttercup** | 0.2 | 60 |
| **Italian Ryegrass** | 0.001 | 41 |
| **Thymeleaf Speedwell** | 0.001 | 36 |
| **Total** | **8.702 acres** | **Maximum Ranking: 72** |

Source: AKEPIC 2026

While there is limited data on the extent of invasive rats in Akutan, a member of the Native Village of Akutan Planning Team stated that the rat population gets into food and contaminates everything that they infiltrate.

**While invasive species are a concern for many communities, at this time, the presence of these species is not impacting critical facilities.**

Based on previous occurrences and the criteria identified in Table 5 of the Base Plan, the magnitude and severity to Akutan from invasive species are considered **Limited**.

#### C.4.1.7.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The primary impact of invasive species on the land surrounding Akutan has been localized non-native plant and rat infestations, which can outcompete native plants and wildlife. |
| Infrastructure | There is limited evidence that invasive species have directly impacted infrastructure in Akutan. |
| People | Invasive rats impact the people in Akutan by getting into food and contaminating everything that they infiltrate While invasive plants can affect resources that people depend on, Akutan has no history of invasive plants directly affecting the residents of the community. |
| Utilities | There have been no documented cases of invasive species causing utility disruptions in Akutan. |
| Transportation | Transportation is identified as a major pathway for invasive species to spread throughout Akutan, particularly invasive rats and terrestrial plants. Due to the nature of invasive species in the community, there is little evidence to show that these species cause direct damage to transportation infrastructure in Akutan. |
| Economy | There have been no reports of an invasive species infestation resulting in significant economic impacts in Akutan. |
| Subsistence Resources | Invasive species pose a potential threat to subsistence resources in Akutan. Plant species like the Creeping Buttercup are known to outcompete native plants and berries, which are a key aspect to subsistence culture for the community. Invasive rats can eat various bird eggs and live birds, which can impact the broader food web and possibly affect subsistence patterns. |

#### C.4.1.7.5 Probability of Future Events

Based on previous occurrences, and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Akutan will experience an invasive species event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### C.4.1.7.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | It is possible future climate conditions will influence the nature of invasive species in Akutan. Warmer temperatures and longer growing seasons may allow some invasive species to become established in areas where they don't historically occur. |
| Location | It is likely future climate conditions will influence the location of invasive species in Akutan. Changes in temperature and precipitation patterns may allow invasive species to expand into new terrestrial and marine areas of Akutan. |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of invasive species in Akutan. Future changes may create favorable conditions for certain invasive species, allowing populations to spread at a rapid rate. |
| Impact | It is likely future climate conditions will influence the impacts of invasive species in Akutan. |

| Description of Future Conditions | |
|---|---|
| Probability of Future Events | It is likely future climate conditions will influence the probability of invasive species in Akutan. As environmental conditions change, areas that were previously unsuitable for certain invasive species may become more favorable for establishment and spread, which increases the probability of future events in Akutan. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Akutan. Changes in the distribution and abundance of invasive species may alter the availability of food and habitat relied upon by wildlife and residents of Akutan. |
| Land Use Development | It is unlikely future climate conditions will influence future land use development in Akutan. |
| Subsistence Resources | It is likely future climate conditions will influence subsistence resources in Akutan. Changes in ocean conditions, weather patterns, and species distribution may affect the availability and accessibility of important subsistence resources. The introduction or expansion of invasive species could further impact native species that support subsistence activities in Akutan. |

### C.4.1.8 Sediment Deterioration and Land Destabilization

#### C.4.1.8.1 Location

Sediment deterioration and land destabilization can occur throughout Akutan, with coastal land destabilization being the biggest concern for the community. Since Akutan is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.

Riverine sediment deterioration and land destabilization is not identified as a concern for the community.

At the beginning of 2026, PND Engineers began the "Akutan Beach Erosion Mitigation Project" in the community. This Project consists of collection and analysis of existing data, a site visit, community meeting, shoreline mitigation measures assessment, and hydrodynamic modelling (PND Engineers 2026).

The site visit and fieldwork began in May 2026 and the following was completed: hydrographic surveying, topographic surveying, installation of four water level loggers at the east end of the Village Dock (with local training on how to retrieve loggers and send the data to PND), and sediment sample collection. PND also provided the City of Akutan with a drone for future shoreline change monitoring (PND 2026).

While the extent of sediment deterioration and land destabilization in Akutan varies by location, many facilities along the waterfront may be increasingly vulnerable to future destabilization. Currently, the area in front of the library and along the shoreline area extending to the incinerator are experiencing the most significant shoreline loss (PND Engineers 2026).




Source: PND Engineers, City of Akutan

*Figure C-12- Areas of Concern for Shoreline Loss in Akutan, 2026*

The Planning Team states that, Akun Island, which support's the community's airport is of interest for future land restoration and vegetation projects. The area presents challenges due to coastal sediment deterioration and land destabilization.

#### C.4.1.8.2 History

The history of coastal sediment deterioration and land destabilization in Akutan varies by location due to the localized nature of storms in the community. According to a Planning Team member, sediment deterioration and land destabilization below the community boardwalk is a major concern for Akutan,

especially due to the potential of the surrounding roadways being impacted. Additionally, the area near the city dock experiences sediment deterioration and land destabilization, especially during large winter storms.

The Native Village of Akutan also reported community concern that the south side of Akutan Island may be sinking or that surrounding water levels may be rising. The cause of the observed condition has not been determined, and the two possible interpretations provided by the Tribe are retained without assigning a specific mechanism.

Additionally, a 2026 land destabilization mitigation project documented active destabilization areas along Akutan's shoreline and identified drainage and wave-induced mechanisms for the destabilization.

#### C.4.1.8.3 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of sediment deterioration and land destabilization varies throughout select communities.

In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk. Akutan was categorized in Group 3, which places it at a lower risk of sediment deterioration and land destabilization according to the study.

**PND Engineers has determined that the main drivers of sediment deterioration and land destabilization in Akutan are:**

- **Poor drainage management**
- **Runoff infiltrates into the bluffs**
- **Seepage raises the pore-water pressure which reduces shear strength of the soil**
- **Groundwater emerges along the bluff face**
- **Wave attack exacerbate deterioration by removing material from the toe of the bluffs**

Photos from the PND August 2026 presentation show coastal erosion ranging from several to tens of feet (see figure below).

The simulated wave climate of the hydrodynamic modelling will be used to determine the required sizing of the proposed shoreline protection measures, giving the City with a strategic plan of mitigation further shoreline loss in the community (PND Engineers 2026).



Source: PND Engineers, City of Akutan

**Figure C-13- Gabion Baskets and Land Destabilization in Akutan, May 2026**




Source: PND Engineers, City of Akutan

**Figure C-14- Current Land Destabilization in Akutan, 5/19/26**

The following photograph was taken in front of the Bayview Hotel on February 21st, 2025. It was submitted by a community member and depicts erosion starting from the Old Library building (the yellow building in the left of the picture).



Source: Vera Pelkey

**Figure C-15- Shoreline Loss in Front of the Old Library, 2/21/2025**

The following photograph was taken in front of the Duplex/Daycare/Teachers Apartment in Akutan. It was submitted by a community member and depicts shoreline loss starting from the Old Library.



Source: Vera Pelkey

**Figure C-16- Shoreline Loss in Front of the Duplex Daycare/Teachers Apartment, 2/21/2025**

The following photograph was taken in front of the Duplex looking east in Akutan. It was submitted by a community member and depicts shoreline loss starting from the Old Library.



Source: Vera Pelkey

**Figure C-17- Shoreline Loss in Front of the Duplex and Looking East**

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 in the Base Plan, the extent of sediment deterioration and land destabilization in Akutan is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### C.4.1.8.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding Akutan has been damages to shoreline and beaches, particularly along areas exposed to waves and storms.<br>In the community, impacts from destabilization has been documented near critical facilities such as the library, the city dock, and the police and fire department. |
| Infrastructure | Sediment deterioration and land destabilization impacts in Akutan have been documented near the library, the police and fire department, and residential homes near the waterfront. Continued sediment deterioration and land destabilization could threaten additional community infrastructure and increase mitigation costs. |

| Description of Previous Impacts | |
|---|---|
| People | While sediment deterioration and land destabilization can affect residents of Akutan by threatening homes and access to subsistence areas, direct impacts to people in Akutan resulting from sediment deterioration and land destabilization have been limited. Land deterioration directly impacts people's ability to build. Akutan has a small area and the lands that are not built on are few and far between. |
| Utilities | There have been no documented impacts to the utilities in Akutan from sediment deterioration and land destabilization events. |
| Transportation | The primary transportation related impacts from a sediment deterioration and land destabilization event in Akutan are damage to roads, boardwalks, and other transportation infrastructure. There have been no reports of sediment deterioration and land destabilization resulting in substantial disruptions to transportation in Akutan. |
| Economy | There are a substantial number of roads in Akutan that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities. |
| Subsistence Resources | A primary concern related to subsistence resources in Akutan is the loss of subsistence fish camps and fish cleaning sites that have been used for generations, which have the potential to be washed-out or the access restricted during a storm.<br>On Akun Island, future land restoration and vegetation projects are currently at risk due to the impacts of coastal erosion. |

#### C.4.1.8.5 Probability of Future Events

The low-lying geography influences the likelihood of continued sediment deterioration and land destabilization in Akutan.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Akutan will experience a sediment deterioration and land destabilization event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### C.4.1.8.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in Akutan. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in Akutan. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal land destabilization in Akutan (AK DGGS 2026). |
| Extent (Magnitude/Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in Akutan. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in Akutan. Projected increases in |

| Description of Future Conditions | |
|---|---|
| | precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in Akutan. Although the probability for land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Akutan. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of Akutan entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Akutan. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in Akutan. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

### C.4.1.9 Severe Weather

The Native Village of Akutan Planning Team reports experiencing high winds and heavy/drifting snow.

#### C.4.1.9.1 Location

The entire geography of Akutan is susceptible to severe weather events and impacts.

In the wintertime, storm surge impacts low-lying areas and the area near the City Dock.

#### C.4.1.9.2 History

Table  lists severe weather events that have occurred in Akutan between 1996 and March 2026. High wind events are the most frequent severe weather event impacting Akutan.

**Table C-2- Historical Severe Weather Events in Akutan (1996 - March 2026)**

| Date | Event Type | Event Description |
|---|---|---|
| 1996-05-24 | High Wind | Wind gusts reached at least 45 mph at Akutan. |
| 1996-10-28 | High Wind | Akutan reported gusts in excess of 65 mph and 53 mph at Cold Bay. |
| 1996-10-31 | High Wind | Wind gusts reached 54 mph at Cold Bay and close to 85 mph at Akutan. |
| 1996-09-25 | High Wind | Wind gusts reached 60 mph in Akutan. |
| 1996-09-11 | High Wind | Wind gusts of 43 mph from the north were recorded at the Akutan school. |
| 1996-09-12 | High Wind | Strong wind gusts of 70 mph were reported at the Akutan school. |
| 1997-11-04 | High Wind | Wind gusts of 70 to 90 mph were reported at the Akutan school. |
| 2006-02-13 | High Wind | Reports received from the vessel Stimson in Akutan were of wind peaking at 123 KTS that resulted in the vessel "tipping over" in the harbor. |
| 2015-11-11 | High Wind | Damage at Akutan reported by local emergency manager: Construction materials at a new fourplex blown away. Very strong winds still occurring. |
| 2017-11-23 | High Wind | Akutan AWOS measured 76 knot winds at 2:35 a.m. |
| 2020-02-08 | High Wind | Akutan Airport had a peak gust to 84 mph during this time. |
| 2024-01-06 | High Wind | Akutan measured a gust of 89 knots (102 mph). Winds then decreased through the evening hours. Additionally, the storm caused some damage, with a boat flooding due to the weight of the rain and snow and a breakwater which had been damaged previously receiving additional damage. |
| 2024-09-17 | High Wind | A marine exchange observation (site AKXA2 in Akutan) reported a gust to 82 mph at about 2 PM AKST, then later reported a gust to 93 mph about an hour later shortly before 3 pm AKST. The legitimacy of the higher end gust, however, was not able to be verified by any other sources nearby. |
| 2024-10-04 | High Wind | Wind gusts of 65 knots (75 mph) or greater were observed in Akutan and at other stations around Unalaska. |
| 2024-10-10 | High Wind | Numerous other mesonet sites recorded gusts between 75 and 95 mph across the eastern Aleutians, including in Nikolski and Akutan at varying times between approximately 9 AM AKST 10/11 to 5 AM AKST 10/12. |
| 2025-01-22 | High Wind | A C-MAN Station in Akutan reported a wind gust of 82 mph at 4:42 PM AKST on January 22nd. Winds were gusting to over 70 mph for two hours |

| Date | Event Type | Event Description |
|---|---|---|
| | | before this peak wind gust was reported and continued to gust to over 70 mph until 6:00 PM AKST the same day. |
| 2025-04-03 | Winter Storm | In Akutan, visibility below half a mile was shown by a webcam in the evening hours of April 3rd. A TV meteorologist from KTUU relayed that a source in Akutan reported 8 to 10 inches of snow accumulation in the town with 2 to 4 ft snow berms on April 4th. Winds gusted to 60 mph. |
| 2025-04-15 | Winter Storm | In Akutan, a news reporter relayed that 10 to 15 inches of snow fell in the settlement with winds gusting to 60 to 80 mph. Snow berms/drifts were built up to 4 feet. |
| 2026-01-04 | High Wind | The Eastern Aleutians including Unalaska and Akutan saw winds gusting over 80 mph from January 4 to January 5. A marine observation site in Akutan (NDBCAKXA2) had a peak wind gust of 107 mph at 2:12 PM AKST January 5. The site also reported more gusts over 100 mph around the same time. |

Source: NOAA NCEI 2026- Storm Events Database

#### C.4.1.9.3 Extent (Magnitude and Severity)

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather in Akutan is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### C.4.1.9.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | Winter storms cause coastal erosion and land destabilization, especially in low-lying coastal areas in Akutan. No other specific previous impacts were reported by the Native Village of Akutan Planning Team. |
| Infrastructure | Winter storms cause coastal erosion and land destabilization, especially in low-lying coastal areas, threatening infrastructure such as the police department, fire department, City Dock, and other buildings. No other specific previous impacts were reported by the Native Village of Akutan Planning Team. |
| People | No specific reports of personal injury or death due to severe weather have been reported in Akutan. |
| Utilities | Power outages due to high wind events have been reported in Akutan. |
| Transportation | The Native Village of Akutan Planning Team reported frequent fog disruptions to aviation in Akutan – especially flight cancellations – as well as marine transportation and emergency access. |
| Economy | While the local economy in Akutan has not been significantly impacted by severe weather events, the primary economic driver in the community is fishing. If fishing vessels or the processing plant were to be damaged in a storm, the economy of Akutan would be significantly impacted. |
| Subsistence Resources | The Native Village of Akutan Planning Team reported that winter storms are causing land destabilization in an area on the front beach where the community cleans and processes fish in Akutan. |

#### C.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Akutan will experience a severe weather event (dense fog, extreme cold, heavy rain, heavy snow, or high winds), within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

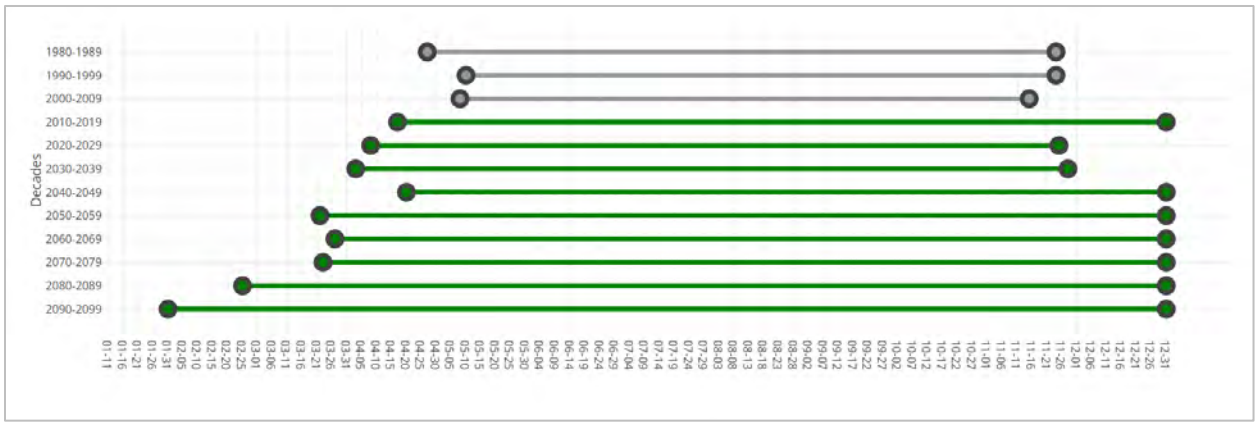
### C.4.1.9.6 Future Climate Conditions

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in Akutan. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in Akutan. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in Akutan. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in Akutan. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in Akutan. | It is unlikely that future climate conditions will influence the nature of future high wind events in Akutan. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in Akutan. | It is possible that future climate conditions will influence the location of future drought/water supply events in Akutan. | It is unlikely that future climate conditions will influence the location of future extreme cold events in Akutan. | It is possible that future climate conditions will influence the location of future heavy rain events in Akutan. | It is unlikely that future climate conditions will influence the location of future heavy snow events in Akutan. | It is unlikely that future climate conditions will influence the location of future high wind events in Akutan. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in Akutan could increase (UAF/SNAP 2025). | In Akutan, average annual temperatures may increase by about 7°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+7°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026).<br>Climate changes within Alaska is likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In Akutan, average annual temperatures may increase by about 7°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+7°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in Akutan. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP).<br>Extreme precipitation events have occurred throughout Alaska with increasing frequency.<br>In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>Akutan experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months. Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). |
| Impact | Projected increases in precipitation and associated moisture availability in Akutan could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026).<br>Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in Akutan are projected to increase; with estimated winter temperature increases of approximately +7°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities in the Aleutians East Borough (Alaska DHS&EM 2023). | While overall temperature trends in Akutan are projected to increase, with estimated winter temperature increases of approximately +7°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In Akutan, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+25%) (UAF/SNAP 2026).<br>As precipitation increases, impacts associated with heavy rainfall (localized flooding, landslide potential, roadway washouts, etc.) will increase. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | levels.<br>The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in Akutan by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in Akutan are projected to increase; with estimated winter temperature increases of approximately +7°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In Akutan, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+25%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in Akutan are projected to increase, with estimated winter temperature increases of approximately +7°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In Akutan, winter is likely to have more precipitation (UAF/SNAP 2026).<br>Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in Akutan may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in Akutan have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in Akutan. | Future conditions of drought are not anticipated to significantly affect population patterns in Akutan. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in Akutan. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | It is not likely that future conditions influencing heavy rain will impact changes in Akutan population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in Akutan population patterns. | It is not likely that future conditions influencing high winds will impact changes in Akutan population patterns. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in Akutan. | Future conditions of drought are not anticipated to substantially affect future land use development in Akutan. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in Akutan, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in Akutan population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in Akutan land use development. | It is not likely that future conditions of high winds will impact changes in Akutan population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in Akutan. | Future conditions of drought may affect subsistence resources in Akutan, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | Future conditions of extreme cold may affect subsistence resources in Akutan, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | It is possible that future conditions of heavy rain will impact changes in Akutan land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above Akutan, leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to development of landslide | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, | It is not likely that future conditions of high winds will impact changes in Akutan land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | monitoring equipment and/or landslide barriers/diversion structures. | thermal stress, and nutrient availability for subsistence species. | |

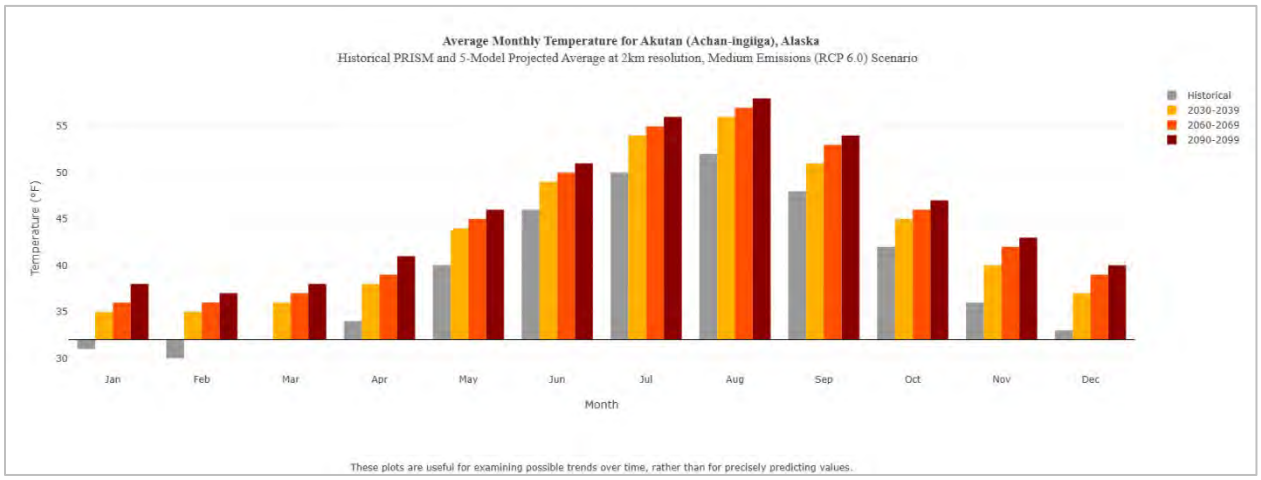
Figure  models historical and future duration of the growing season in Akutan from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure C-18- Historical and Future Projected Changes in Growing Season in Akutan (1980-2099)**

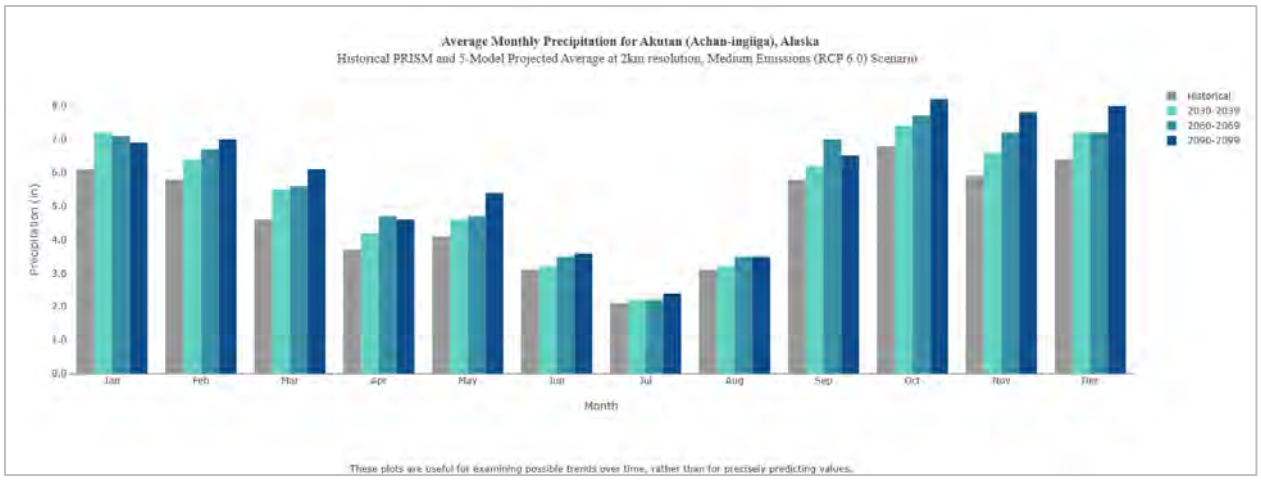
Figure  models historical and future average monthly temperatures in Akutan from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure C-19- Historical and Future Projected Average Monthly Temperature in Akutan (1980-2099)**

Figure  models historical and future average monthly precipitation in Akutan from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure C-20- Historical and Future Projected Average Monthly Precipitation in Akutan (1980-2099)**

**Projected Conditions for Akutan (Achan-ingiiga)**

In Akutan (Achan-ingiiga),
average annual temperatures
may increase by about 7°F by the end of the century.

Winter temperatures are projected to increase the most (+7°F).

Winter may transition from below freezing
to above freezing in the future.

Models have higher uncertainty with regard to precipitation,
but winter is likely to have more precipitation (+25%).

*Source: UAF/SNAP- Northern Climate Reports*

### C.4.1.10 Tsunami

#### C.4.1.10.1 Location

Akutan is located on Fox Island. Most infrastructure is at an elevation of approximately 98 feet above sea level. According to FEMA's National Risk Index, the tsunami risk for the entire AEB Planning Area is Relatively Moderate. According to the State of Alaska DHS&EM, Akutan has local tsunami potential and a medium risk of distant tsunami potential.

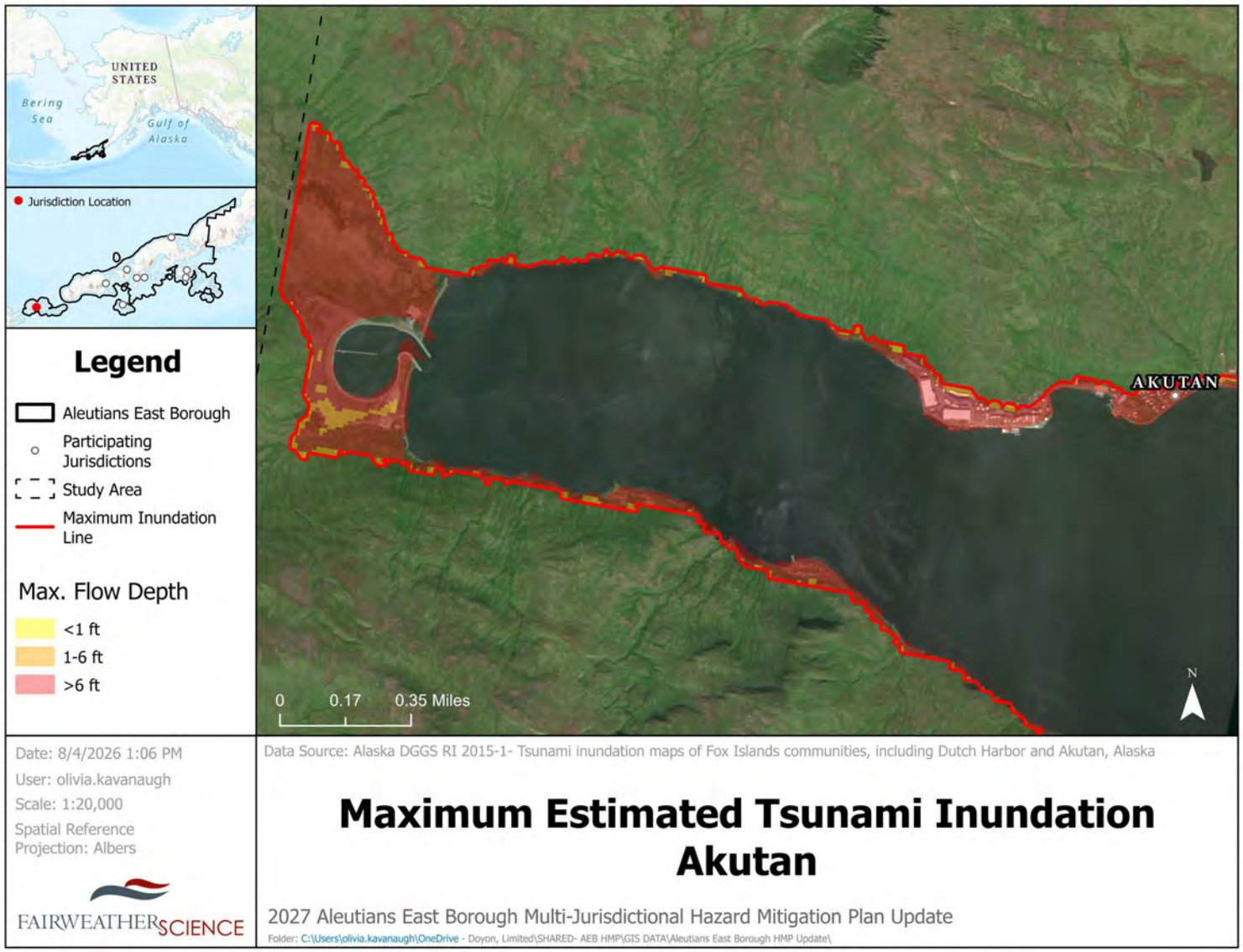



**Figure C-21- Potential Tsunami Inundation, Akutan**

### C.4.1.10.2 History

Akutan is in a tsunami-prone region due to the nearby subduction zone and frequent earthquakes. Historical tsunami warnings and evacuations have occurred.

Akutan has a tsunami evacuation plan and a tsunami siren, but Akutan is not currently a Tsunami Ready Community (AK DHS&EM 2026).

Since 1788, there have been 4 documented tsunami runup events in Akutan, which all have been under 1 foot of water depth (Table ). The most recent runup event in Akutan was recorded in 2015.

**Table C-3- Tsunami Runup Events in Akutan (1788 - August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 66 | 2010-02-27 | AKUTAN, AK | E | 8.8 | 0.72 |
| 70 | 2011-06-24 | AKUTAN, AK | E | 7.3 | 0.13 |
| 73 | 2014-04-01 | AKUTAN, AK | E | 8.2 | 0.16 |
| 78 | 2015-09-16 | AKUTAN, AK | E | 8.3 | 0.23 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

**April 1946 Aleutian Islands Earthquake and Tsunami**

The 1946 Aleutian Islands earthquake and tsunami struck on April 1, 1946, triggered by a powerful magnitude 8.6 undersea earthquake in the Aleutian Trench off Unimak Island, Alaska, which sent devastating Pacific-wide waves that resulted in a handful of deaths in Alaska and 159 deaths in Hilo, Hawaii.

The tsunami completely obliterated the steel-reinforced concrete Scotch Cap Lighthouse on Unimak Island (in the Aleutians East Borough, approximately 60 miles east of Akutan) and killed all five Coast Guard keepers (National Coast Guard Museum 2024).

Tsunami run-up was not recorded in Akutan due to this event.



Source: National Coast Guard Museum 2024

**Figure C-22- Scotch Cap Lighthouse: Before and After the 1946 Tsunami**

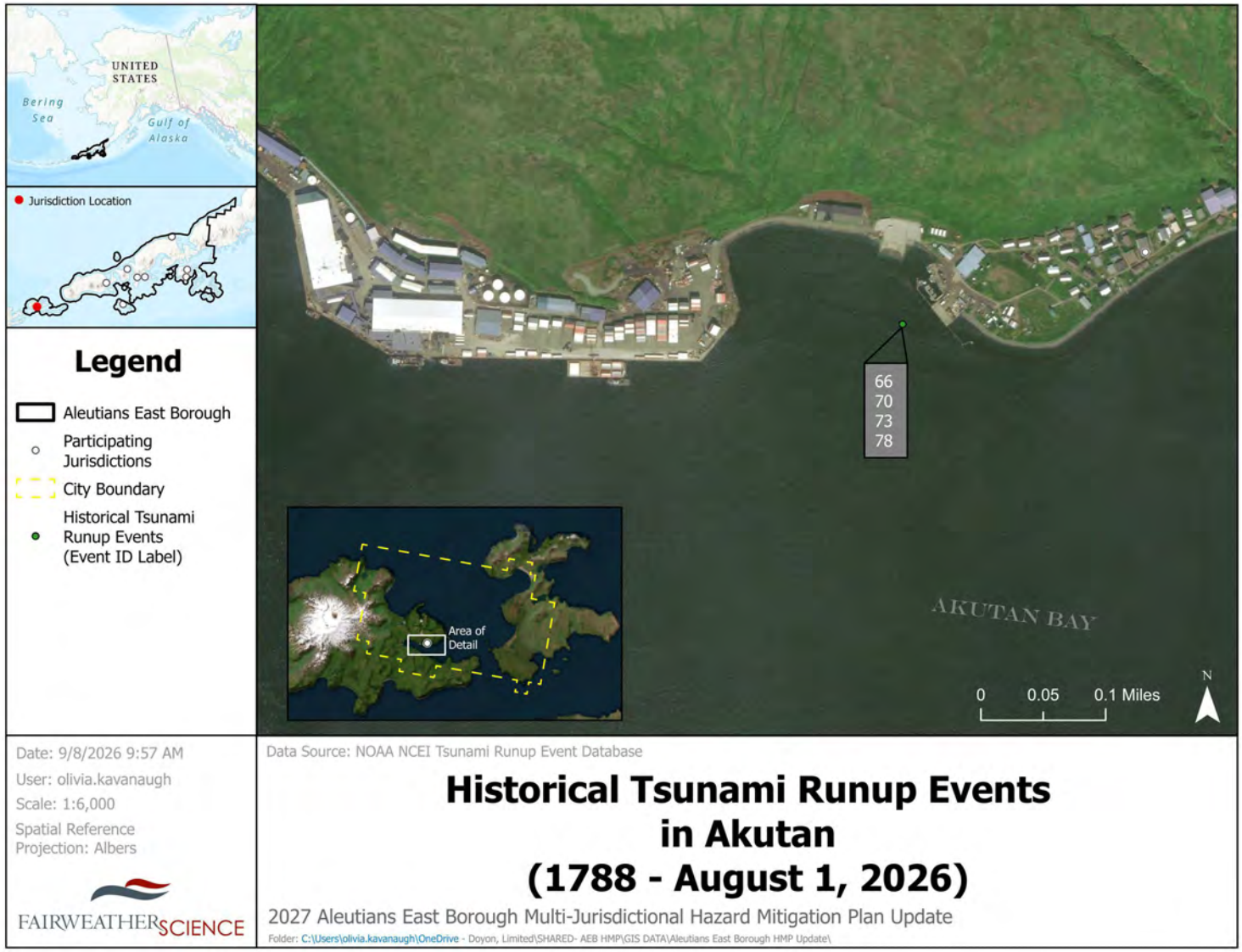



**Figure C-23- Historical Tsunami Runup Events in Akutan (1788 – August 1, 2026)**

### C.4.1.10.3 Extent (Magnitude and Severity)

Akutan has experienced tsunami runups ranging in size from less than one foot in depth to over 23 feet in depth.

Based on the inundation mapping, most areas of Akutan, including the population center and majority of critical facilities, have the potential of inundation of greater than 6 feet of water.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in Akutan is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

### C.4.1.10.4 Impact

Tsunami warnings and evacuations have occurred in Akutan.

| Description of Impacts | |
|---|---|
| Geography/Land | Previous impacts from tsunamis on the land or geography includes inundation of less than 1 foot in Akutan. Inundation of coastal areas is possible in the future, which could change shorelines. |
| Infrastructure | There are no previous impacts that have impacted infrastructure in Akutan. A tsunami could cause flood damage to coastal structures, and the force of the wave could damage walls, boat harbors, and other coastal infrastructure.<br><br>Critical infrastructure at risk includes the Tribal Office, Salmonberry Inn, Akutan Tsunami Shelter, Museum/Library building, Day Care Facility, Recreation Center, Cemetery, Akutan Church Cemetery, VPSO housing and jail, Akutan Roadhouse, McGlashan Store, St. Alexander Nevsky Church, school, City Hall, Public Safety Office, Equipment Warehouse, Clinic, Akutan Helicopter Hanger, Public Dock Facility, New Boat Harbor House, Airport Shed, GCI, ATT, ACS Communication Tower, GCI Communication Tower, ATT Communication Tower, Wind Farm, Warehouse, Bulk Fuel Storage, Harbor Power House, Hydro Generator, Generator Building, Water Treatment Plant, Primary Electrical Distribution System, Recycle Plant, Incinerator Building, Pump House, and 3 fuel tanks |
| People | There have been no recorded injuries or deaths due to tsunamis in Akutan. People could drown, suffer hypothermia, or injure themselves if caught in a tsunami wave. |
| Utilities | There have been no recorded utility disruptions due to tsunamis in Akutan. A tsunami could damage underwater cables, sewer and water lines, and utility poles. |
| Transportation | There have been no recorded impacts to transportation systems due to a tsunami in Akutan. Potential inundation of roadways and airport runways could limit or delay land and air travel, while damage to boat harbors, vessels, and other marine transportation infrastructure could impede travel by water. |
| Economy | There have been no economic impacts due to tsunamis in Akutan. |
| Subsistence Resources | There have been no recorded impacts on subsistence resources due to tsunamis in Akutan. A tsunami could limit access to subsistence fishing grounds during and after an event, or damage land resources if they are inundated. |

### C.4.1.10.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Akutan will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

### C.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in Akutan is not anticipated to change in the future. |
| Location | The location of tsunami events in Akutan is not anticipated to change in the future. All low-lying coastal areas in Akutan will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in Akutan. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in Akutan. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in Akutan. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in Akutan, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in Akutan could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in Akutan, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in Akutan, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area. Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in Akutan. |

### C.4.1.11 Volcano

#### C.4.1.11.1 Location

The entire geography of Akutan is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Akutan.

According to the 2023 State of Alaska HMP, Akutan is located in a **moderate** volcanic ash hazard level area.

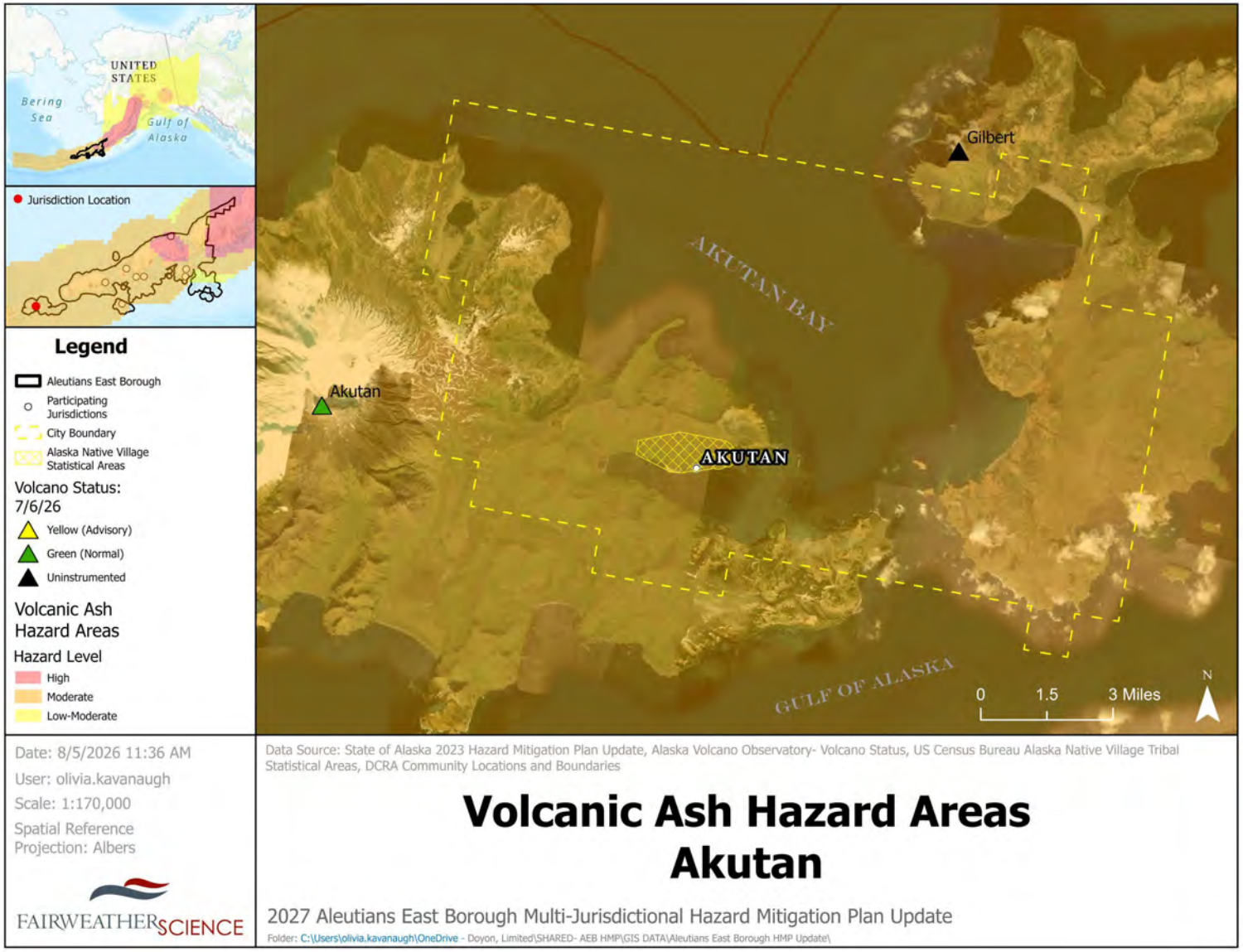



**Figure C-24- Volcanic Hazard Areas in Akutan**

#### C.4.1.11.2 History

Akutan has had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to Akutan is **Mount Akutan**, which has resulted in several eruptions that have impacted the community. Located approximately 8 miles west of Akutan, Mount Akutan has erupted a total of 25 times since 1900 (AVO 2026). Akutan eruptions in 1946, 1951, 1962, 1988, 1989, 1991, and 1992 resulted in trace ash fall being reported in the community. The threat of ashfall was so great during the 1947 eruption that Akutan had to be temporarily evacuated to prevent injury or death (AVO 2026). While the majority of Akutan eruptions resulted in only trace ashfall in the community, an eruption in 1962 resulted in ashfall infiltrating the community water system and covering the village boardwalks.

#### C.4.1.11.3 Extent (Magnitude and Severity)

Akutan is located in relatively close proximity to Mount Akutan, which has produced large eruptions over the past century, and has averaged an eruption approximately every four years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, Akutan has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community. The notable exception occurred in 1962, when an eruption from Mount Akutan impacted the community with a thick layer of ash covering the village boardwalk that required it to be swept (AVO 2026).

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcanoes in Akutan is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### C.4.1.11.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding Akutan has been ashfall. While the majority of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposit (USGS 2015). |
| Infrastructure | Aside from the ashfall on the village boardwalk in 1962, the historical ashfall reported in Akutan has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of Akutan from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. There are no credible reports of any health effects resulting from ashfall infiltrating the community water system during the 1962 eruption of Mount Akutan. |
| Utilities | While the majority of historical volcanic eruptions impacting Akutan have not resulted in significant utility disruptions, reports from the 1962 Mount Akutan eruption indicated that the eruption caused volcanic ash to infiltrate the water system in the community. |
| Transportation | The primary transportation related impact from a volcanic eruption in Akutan is aircraft interruptions. There have been no reports of a volcanic eruption resulting in the closure of the Akun Island Runway. |
| Economy | While volcanic ashfall can disrupt Akutan's economy by disrupting work and transportation, the historical impact has generally been indirect and limited. |
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in Akutan that has impacted the community's access to subsistence resources. |

#### C.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact Akutan.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 7, it is **Highly Likely** that Akutan will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### C.4.1.11.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in Akutan. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in Akutan. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in Akutan. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in Akutan. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in Akutan. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in Akutan. |
| Land Use Development | Future climate conditions are not expected to influence land use development in Akutan. |
| Subsistence Resources | Future climate conditions are not expected to influence Akutan's ability to access subsistence resources. |

### C.4.1.12 Wildland Fire

#### C.4.1.12.1 Location

Akutan is characterized by cool, wet conditions that support predominantly low-growing vegetation. Vegetation around the community consists largely of grasses and low shrubs, with limited tree cover. These vegetation types generally do not represent highly continuous or heavy wildfire fuels, and the cool, moist climate further limits the potential for frequent or severe wildfires.

According to LANDFIRE's (Landscape Fire and Resource Management Planning Tools Project) 2025 Alaska Statewide Wildfire Exposure Assessment, the majority of the Akutan Planning Area is located in an area that is **Minimally Exposed to Wildfire Hazard**. The population center of Akutan is located in an area that is Infrequently Exposed to Wildfire Hazard.

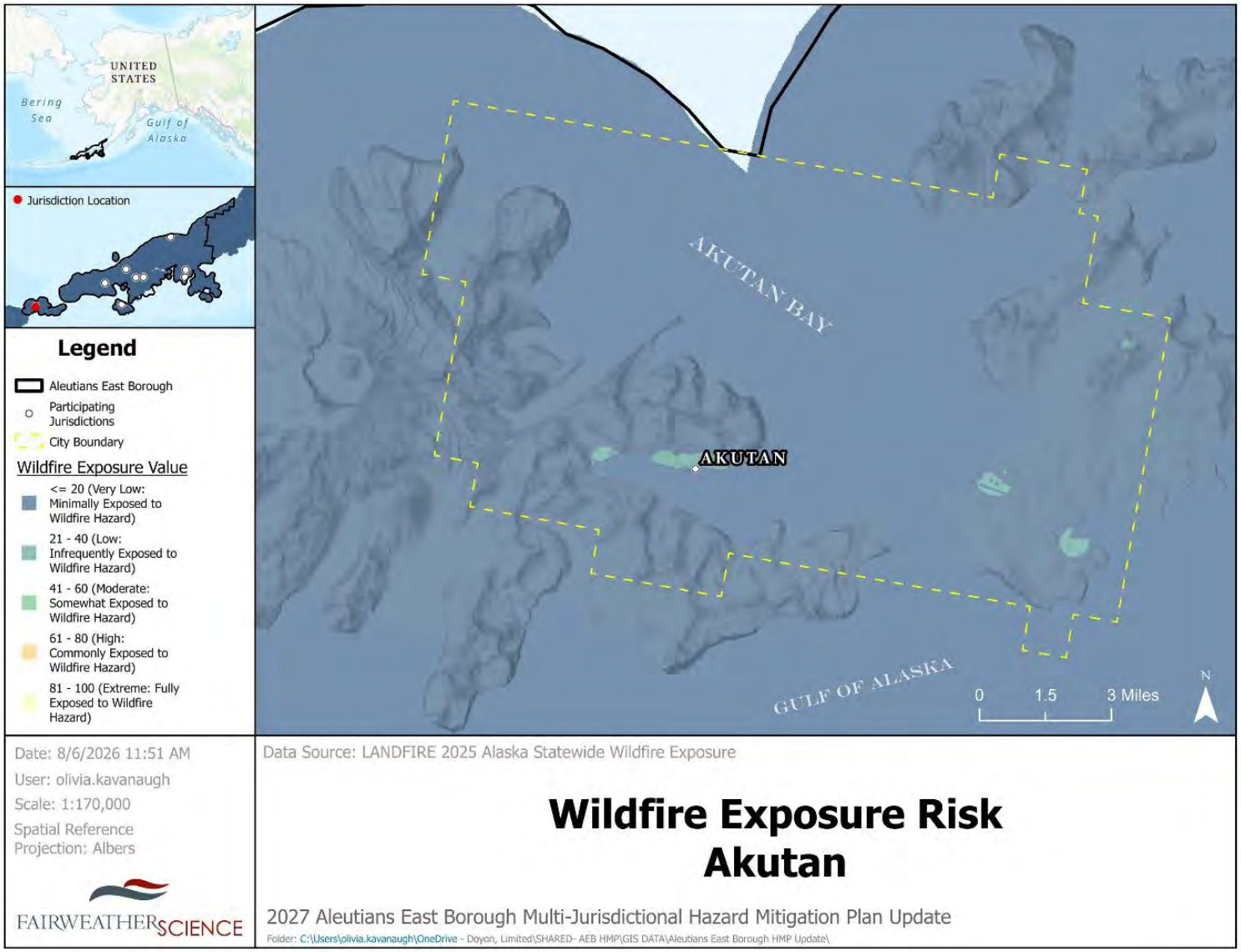



**Figure C-25- Wildfire Exposure Risk- Akutan**

### C.4.1.12.2 History

Table C-4 lists historical fires in and around Akutan from 1939 to December 2025. None of these fires had a confirmed natural cause due to lightning and were all human-caused due to debris burning (AICC 2026). Locations of these events are shown in Figure C-27.

The Planning Team also states there have been several smaller fires near the community incinerator in the past.

There have been no State or Federal disaster declarations in Akutan due to wildfires.

**Table C-4- Historical Wildfires in Akutan (1939 - December 2025)**

| Discovery Date | Name | Prescribed Fire? | Latitude | Longitude | Estimated Total Acres | Cause |
|---|---|---|---|---|---|---|
| June 2007 | - | No | - | - | "about 1 square mile" | Debris Burning-Incinerator |
| 2018-02-20 | Akutan | No | 54.13308 | -165.789 | 17.9 | Debris Burning-Open Trash Burn |
| 2018-02-26 | Trident | No | 54.13303 | -165.788 | 0.5 | Debris Burning-Open Trash Burn |

Source: KUCB Archive 2007, AICC 2026



Source: Alaska's News Source 2018. Photo Credit: Bill Newberry

**Figure C-26- 2018 Fire at Trident Seafoods Facility in Akutan**




Note: the 2007 fire near the incinerator is not included in this map as this event is not in the AICC database

**Figure C-27- Historical Fire Events near Akutan (1939 - December 2025)**

#### C.4.1.12.3 Extent (Magnitude and Severity)

Wildfire can destroy vegetation, negatively impact air quality, and leave land scarring that could increase the risk of landslides, flood, and sediment deterioration/land destabilization.

The largest fire near Akutan occurred near the Trident Seafoods facility and burned nearly 18 acres of grassy hillside in February 2018. This fire was due to an open trash burn. Another fire occurred at the facility six days later and burned 0.5 acres. This fire was also due to an open trash burn.

A fire near the community incinerator burned about 1 square mile of land in Akutan in June 2007. The fire burned for about four hours and burned itself out before it reached the town (KUCB Archive 2007).

Based on the extent of past wildfire events and the criteria identified in Table 5 of the Base Plan, the extent of wildfire in Akutan is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### C.4.1.12.4 Impact

Two historic fire events in Akutan were located at the Trident Seafoods processing facility, about a quarter mile from town. The plant was not damaged in these fires, but the grassy hillside above the facility was burned. The VPSO at the time, Monte Chitty, stated that it rained the night before, which likely reduced the overall spread and impact of the fire (Alaska's News Source 2018). He also noted that if the winds were blowing in a different direction, high winds that spread that fire could have easily driven the fire directly at the village (Alaska's News Source 2018).

In the future, impacts from wildfire could destroy homes, subsistence resources such as berries or other edible plants, and threaten lives.

Wildland fires can cause air transportation impacts including damage to structures that support air travel and fire fighting equipment and personnel. Smoke from wildland and urban fires can disrupt air transportation and in extreme scenarios, fire can damage runway areas making them not suitable for aircraft arrivals and departures.

#### C.4.1.12.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Akutan will experience a wildfire event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### C.4.1.12.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of wildland fires in the Akutan Planning Area is not anticipated to change in respect to future climate conditions. |
| Location | The location of wildland fires in the Akutan Planning Area is anticipated to change slightly in respect to future climate conditions, as some areas see a higher likelihood of burning than in the past. |
| Extent (Magnitude and Severity) | Due to future climate conditions, the extent (magnitude and severity) of wildland fires is expected to increase in Alaska in general. Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050 (EPA 2022). In the AEB, more acreage is trending from "less likely to burn" to "more likely to burn" (UAF IARC 2026). |
| Impact | Due to future climate conditions, the impact of wildland fires on the Akutan Planning Area may increase. More frequent fires due to a change in future conditions may increase the risk of health hazards and low visibility posed by the increase of smoke (AFSC 2025). |

| Description of Future Conditions | |
|---|---|
| Probability of Future Events | Future climate conditions within Alaska are likely to result in increased drought and longer fire seasons. Shifts in vegetation will influence the intensity and frequency of fires (IPCC 2019). A warming climate is also projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018).<br>Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050, however this is most applicable to Alaska's most fire-prone regions in the interior (EPA 2022). |
| Population Patterns | Wildland fires due to future climate conditions are not anticipated to impact population patterns in the Akutan Planning Area. |
| Land Use Development | Wildland fires due to future climate conditions may influence the location of future development in areas with higher fire risk, although in most areas with year-round populations and infrastructure, the wildfire risk is expected to remain low. |
| Subsistence Resources | A warming climate is projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018). |

## C.4.2 Critical Facilities

**Table C-5- Critical Facilities- Native Village of Akutan**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Native Village of Akutan | Government | 5 | Tribal Office | Boardwalk | 54.13483395 | -165.772671 | $500,000 | Unknown | Native Village of Akutan | Native Village of Akutan | | x | x | | x | x | x | x | x | x | x | |
| 2 | Native Village of Akutan | Commercial | 20 | Salmonberry Inn | Boardwalk | 54.13426 | -165.774691 | $2,000,000 | W1 | Akutan Corporation | Unknown | | x | x | | x | x | x | x | x | x | | |
| 3 | Native Village of Akutan | Commercial | 10 | Surf Inn Bunkhouse & Staff Quarters | Akun Island | 54.14768709 | -165.6066124 | $846,481 | | | | | | x | | x | | x | | x | x | | |
| 4 | Native Village of Akutan | Commercial | 10 | Surf Inn Kitchen and Bath | Akun Island | 54.14742315 | -165.6068914 | $458,058 | | | | | | x | | x | | x | | x | x | | |
| 5 | Native Village of Akutan | Commercial | 2 | Resident Manager's House | Akun Island | 54.14768079 | -165.6074707 | $313,025 | | | | | | x | | x | | x | | x | x | | |
| 6 | Native Village of Akutan | Community | 20 | Akutan Tsunami Shelter/ Community Center | Foot trail | 54.134061 | -165.77975 | $1,313,000 | Wood | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | | |
| 7 | Native Village of Akutan | Community | 0 | Boardwalk System | throughout the community | throughout the community | throughout the community | $10,000,000 | Wooden boardwalk | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 8 | Native Village of Akutan | Community | 20 | Multi Purpose/ Museum/Library | 113 Boardwalk | 54.13529 | -165.769302 | $2,977,600 | Wood | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | x | |
| 9 | Native Village of Akutan | Community | 10 | City Administrative Building | 109 Windy Way | 54.1343 | -165.773404 | $2,958,896 | Wood | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 10 | Native Village of Akutan | Community | 10 | Day Care Facility | | 54.13528188 | -165.7694923 | $2,522,089 | | | | | x | x | | x | x | x | x | x | x | x | |
| 11 | Native Village of Akutan | Community | 20 | Recreation Center | 113 Boardwalk | 54.135339 | -165.769891 | $2,000,000 | Unknown | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | x | |
| 12 | Native Village of Akutan | Community | 5 | Cemetery - Nic Sias Memorial Landing | | 54.134191 | -165.778348 | $1,000,000 | | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 13 | Native Village of Akutan | Community | 0 | Akutan Church Cemetery | 14 Boardwalk | 54.133476 | -165.775222 | $1,000,000 | Unknown | Church | Church | | x | x | | x | x | x | x | x | x | | |
| 14 | Native Village of Akutan | Community | 10 | VPSO/Jail | | 54.13506448 | -165.7715562 | $552,178 | Wood | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 15 | Native Village of Akutan | Community | 0 | Akutan Roadhouse | Foot trail | 54.133859 | -165.777429 | $500,000 | Unknown | Akutan Corporation | City of Akutan | | x | x | | x | x | x | x | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | Native Village of Akutan | Community | 0 | McGlashan Store | Foot trail | 54.133699 | -165.777088 | $500,000 | Unknown | Akutan Corporation | Unknown | | x | x | | x | x | x | x | x | x | | |
| 17 | Native Village of Akutan | Community | 0 | St. Alexander Nevsky Church | 14 Boardwalk | 54.133404 | -165.775019 | $100,000 | Unknown | Church | Church | | x | x | | x | x | x | x | x | x | | |
| 18 | Native Village of Akutan | Educational | 100 | School | 202 Volcano Dr | 54.13499 | -165.772118 | $7,361,187 | Unknown | Aleutians East Borough | Unknown | | x | x | | x | x | x | x | x | x | x | |
| 19 | Native Village of Akutan | Government | 20 | City Hall | 113 Boardwalk | 54.13451 | -165.77318 | $2,958,896 | Wood | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | x | |
| 20 | Native Village of Akutan | Government | 10 | Public Safey Office | 89 Boardwalk | 54.134038 | -165.773604 | $552,178 | Unknown | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | | |
| 21 | Native Village of Akutan | Government | 0 | Equipment Warehouse | 100 Windy Way | 54.1343 | -165.773404 | $215,388 | Wood | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 22 | Native Village of Akutan | Medical | 10 | Clinic | 89 Boardwalk | 54.134188 | -165.773776 | $2,069,620 | Wood | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 23 | Native Village of Akutan | Transportation | 0 | Akutan Harbor Float (Small Boat Harbor) | 101 Salmon Berry Rd | 54.133339 | -165.777576 | $60,000,000 | Marine Structure | City of Akutan | City of Akutan | | x | x | x | x | x | x | | x | x | | |
| 24 | Native Village of Akutan | Transportation | 5 | Akutan Airport | Akun Island | 54.14564381 | -165.6055076 | $20,000,000 | Airport | State of AK | State of AK | | | x | | | | x | | x | x | | |
| 25 | Native Village of Akutan | Transportation | 0 | Akutan Helicopter Hanger | n/a | 54.13173 | -165.824014 | $5,336,820 | S3 | AEB | City of Akutan, Aleut Corporation, Akutan Corporation, AEB | | | x | | x | | x | x | x | x | | |
| 26 | Native Village of Akutan | Transportation | 0 | Public Dock Facility | 101 Salmon Berry Rd | 54.133229 | -165.777265 | $5,220,791 | Marine Structure | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | | |
| 27 | Native Village of Akutan | Transportation | 0 | Seaplane Base Ramp | | 54.133834 | -165.778411 | $2,000,000 | Concrete | State of AK | State of AK | | x | x | | x | x | x | | x | x | | |
| 28 | Native Village of Akutan | Transportation | 0 | New Boat Harbor House | | 54.131894 | -165.8238548 | $266,640 | | | | | | x | | x | | x | x | x | x | | |
| 29 | Native Village of Akutan | Transportation | 0 | Airport Shed | Foot Trail | 54.133918 | -165.777654 | $5,000 | Unknown | State of AK | State of AK | | x | x | | x | x | x | x | x | x | | |
| 30 | Native Village of Akutan | Utilities | 0 | Communication Tower - GCI | Foot Trail | 54.133564 | -165.776743 | $20,000,000 | Steel Tower | GCI | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 31 | Native Village of Akutan | Utilities | 0 | Communication Tower - ATT | Foot Trail | 54.133189 | -165.776217 | $20,000,000 | Steel Tower | ATT | City of Akutan | | x | x | | x | x | x | x | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Native Village of Akutan | Utilities | 0 | Communication Tower - ACS | Foot Trail | 54.133161 | -165.77631 | $20,000,000 | Steel Tower | ACS | City of Akutan | | x | x | x | x | x | x | x | x | x | | |
| 33 | Native Village of Akutan | Utilities | 0 | Akutan Hydro Dam | | 54.14264 | -165.77405 | $20,000,000 | Concrete dam | City of Akutan | City of Akutan | | x | x | | | x | x | | x | x | x | |
| 34 | Native Village of Akutan | Utilities | 0 | Wind Farm | Boardwalk | 54.135377 | -165.768326 | $10,000,000 | Unknown | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 35 | Native Village of Akutan | Utilities | 0 | Warehouse | | 54.13507836 | -165.7715347 | $6,193,691 | | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 36 | Native Village of Akutan | Utilities | 0 | Bulk Fuel Storage (new) | | 54.13393632 | -165.7787358 | $3,091,840 | Steel Tank | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 37 | Native Village of Akutan | Utilities | 0 | Harbor Power House (inside electric plant) | | 54.13347377 | -165.7770646 | $2,413,594 | Utility Building | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 38 | Native Village of Akutan | Utilities | 0 | Fuel Tank | Foot Trail | 54.133301 | -165.776055 | $2,000,000 | Steel tank | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 39 | Native Village of Akutan | Utilities | 0 | Water Storage Tank | | 54.13617 | -165.770777 | $2,000,000 | Unknown | City of Akutan | City of Akutan | | x | x | | x | x | x | | x | x | x | |
| 40 | Native Village of Akutan | Utilities | 0 | Hydro Generator/Generator | Boardwalk | 54.135167 | -165.770497 | $1,344,385 | Steel | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | x | |
| 41 | Native Village of Akutan | Utilities | 0 | Generator Building | Foot Trail | 54.133304 | -165.775941 | $1,084,902 | Steel | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 42 | Native Village of Akutan | Utilities | 0 | Water Treatment Plant | Boardwalk | 54.135074 | -165.771554 | $964,166 | Wood | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 43 | Native Village of Akutan | Utilities | 0 | Sewer System | | throughout the community | throughout the community | $904,486 | | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 44 | Native Village of Akutan | Utilities | 0 | Primary Electrical Distribution System | | 54.1328993 | -165.783133 | $798,118 | Utility Infrastructure | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 45 | Native Village of Akutan | Utilities | 0 | Akun Island Fuel Tank Farm | Akun Island | 54.147863 | -165.6081252 | $785,325 | | | | | | x | | x | | x | | x | x | | |
| 46 | Native Village of Akutan | Utilities | 0 | Harbor Outside Electric Plant | | 54.13347377 | -165.7770646 | $621,976 | Utility Building | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 47 | Native Village of Akutan | Utilities | 0 | Recycle Plant | Boardwalk | 54.135444 | -165.76327 | $500,000 | Unknown | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 48 | Native Village of Akutan | Utilities | 0 | Harbor Power Fuel Tank Farm | | 54.13254776 | -165.7856896 | $479,364 | Steel Tank | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49 | Native Village of Akutan | Utilities | 0 | Incinerator Building (old) | Boardwalk | 54.135013 | -165.770779 | $339,601 | Steel | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| 50 | Native Village of Akutan | Utilities | 0 | Pumphouse | | 54.1328365 | -165.7830136 | $176,011 | | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 51 | Native Village of Akutan | Utilities | 0 | Fuel Tanks- (3) 10,000 gallon capacity | Trident Way | 54.13249 | -165.78592 | $160,859 | Steel tank | City of Akutan | Unknown | | x | x | | x | x | x | x | x | x | | |
| 52 | Native Village of Akutan | Utilities | 0 | Garage | Foot Trail | 54.133168 | -165.775833 | $128,696 | Wood | City of Akutan | City of Akutan | | x | x | | x | x | x | x | x | x | | |
| 53 | Native Village of Akutan | Utilities | 0 | Street Lights | | throughout the community | throughout the community | $41,642 | | City of Akutan | City of Akutan | | x | x | x | x | x | x | x | x | x | x | |
| **Total Occupants:** | | | **287** | **Total Estimated Value:** | | | | **$249,556,503** | | | | | | | | | | | | | | | |

* Values in **bold** are known insured values for listed facilities. Values that are *italicized* are estimated.

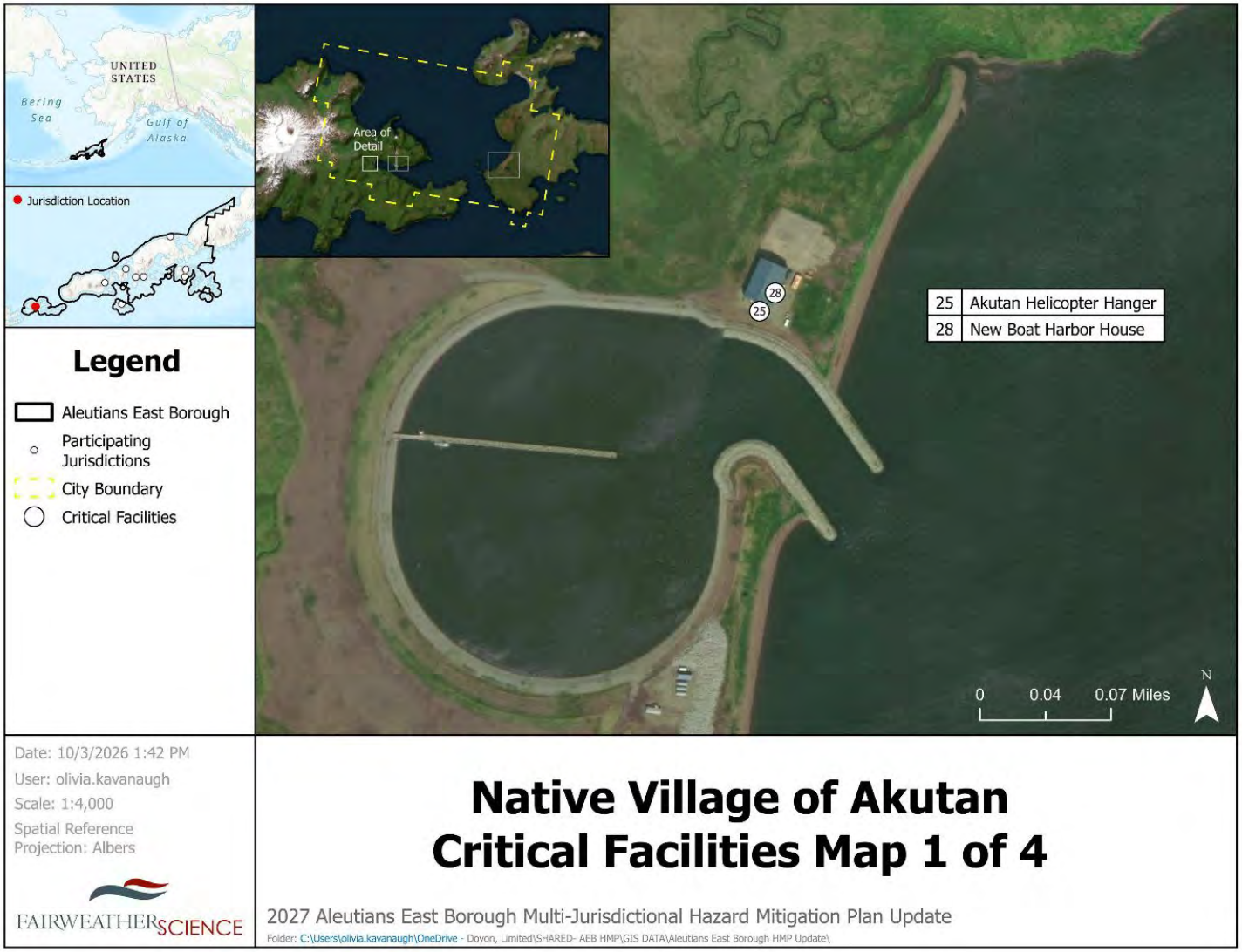



**Figure C-28- Native Village of Akutan Critical Facilities Map 1 of 4**

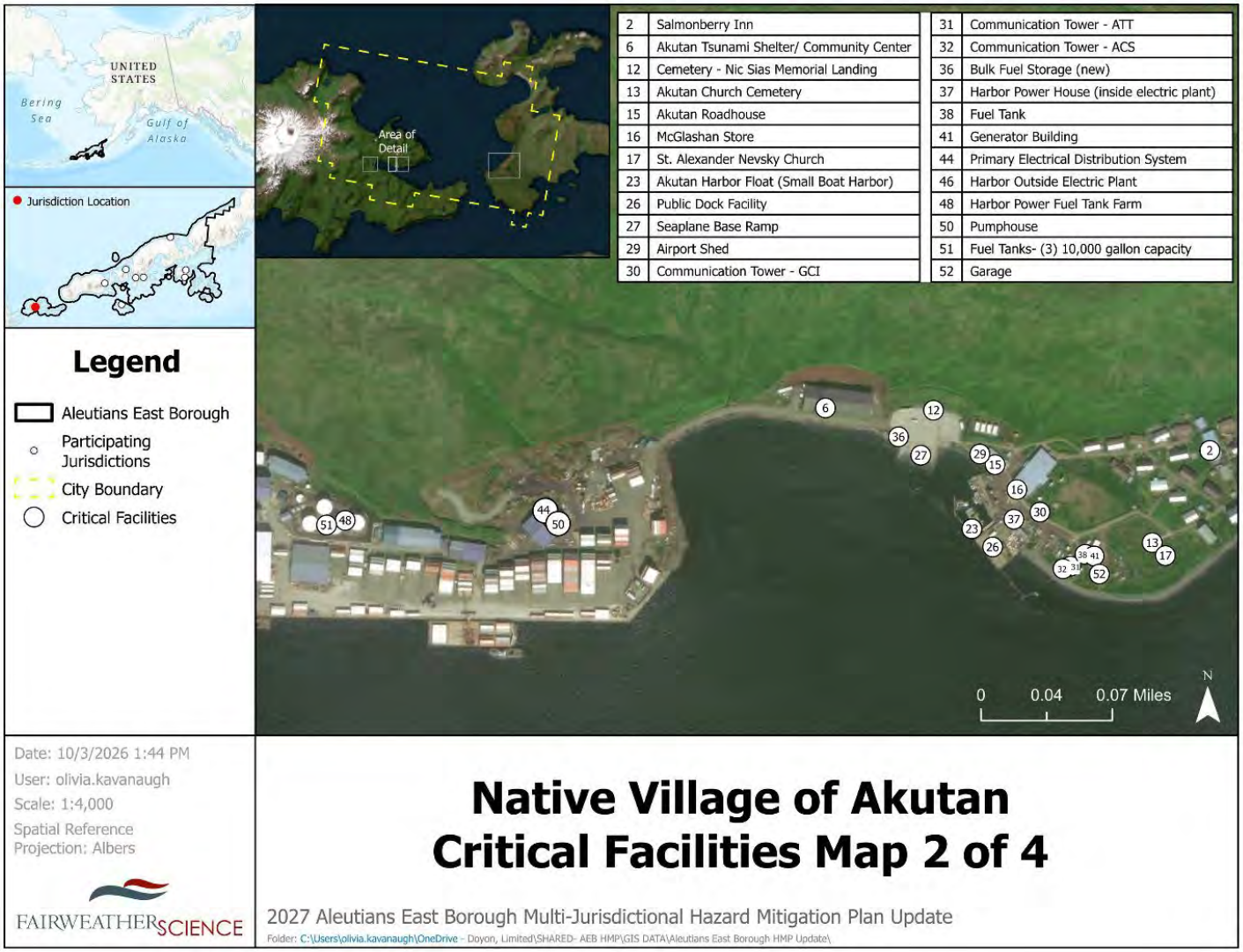



**Figure C-29- Native Village of Akutan Critical Facilities Map 2 of 4**

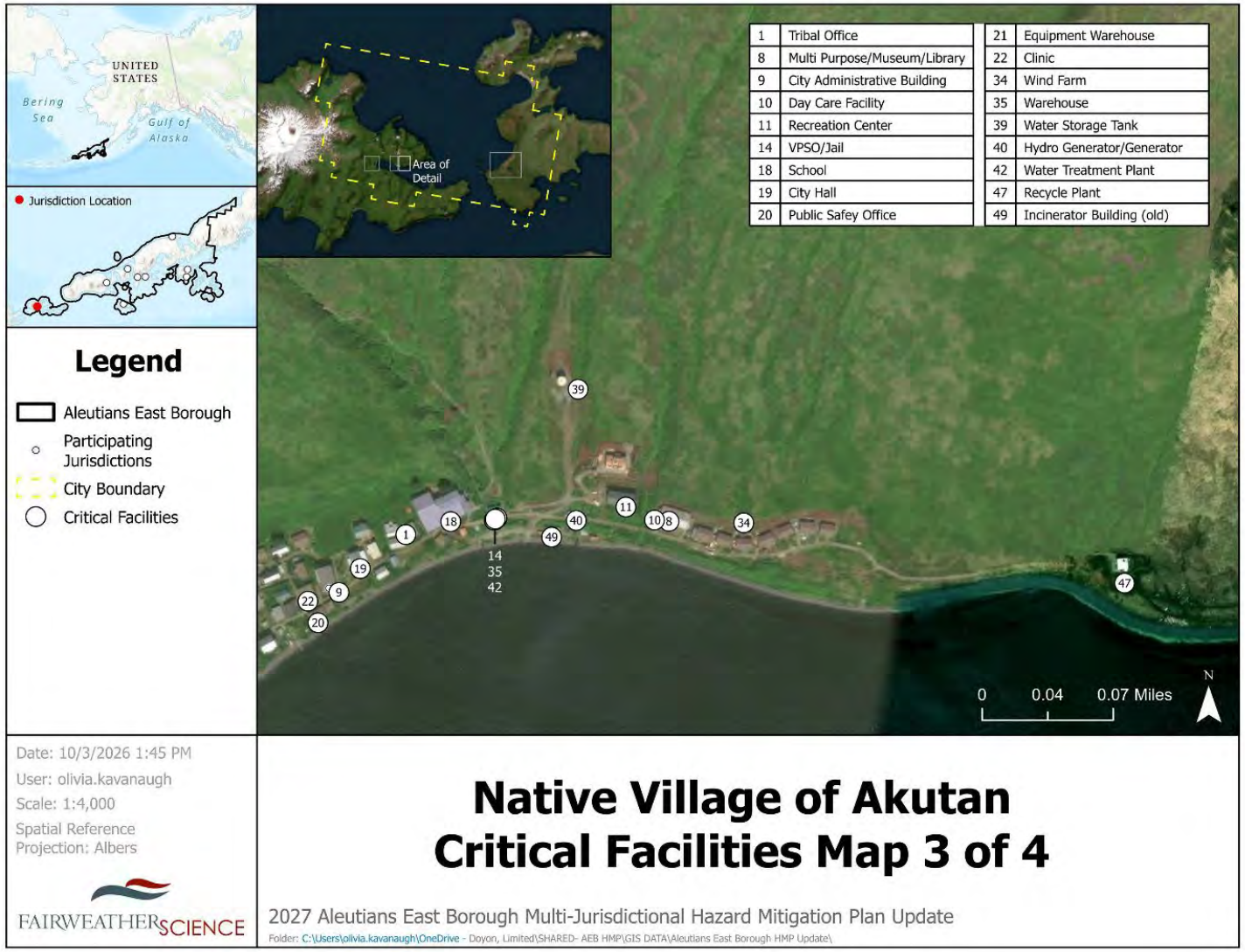



**Figure C-30- Native Village of Akutan Critical Facilities Map 3 of 4**

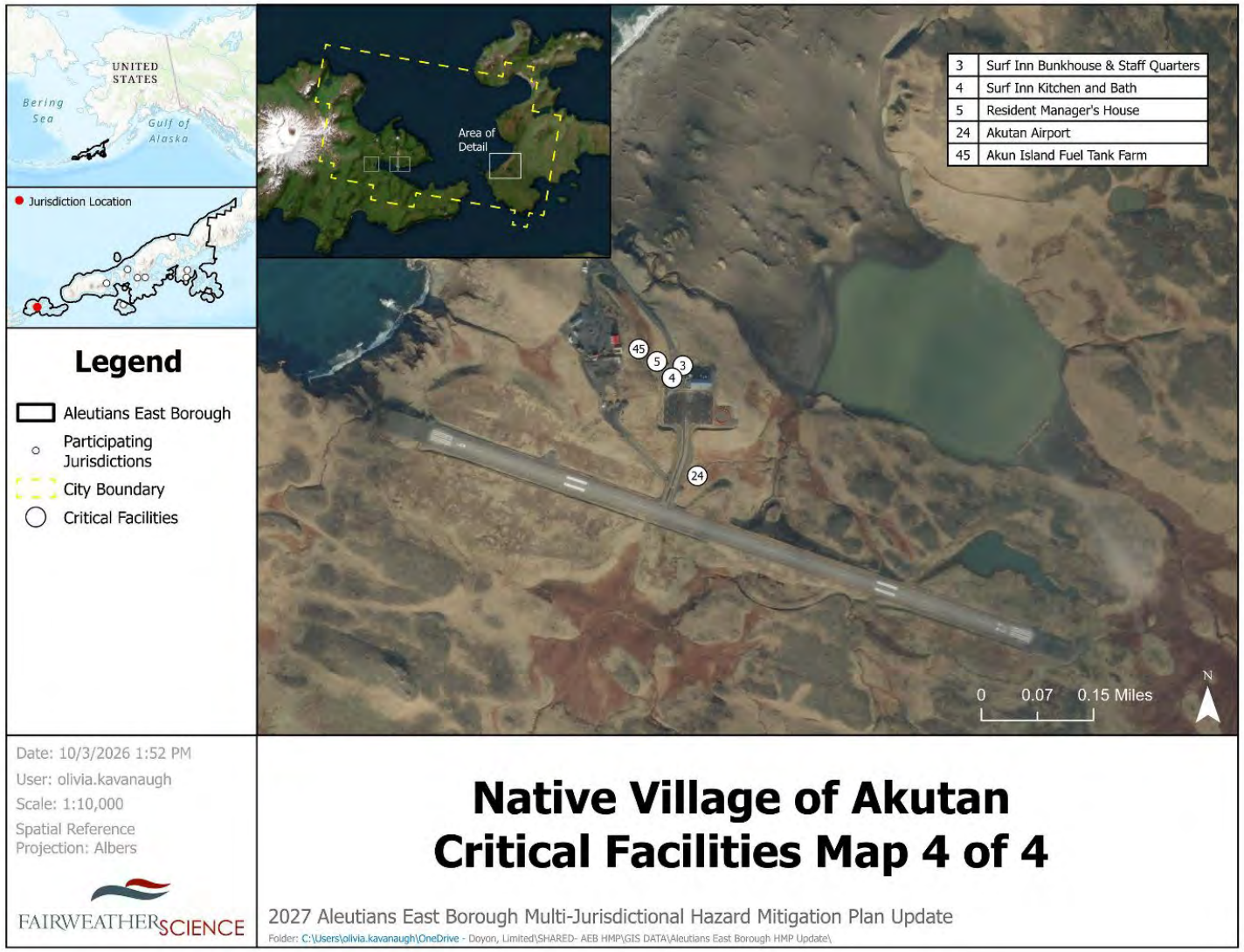



**Figure C-31- Native Village of Akutan Critical Facilities Map 4 of 4**

## C.4.3 Summary of Vulnerability

**Table C-6- Jurisdictional Summary of Vulnerability- Native Village of Akutan**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere- Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere- Snow Avalanche | 46 | 260 | $221,550,154 | 38 | 152 | $27,545,744 |
| Earthquake | 53 | 287 | $249,556,503 | 38 | 152 | $27,545,744 |
| Sediment Deterioration and Land Destabilization | 14 | 50 | $109,256,017 | 4 | 16 | $2,899,552 |
| Flood | 51 | 282 | $209,556,503 | 38 | 152 | $27,545,744 |
| Ground Failure/ Landslide | 46 | 260 | $221,550,154 | 38 | 152 | $27,545,744 |
| Severe Weather | 53 | 287 | $249,556,503 | 38 | 152 | $27,545,744 |
| Tsunami | 44 | 260 | $143,153,614 | 38 | 152 | $27,545,744 |
| Volcano | 53 | 287 | $249,556,503 | 38 | 152 | $27,545,744 |
| Wildland Fire | 53 | 287 | $249,556,503 | 38 | 152 | $27,545,744 |
| Dam Failure | 18 | 195 | $63,834,205 | 8 | 32 | $5,799,104 |
| Invasive Species | 0 | 0 | $0 | 0 | 0 | $0 |

The Native Village of Akutan's vulnerability to natural hazards extends beyond potential damage to buildings and infrastructure. Community-provided information identifies subsistence access and activities as vulnerable to severe weather, coastal flooding, tsunamis, earthquakes, volcanic ashfall, transportation disruptions, and changing environmental conditions. Hazards may affect the ability to safely reach harvesting areas and may also affect resources, access routes, or facilities used for harvesting and processing. These community values and functions are not fully represented in the quantitative exposure estimates above.

## C.5 Capability Assessment

***Note: the Native Village of Akutan does not participate in the National Flood Insurance Program (NFIP).***

| Planning and Regulatory Tools | |
|---|---|
| **Plans** | **Existing?** |
| Comprehensive/ Master Plan | City – Yes, Tribe- No |
| Capital Improvements Plan | No |
| Economic Development Plan | No |
| Emergency Operations Plan or Small Community Emergency Operations Plan | Yes- SCERP |
| Transportation Plan | No- Boardwalk system |
| Housing Plan | No- Houses are built close together |
| Hazard-specific plans or studies | Yes- 2026 PND Akutan Erosion Project, tsunami inundation mapping |
| **Land Use Planning and Ordinances or Practices** | |
| **Ordinance/Practice** | **Existing?** |
| Zoning Ordinance | City- Yes, Tribe- No |
| Subdivision Ordinance | City- Yes, Tribe- No |
| Building Codes | No |
| Natural Hazard Specific Ordinance or Practices (Stormwater, Steep Slopes, Wildfire) | No |
| Acquisition of Land for Open Space and Public Recreation Uses | No |
| Maintenance Programs to Reduce Risk, E.G., Tree Trimming, Clearing Drainage Systems | No |
| Other | Tribe got funding to redo windows and roofs. Windows are rated for high winds. |
| **Administrative and Technical** | |
| **Resource** | **Existing?** |
| Tribal Council/ Governing Body | Yes |
| Tribal Chief Executive | No |
| Mitigation Planning Committee | Yes, but not a formal Committee. Established to complete HMP Update.<br>Clinic has emergency response and preparedness |
| Business Committees | No |
| Mutual Aid Agreements | No |

| Administrative and Technical | |
|---|---|
| **Resource** | **Existing?** |
| Code Inspector | No |
| Environmental/Natural Resources Specialist | Yes |
| Emergency Manager | Clinic/VPSO- Need more capacity |
| Community Planner | No |
| Housing Specialist | Yes- utilize Aleutian Housing Authority |
| Engineer | No |
| Historian/ Cultural Advisor | Yes- need more staff |
| Financial or Grants Specialist | Yes- need more financial staff |
| Administrative Staff Person | Yes |
| Other- Tribal Transportation Coordinator | Yes |
| Other- IGAP Coordinator | Yes |
| Warning Systems/ Services | Yes- Tsunami siren (owned by the City) |
| Hazard Data/Information | Yes- this HMP |
| Grant Writing | Yes |
| Geographic Information Systems (GIS) Analysis | Yes- but need additional training/capacity |

| Financial | |
|---|---|
| **Resource** | **Existing?** |
| Capital Improvements Project Funding | No |
| Gaming Revenue, Enterprise Revenues | No |
| Fees For Water, Sewer, Gas, or Electric Services | No |
| Fees From Festivals, Campsites, and Recreational Areas | No |
| Permits and Other Fees | No |
| Federal Funding (BIA, HUD) | Yes |
| Contract Services | Yes |

| Education and Outreach | |
|---|---|
| **Program/Organization** | **Existing?** |
| Gatherings, Festivals, Celebrations and/or Meetings | Yes- holiday celebrations, Culture Camp |
| Natural Disaster or Safety- Related School Programs | Yes- school cultural programming |
| Fire Safety Programs | Yes- Through Clinic and VPSO |

Local knowledge and experience also contribute to community hazard awareness and preparedness. Community members have longstanding experience with earthquakes, tsunamis, volcanic activity, high winds, heavy rainfall, coastal storms, avalanches, and other hazards affecting Akutan. Continued documentation of locally observed hazard conditions can complement technical hazard information and help identify changes that may not be represented in available datasets.

The Planning Team also identified limitations in local capacity to address invasive species. Although the Tribe has environmental program experience, community-provided information indicates that invasive-species concerns remain unresolved.

# C.6 Mitigation Strategy

## C.6.1 Mitigation Goals

The Native Village of Akutan's mitigation goals are:

1. Reduce potential earthquake vulnerability, damage, and loss.
2. Reduce potential tsunami vulnerability, damage, and loss.
3. Reduce potential volcano vulnerability, damage, and loss.
4. Reduce potential severe weather vulnerability, damage, and loss.
5. Reduce potential flooding, coastal erosion, ground failure/landslide, shoreline instability, and dam failure vulnerability, damage, and loss by protecting critical infrastructure, utilities, transportation corridors, and community facilities.
6. Reduce potential changes in the cryosphere, including snow avalanche vulnerability, damage, and loss.
7. Reduce potential vulnerability, damage, and loss associated with invasive species.

## C.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

This is the first edition HMP for the Native Village of Akutan.

As such, there is no previous HMP and no previously identified mitigation actions for the jurisdiction to provide a status update.

Future plan updates will document the status and progress of mitigation actions identified in this HMP.

## C.6.3 2027 Mitigation Action Plan

**Table C-7- 2027 Mitigation Action Plan- Native Village of Akutan**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | Cryosphere - Snow Avalanche | Support the mapping of avalanche hazard zones, including identifying where people, buildings, roads, and utilities may be at risk. | L | Grant Writing Director | HMA, USACE, Alaska DHS&EM EMPG, Denali Commission, USGS EHP, HUD CDBG, DGGS, University | Other | All | 5-10 years | B/C: Mapping supports cost-effective mitigation; moderate study costs. TF: Identification of funding/TA partner and scoping of mapping project needed. | Future Plans: Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **2** | Cryosphere - Snow Avalanche | Support the installation of warning signage in known avalanche zones. | M | Grant Writing Director | City, HMA, Denali Commission, Alaska DHS&EM EMPG | Education and Awareness Programs | All | 5-10 years | B/C: Very low-cost life-safety improvement. TF: Phase with avalanche zone mapping. | Future Plans: Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **3** | Cryosphere - Snow Avalanche | Develop an avalanche inventory documenting historic avalanche locations, frequency, size, damage, road closures, and near misses. | L | Grant Writing Director | City, APIA, HMA, Alaska DHS&EM EMPG, Denali Commission, HUD CDBG | Other | All | 5-10 years | B/C: Mapping supports cost-effective mitigation; moderate study costs. TF: Identification of funding/TA partner and scoping of mapping project needed. | Future Plans: Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **4** | Dam Failure | Support formal dam failure inundation mapping for Akutan Hydro (Town Creek Hydroelectric) Dam. | L | Grant Writing Director | HMA, USACE, Alaska DHS&EM EMPG, ANTHC | Other | Akutan Hydro Dam, Other | 5-10 years | B/C: Mapping informs cost-effective mitigation; modeling requires technical expertise. TF: Phased funding likely not needed for dam inundation mapping. | Future Plans: Comprehensive Plan, Stormwater Management Plan, Land Use Plan, Local Emergency Operations Plan |
| **5** | Dam Failure | Support the development of a Dam Emergency Action Plan (EAP) for the Akutan Hydro Dam in the event of a dam failure. This would include identifying homes, roads, bridges, buildings, and critical facilities that could be affected by flooding following a dam failure and implement mitigation plans/procedures for affected residents & infrastructure. | M | Grant Writing Director | HMA, USACE, Alaska DHS&EM EMPG, Denali Commission, ANTHC | Plans and Regulations | Akutan Hydro Dam, Other | 3-4 years | B/C: High life-safety benefit; cost low for planning compared to risk reduction. TF: Phased funding for planning and studies to determine feasibility of implementation. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan, Local Emergency Operations Plan |
| **6** | Dam Failure | Consider mitigation measures to protect critical facilities that are in the estimated dam inundation area. | L | Grant Writing Director | HMA, USACE, Alaska DHS&EM EMPG, Denali Commission | Structure and Infrastructure Projects | Critical Facilities in the Estimated Dam Inundation Area | 5-10 years | B/C: Prevents severe losses; cost depends on facility-specific solutions. TF: Phased funding for assessments and engineering solutions. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan, Local Emergency Operations Plan |
| **7** | Earthquake | Support the seismic retrofitting of critical facilities. | L | Grant Writing Director | FEMA, HUD ICDBG, Denali Caommission, USGS | Structure and Infrastructure Projects | All | 5-10 years | B/C: Seismic retrofits reduce life-safety risk and future repair costs and can be cost-effective when focused on the most vulnerable structures. TF: This project is technically feasible and would require phase funding for engineering and design. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **8** | Flood | Support the evaluation of flood mitigation strategies to protect waterfront infrastructure. | L | Grant Writing Director | HMA, USACE, NOAA, EDA, Alaska DHS&EM, BIA, ANTHC, Denali Commission | Other | Waterfront Infrastructure | 5-10 years | B/C: Assessments can help strategic future investments that mitigate flood risk. TF: Technically feasible and can be phased with partner support. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **9** | Flood | Support the installation of geodetically referenced, permanent, real-time water level gauge and wave buoys. | L | Grant Writing Director | NOAA/NWS, HMA, USACE, USGS CMHP, Denali Commission, Alaska DHS&EM EMPG, AOOS | Other | Monitoring Equipment | 5-10 years | B/C: Improves early warnings and reduces damages; costs moderate with ongoing O&M. TF: Partnerships and regional monitoring models likely to help with funding and implementation. | Future Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **10** | Flood | Support coastal flood assessments to identify flood-prone areas and vulnerable facilities. | L | Grant Writing Director | HMA, USACE, NOAA, EDA, Alaska DHS&EM, BIA, ANTHC, Denali Commission | Other | All | 5-10 years | B/C: Assessments can help strategic future investments that mitigate flood risk. TF: Technically feasible and can be phased with partner support. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **11** | Ground Failure/Landslide | Support the installation of warning signs in landslide-prone areas. | M | Grant Writing Director | HMA, EMPG, Alaska DOT | Education and Awareness Programs | All | 0-2 years | B/C: Warning signs can reduce injuries and emergency response costs by alerting people to hazardous zones. TF: This project is technically feasible using standard sign installation and mapping of known hazard areas. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **12** | Ground Failure/Landslide | Support the mapping of historic landslide hazard zones, including identifying where people, buildings, roads, and utilities may be at risk. | M | Grant Writing Director | USGS, HMA, Denali Commission, Alaska DGGS | Other | All | 3-4 years | B/C: Mapping improves land-use and development decisions and reduces future losses to landslides. TF: This project is technically feasible using GIS, USGS methods, and tribal/local field verification. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **13** | Ground Failure/Landslide | Create educational programming targeted at seasonal workers and visitors who may not be familiar with the hazards associated with recreating in Akutan. Identify and educate on hazards. | M | Grant Writing Director | EMPG, Fisheries Industry, APIA, THSGP, Alaska DHS&EM | Education and Awareness Programs | All | 3-4 years | B/C: Education reduces accident risk and emergency response costs among non-residents. TF: This project is technically feasible using existing visitor centers, seasonal employer networks, and local outreach capacity. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **14** | Invasive Species | Support the development of a community-based platform for sharing/documenting invasive species, weather events, and other hazards based upon existing platforms like the LEO network, SIKU app, Sentinels/guardians programs. | L | Grant Writing Director | BIA Tribal Resilience, NOAA, USFWS, USDA, EMPG | Other | N/A | 5-10 years | B/C: A centralized platform improves reporting and early detection, reducing future management costs. TF: This project is technically feasible using existing regional platforms and local training. | Future Plans: Comprehensive Plan, Environmental Planning |
| **15** | Invasive Species | Consider the feasibility of a community-based monitoring program of invasive plants, including creeping buttercup, Italian ryegrass, and tall buttercup. | M | Grant Writing Director | USDA NRCS, USFWS, NOAA, BIA, UAA | Other | N/A | 3-4 years | B/C: Community participation can reduce long-term invasive species spread and costly future eradication efforts. TF: This project is technically feasible using simple field protocols and existing volunteer or tribal natural-resource programs. | Future Plans: Comprehensive Plan, Environmental Planning |
| **16** | Invasive Species | Invest in invasive species education throughout the community (website, public info signs at popular outdoor recreation sites/trailheads). | M | Grant Writing Director | Tribe, NOAA, USDA | Education and Awareness Programs | Trailheads and Recreation/Subsistence Sites | 0-2 years | B/C: Education reduces plant spread and avoids future high-cost control and restoration efforts. TF: This project is technically feasible using existing communication channels and low-cost signage. | Future Plans: Comprehensive Plan, Environmental Planning |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **17** | Sediment Deterioration and Land Destabilization | Map hazard areas impacted by erosion for home construction, surveying areas to support new housing development. | H | Grant Writing Director | USACE, NOAA, HMA, Denali Commission, ANTHC | Other | All | 3-4 years | B/C: Mapping helps avoid high-risk areas and reduces long-term infrastructure and housing repair costs. TF: This project is technically feasible using coastal erosion surveys, GIS, and local field data. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **18** | Sediment Deterioration and Land Destabilization | Support securing funding to implement the mitigation measures recommendations by PND Engineers reduce possible impacts of erosion affecting homes and critical infrastructures in Akutan. The priority is addressing the erosion area near the library. | H | Grant Writing Director | HMA, USACE, Denali Commission, ANTHC | Structure and Infrastructure Projects | Library, Other | 3-4 years | B/C: Erosion mitigation prevents costly future damage; construction cost depends on design complexity. TF: The Tribe and City will need phase funding to obtain engineering and design expertise to determine project viability and then move into implementation funding. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **19** | Sediment Deterioration and Land Destabilization | Evaluate and implement long-term erosion control measures to protect critical infrastructure. | M | Grant Writing Director | HMA, USACE, Denali Commission, ANTHC | Structure and Infrastructure Projects | All | 5-10 years | B/C: Long-term controls reduce repetitive loss; initial costs can be high. TF: Multi-year phasing | Future Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **20** | Sediment Deterioration and Land Destabilization | Support efforts to evaluate storm damage on a bridge necessary to move people and supplies on Akun island, and support efforts to upgrade this bridge and address nearby erosion issues in that location. | H | Grant Writing Director | HMA, USACE, Denali Commission, ANTHC | Structure and Infrastructure Projects | Bridge | 5-10 years | B/C: Bridge upgrades reduce isolation risk; costs depend on structural extent and dune stabilization. TF: Phased funding for assessment, design, and construction. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **21** | Severe Weather | Conduct special awareness activities in partnership with the City, with a focus on schools, such as Winter Weather Awareness Week. | M | Grant Writing Director | Tribe, HMA, Alaska DHS&EM, NOAA/NWS E&O, American Red Cross, APIA | Education and Awareness Programs | All | 0-2 years | B/C: Low-cost, high-benefit public safety education. TF: Potential to do this in-house or identify small grant funding. APIA may be able to support outreach activities. | Future Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **22** | Severe Weather | Support improvements to the City Commercial Dock so it is more resistant to severe weather and wave damage. | H | Grant Writing Director | HMA, U.S. DOT PIDP, USACE, EDA, Alaska DOT&PF, Denali Commission | Structure and Infrastructure Projects | City Commercial Dock | 3-4 years | B/C: Mitigation targeted to documented damage is highly cost-effective. TF: Phased funding for engineering and implementing upgrades. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Stormwater Management Plan, Land Use Plan |
| **23** | Severe Weather | Develop a survey on the impact of severe weather events on the generator, compile generator failure data associated with severe weather. | H | Grant Writing Director | HMA, DOE GRIP, Denali Commission, ALaska DHS&EM EMPG, USDA RD | Other | Generator | 0-2 years | B/C: Assessment is low-cost and informs future cost-effective projects. TF: Planning grants may be available. Window to fly out engineers is weather-dependent. | Future Plans: Comprehensive Plan, Capital Improvements Plan |
| **24** | Tsunami | Consider participation in the Tsunami Awareness Program. | M | Grant Writing Director | Tribe | Education and Awareness Programs | All | 5-10 years | B/C: Low-cost preparedness improvement. TF: Phased funding likely not required. | Future Plans: Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |
| **25** | Tsunami | Support the evaluation/repair of the current tsunami siren to ensure that it's working properly, and if needed, install a second tsunami siren. | H | Grant Writing Director | Tribe, HMA, Alaska DHS&EM, DHS/FEMA PSGP, Denali Commission | Structure and Infrastructure Projects | All | 0-2 years | B/C: High life-safety benefit compared with cost. TF: Phased funding depending on need for repairs versus new siren. | Future Plans: Comprehensive Plan, Local Emergency Operations Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **26** | Volcano | Review and update emergency notification and response procedure for volcanic ashfall and share the information effectively with residents. Protection of equipment People rely upon for subsistence (boat engines, etc.) - anything that relies on air intake should be considered, also pets. | H | Grant Writing Director | Tribe, APIA, HMA, Alaska DHS&EM EMPG, Denali Commission, USGS EHP | Plans and Regulations | All | 0-2 years | B/C: High-benefit communication improvement at low cost. TF: Phased funding for review and outreach activities. | Future Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **27** | Volcano | Support evaluation of the water treatment plant to ensure that ashfall can't enter the system. | H | Grant Writing Director | FEMA, EPA, USGS, IHS, Alaska DEC, BIA | Other | Water Treatment Plant | 3-4 years | B/C: Can prevent costly contamination, system shutdowns, and emergency water hauling by identifying needed protections before an eruption occurs. TF: Technically feasible using standard engineering review methods; can be completed with support from state, federal, and tribal environmental and utility partners. | Future Plans: Comprehensive Plan, Local Emergency Operations Plan |
| **28** | Wildland Fire | Conduct fire mitigation training with fire response team, with support from Clinic and VPSO. Conduct community fire response drills. Lead trainings for all community members on appropriate fire mitigation techniques. | H | Grant Writing Director | THSGP, USDA, BIA DHS&EM, HMA | Education and Awareness Programs | All | 0-2 years | B/C: Training improves readiness and reduces wildfire losses, which are often costly to homes and public services. TF: This project is technically feasible using local responders, clinic support, and tribal/state/federal training materials. | Future Plans: Capital Improvements Plan, Comprehensive Plan, Land Use Plan, Local Emergency Operations Plan |

#### C.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

All projects reviewed by the Planning Team were selected for inclusion in the 2027 Mitigation Action Plan.

# C.7 Plan Update

## C.7.1 Changes in Development, including in Hazard-Prone Areas (current and future)

### C.7.1.1 Changes in Development Since 2021

The Planning Team reports that there has been a home weatherization project in Akutan over the last couple of summers which creates local jobs. They also report that recent reductions in commercial fish harvests have resulted in reduced fish landing tax revenue for the City.

### C.7.1.2 Future/Planned Development

No future or planned development projects were reported by the Planning Team.

## C.7.2 Changes in Priorities and Mitigation Efforts

As this is the Native Village of Akutan's first HMP, there are no previous mitigation priorities or efforts against which to identify changes.

The priorities and mitigation efforts established in this HMP represent the jurisdiction's initial approach to hazard mitigation. Future plan updates will document changes in priorities and mitigation efforts based on changes in hazard conditions, community needs, capabilities, and implementation progress.

# C.8 Plan Maintenance

## C.8.1 Planning Team MJHMP Maintenance Commitment

The Native Village of Akutan is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.7.

The Native Village of Akutan is committed to annually reviewing the Plan and Tribal staff will work to complete their review responsibilities.

## C.8.2 Continued Public Involvement

The Native Village of Akutan is dedicated to continued public involvement over the next five years.

The Native Village of Akutan will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2032.

Future engagement should also provide opportunities for community members to identify new local observations, environmental changes, subsistence-related impacts, traditional access concerns, and other locally relevant knowledge that may affect hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where Indigenous Knowledge or other community-provided information is considered for incorporation into the MJHMP, appropriate attention should be given to Tribal review, attribution, sensitivity, and preferences regarding public disclosure.

## C.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The Native Village of Akutan jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The Grant Writing Director will be responsible for coordinating and facilitating the annual review each year.**

#### C.8.3.1.1 Implementing

Upon adoption of the Plan, the Native Village of Akutan will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The Borough will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### C.8.3.1.2 Monitoring

The Native Village of Akutan will monitor the progress of mitigation actions on an annual basis. The Grant Writing Director will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### C.8.3.1.3 Evaluating

The Native Village of Akutan will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

Annual reviews should also consider whether new Indigenous Knowledge, local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

#### C.8.3.1.4 Updating

The Native Village of Akutan will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.7. The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Figure C-32 provides a visual of the HMP plan maintenance activities per year.

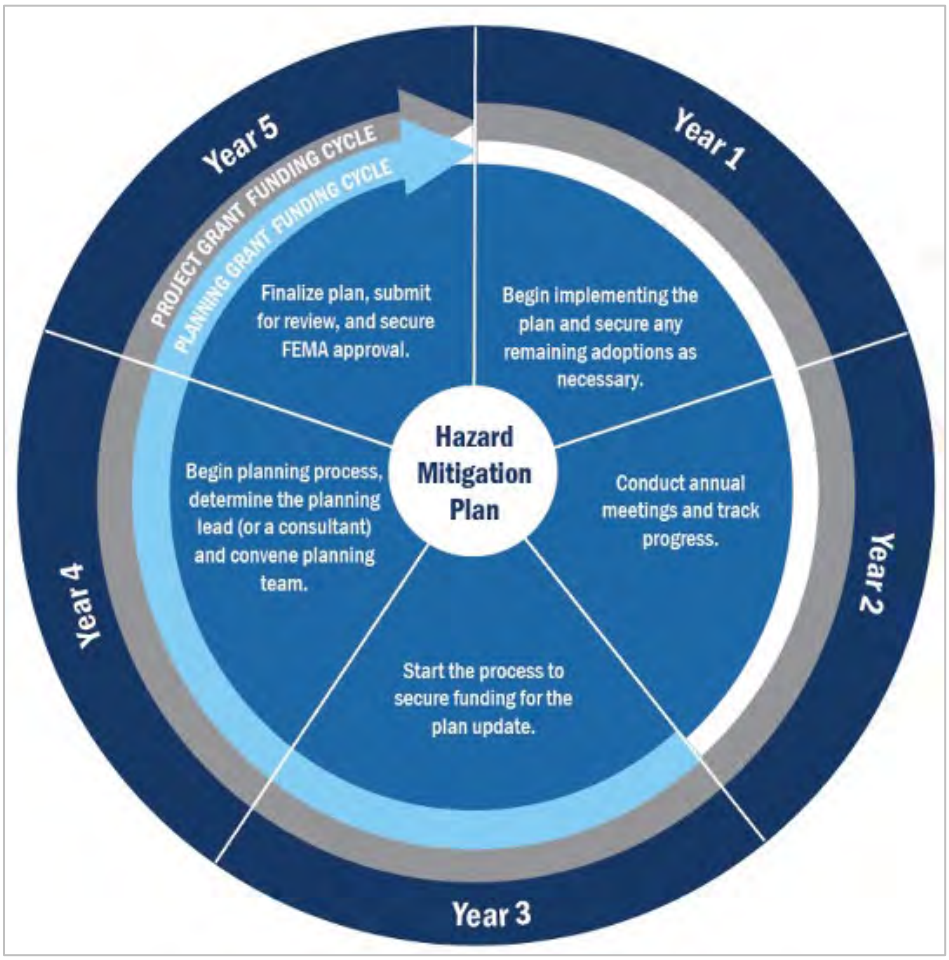



**Figure C-32- HMP Update Schedule**

## C.8.4 Plan Integration

The Native Village of Akutan will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other Tribal planning and implementation processes, when appropriate, including other FEMA programs and initiatives.

The Tribe will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the Tribe's comprehensive and land use planning processes, economic development planning, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects as well as the upcoming APIA Regional Adaptation Plan.

As the plan is implemented, the Native Village of Akutan will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## C.9 Plan Adoption

The Akutan Traditional Council formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

### C.9.1 Tribal Assurances

The Native Village of Akutan assures that the Tribal Planning Team and Tribal Council will comply with applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding (including 2 CFR Parts 200 and 3002) and will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes.

[insert signed adoption resolution]

# D. City of Cold Bay




Photo Credit: U.S. Fish and Wildlife Service

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# D.1 Planning Team

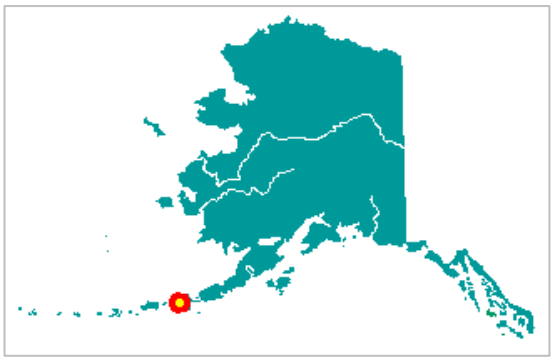
## D.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Lorie Pierce** | Administration |
| **Kurt Uttecht** | Public Works |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

# D.2 Community Profile

## D.2.1 Location and Geography

Cold Bay is located in the Izembek National Wildlife Refuge at the western end of the Alaska Peninsula at approximately 55.2056 north latitude and -162.716 west longitude. It lies 634 miles southwest of Anchorage and 180 miles northeast of Unalaska. The City has 54.4 square miles of land and 16.6 square miles of water. The community is connected to both the Gulf of Alaska and the Bering Sea by Cold Bay and Izembek Lagoon respectively.



## D.2.2 History

Archaeological sites dating to the last ice age indicate the area around Cold Bay was once inhabited by a large Native population. It was used by European hunters and trappers throughout the 19th century. Izembek Lagoon was named in 1827 by Count Feodor Kutke, after Karl Izembeck, a surgeon aboard the sloop "Moller." During World War II, Cold Bay was the site of the strategic air base Fort Randall. At that time, the airport was the largest in the state with a 10,000' runway. The city was incorporated in 1982. Cold Bay School closed in 2015 due to a lack of student enrollment.

Subsistence and recreational fishing and hunting are a part of the local culture. Up to 70,000 Canada geese migrate through Cold Bay in the fall. Izembek Lagoon offers the world's largest eelgrass beds, providing feeding grounds for more than 100,000 brant during their spring and fall migrations.

## D.2.3 Population

The 2020 Decennial Census reports a population of 50 for Cold Bay, Alaska. The DCRA reports a population of 47 as of 2025. The 2024 American Community Survey Demographic and Housing Estimates recorded a population of 145 with a margin of error of ±67.

## D.2.4 Demographics

Though the population estimates vary between sources, the 2024 ACS reports a demographic composition of 27.6% White alone, 0.7% Black or African American alone, 11.7% American Indian and Alaska Native alone, 20% Asian alone, 3.4% Native Hawaiian or Pacific Islander, 1.4% some other race alone, and 35.2% two or more races. 2.8% of the population identifies as Hispanic or Latino.

## D.2.5 Economy

Cold Bay services the fishing industry and houses federal offices focused on Aleutian transportation and wildlife protection. With a large airport for the region, federal offices, and access to the Izembek National Wildlife Refuge along with the natural beauty of the region and wild game hunting, the economy of Cold Bay supports several small lodges and inns as well as charter and guide services. The primary employers in the community are City of Cold Bay, USFW, ADOT, USAF, ADF&G, Frosty Fuels, Grant Aviation, Aleutian Airways, APUN, US Post Office, US Coast Guard, G&K Electric, EAT, FAA, Flight Service, and Weather Service.

Subsistence fishing and hunting also contribute to household food supplies and complement Cold Bay's continuing relationship with surrounding lands, waters, and wildlife resources.

## D.2.6 Land Use

As an incorporated 2nd class city, Cold Bay has the ability but not the requirement to enact and enforce planning, platting, and land use regulation. Title 7 of the Cold Bay Municipal Code is reserved for these responsibilities; however, as of 2015, the City of Cold Bay has not enacted any municipal ordinances to establish these powers within the local government.

## D.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following community-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **1999 Overall Economic Development Plan** | Provides long-term strategies for economic development and growth in the AEB and its communities | Used relevant information to develop the Community Profile |
| **2008 Cold Bay Overall Economic Development Plan** | Provides long-term strategies for economic development and growth in Cold Bay. | Used relevant information to develop the Community Profile. |
| **2010 Aleutians East Borough Hazard Mitigation Plan** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **2016 Tsunami Inundation Maps for King Cove and Cold Bay Communities, Alaska** | Identify potential tsunami hazards for the geographies and model the extent of tsunami waves generated earthquake and landslide events. | Referenced data in Tsunami hazard profile/annex. Used inundation maps as the data source for potential losses due to tsunami event. |
| **2022 City of Cold Bay Hazard Mitigation Plan** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |

Source: State of Alaska Community Plans Library, E.N. Suleimani, D.J. Nicolsky, R.D. Koehler, J.T. Freymueller, and A.E. Macpherson 2016

# D.4 Risk Assessment

## D.4.1 Hazards

The City of Cold Bay Planning Team identified the following natural hazards that may impact their geography/community.

✓ Hazard profiled for this jurisdiction in the MJHMP Update
X Hazard not profiled for this jurisdiction in the MJHMP Update

✓ Changes in the Cryosphere- Sea Ice
X Changes in the Cryosphere- Snow Avalanche
X Dam Failure
✓ Earthquake
X Flood
X Ground Failure/Landslide
✓ Invasive Species
X Sediment Deterioration and Land Destabilization
✓ Severe Weather
X Tsunami
✓ Volcano
X Wildland Fire

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere- Sea Ice | 2- Possible | 2- Limited | Cold Bay is occasionally impacted by sea ice, mainly due to the presence of sea ice in the Bay impacting vessel transportation. |
| Cryosphere- Snow Avalanche | Did not profile this hazard. | | |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485 mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>According to the 2023 State of Alaska HMP, Cold Bay is located in an area with the potential of very strong to severe shaking from earthquake events. |
| Sediment Deterioration and Land Destabilization | Did not profile this hazard. | | |
| Flood | Did not profile this hazard. | | |
| Ground Failure/ Landslide | Did not profile this hazard. | | |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of Cold Bay is susceptible to severe weather events and impacts. The Planning Team reports experiencing high winds and extreme cold events. |
| Tsunami | Did not profile this hazard. | | |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of Cold Bay is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Shishaldin.<br>According to the 2023 State of Alaska HMP, Cold Bay is located in a moderate volcanic ash hazard level area. |
| Wildland Fire | Did not profile this hazard. | | |
| Dam Failure | Did not profile this hazard. | | |
| Invasive Species | 3- Likely | 2- Limited | The entire natural area surrounding Cold Bay is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. Cold Bay's role as a transportation hub is the primary human-caused pathway in the spread of invasive species in the region. |




**Figure D-1- City of Cold Bay Planning Area**

### D.4.1.1 Changes in the Cryosphere- Sea Ice

#### D.4.1.1.1 Location

Cold Bay is occasionally impacted by sea ice, mainly due to the presence of sea ice in the Bay impacting vessel transportation.

#### D.4.1.1.2 History

In 2026, Bering Sea ice extended to Cold Bay.

The Planning Team reported that Cold Bay experienced sea ice in the winter of 2026 for the first time since 2012, impacting the Bay and Izembek Lagoon. The Bay was frozen for two weeks and forced a freight boat to reschedule. This prolonged period of sea ice resulted in significant loss of birds and several sea otters that were presumably unable to reach their feeding ground. Dead birds were also found throughout town. The Planning Team also reported some associated beach sediment deterioration.

The image below was taken in February 2026 and submitted by a community member, who stated that “ice miles off the dock which is unheard of. This ended up resulting in serious damage to the south end of our dock when the ice broke. This damage caused our dock to be closed which is the main way we receive fuel and groceries and many supplies…”.

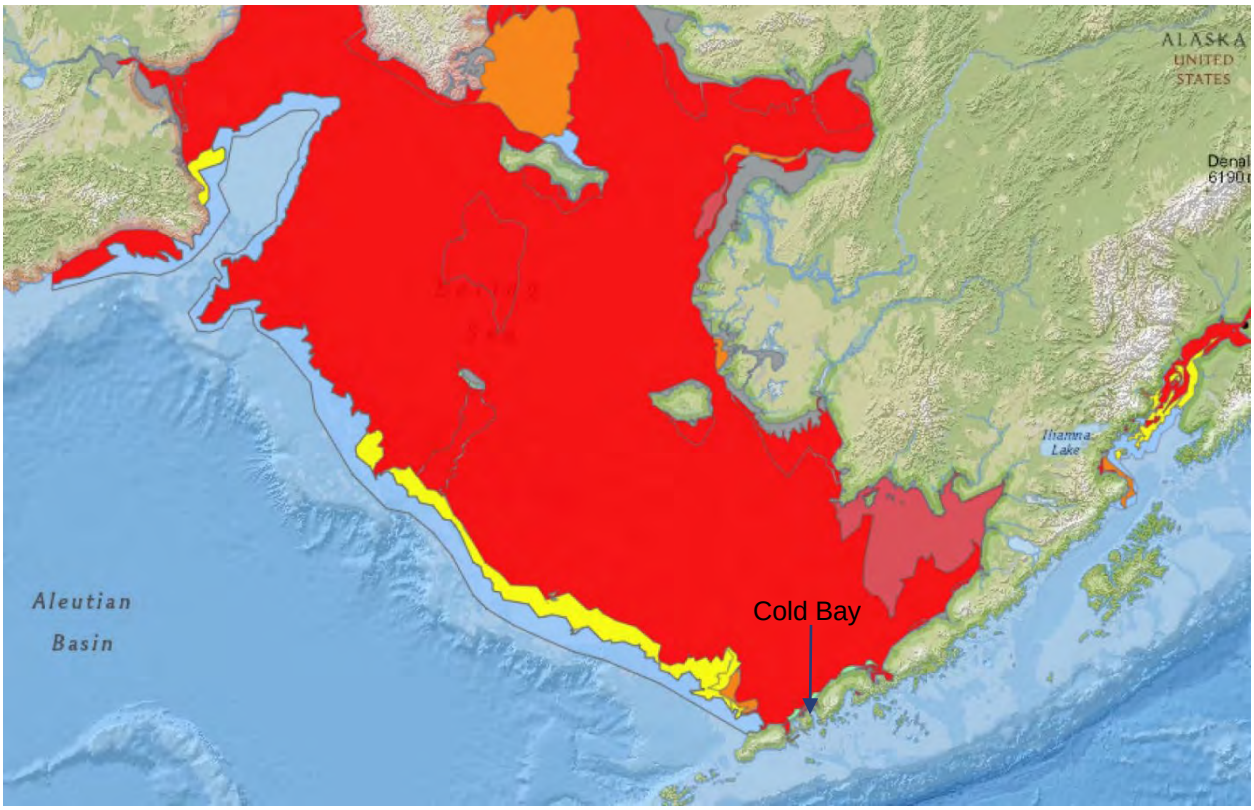


Source: Tara Ferguson Gould

**Figure D-2- Sea Ice Off the Cold Bay Dock, February 2026**

#### D.4.1.1.3 Extent (Magnitude and Severity)

Figure  shows the extent of sea ice in the Bering Sea on March 31st, 2026, with Cold Bay labeled. It shows sea ice on the northern coastline, including Izembek Lagoon. The areas in red are where 90 to 100% of the water surface is covered by ice. Areas in yellow are 40 to 60% covered in ice.




Source: NWS Alaska Sea Ice Program 2026

**Figure D-3- Sea Ice Extent in the Bering Sea on March 31st, 2026**

It was reported by the City of Cold Bay Planning Team that the sea ice surrounding the Bay was several inches thick.

Based on the extent of past sea ice events and the criteria identified in Table 5 of the Base Plan, the extent of changes in sea ice in Cold Bay are considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### D.4.1.1.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The Planning Team reported that changes in sea ice have resulted in some sediment deterioration on the beach. |
| Infrastructure | A community member reported that there was ice miles off the Cold Bay dock in the winter of 2026, resulting in serious damage to the south end of the dock when the ice broke. |
| People | During the winter of 2026, it was reported that the presence of sea ice closed the dock, disrupting the arrival of fuel, groceries, and other supplies for about two weeks. |

| Description of Previous Impacts | |
|---|---|
| Utilities | The Planning Team did not report any specific damages to utilities due to sea ice changes. |
| Transportation | The Planning Team reported that in the winter of 2026, the City Dock had to close due to sea ice, resulting in the delay of a freight boat. |
| Economy | The Planning Team does not report specific previous local economic impacts due to changes in sea ice in Cold Bay, however the freight boat that was delayed due to sea ice in the winter of 2026 had to reschedule. |
| Subsistence Resources | The Planning Team does not report specific previous impacts to subsistence resources due to changes in sea ice in Cold Bay. |

#### D.4.1.1.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Cold Bay will experience a sea ice event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### D.4.1.1.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of sea ice hazards in Alaska. |
| Location | Future climate conditions are likely to influence the location of sea ice changes and associated hazards in Alaska by shifting the typical location of sea-ice loss northward and earlier in the season, resulting in longer periods of open water across the Bering Sea and reducing the likelihood that protective ice will form or persist near Cold Bay. |
| Extent | Future climate conditions are likely to influence the extent of sea ice. The winter Bering Sea Ice cover continues to retreat as a long-term trend with year-to-year variability (State of Alaska DHS&EM 2023). |
| Impact | During the last several decades, Alaska has warmed twice as fast as the rest of the U.S. Sea ice and climate are intimately linked. An ice bench reduces wave development in the open ocean during winter months. Without an ice bench, waves can mechanically erode coastal beaches. Many villages are located along Alaska's coastline and are threatened by eroding shores.<br><br>Retreat of sea ice is anticipated to disrupt marine ecosystem, impact local communities where sea ice is important for subsistence or tourism, and contribute to increased storm surge, coastal flooding, and sediment deterioration and land destabilization (City of Cold Bay LHMP 2022). The presence of sea ice, which may continue to be highly variable from year to year despite a long-term downward trend, may cause delays to freight and damages to marine and coastal infrastructure. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of sea ice cover-related events, especially severe storms, in Cold Bay. Due to the loss of winter sea ice and other factors including increased temperatures and precipitation, Alaska as a whole is projected to see a threefold increase in severe storms (State of Alaska DHS&EM, 2023). |

| Description of Future Conditions | |
|---|---|
| Population Patterns | Future climate conditions may influence population patterns as they relate to sea ice hazards, as increased frequency and adverse impacts from severe storms could lead people to relocate from vulnerable coastal areas, or from the community entirely. |
| Land Use Development | Future climate conditions may influence land use development as it relates to sea ice hazards, as an increase in severe storms without sea ice protection could lead to changes in the location of certain land use development activities - such as areas slated for marine infrastructure, residential construction or waste management - that are vulnerable to these severe storms. |
| Subsistence Resources | Future climate conditions are expected to influence subsistence resources as they relate to sea ice hazards. Low winter sea ice extents, which have been seen in the Bering Sea in the last decade, affect the marine ecosystem that supports subsistence resources that are critical to AEB communities' ways of life. Some species are expected to shift northward, such as Pacific Cod. Migration patterns and timing for species including salmon, marine mammals, and subsistence waterfowl are also observed and expected in the future. |

### D.4.1.2 Changes in the Cryosphere- Snow Avalanche

The City of Cold Bay Planning Team did not select this hazard for the MJHMP.

### D.4.1.3 Dam Failure

The City of Cold Bay Planning Team did not select this hazard for the MJHMP update.

There are no dams located in Cold Bay.

### D.4.1.4 Earthquake

#### D.4.1.4.1 Location

The entire geography of Cold Bay is vulnerable to earthquakes, due to its location on the Alaska-Aleutian subduction zone.

According to the 2023 State of Alaska HMP, Cold Bay is located in an area with the potential of very strong (18 -34) to severe (PGA 34-65) perceived shaking from earthquakes. Perceived shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. This map focuses on the actual variations in shaking intensity across a region as felt by people and structures.

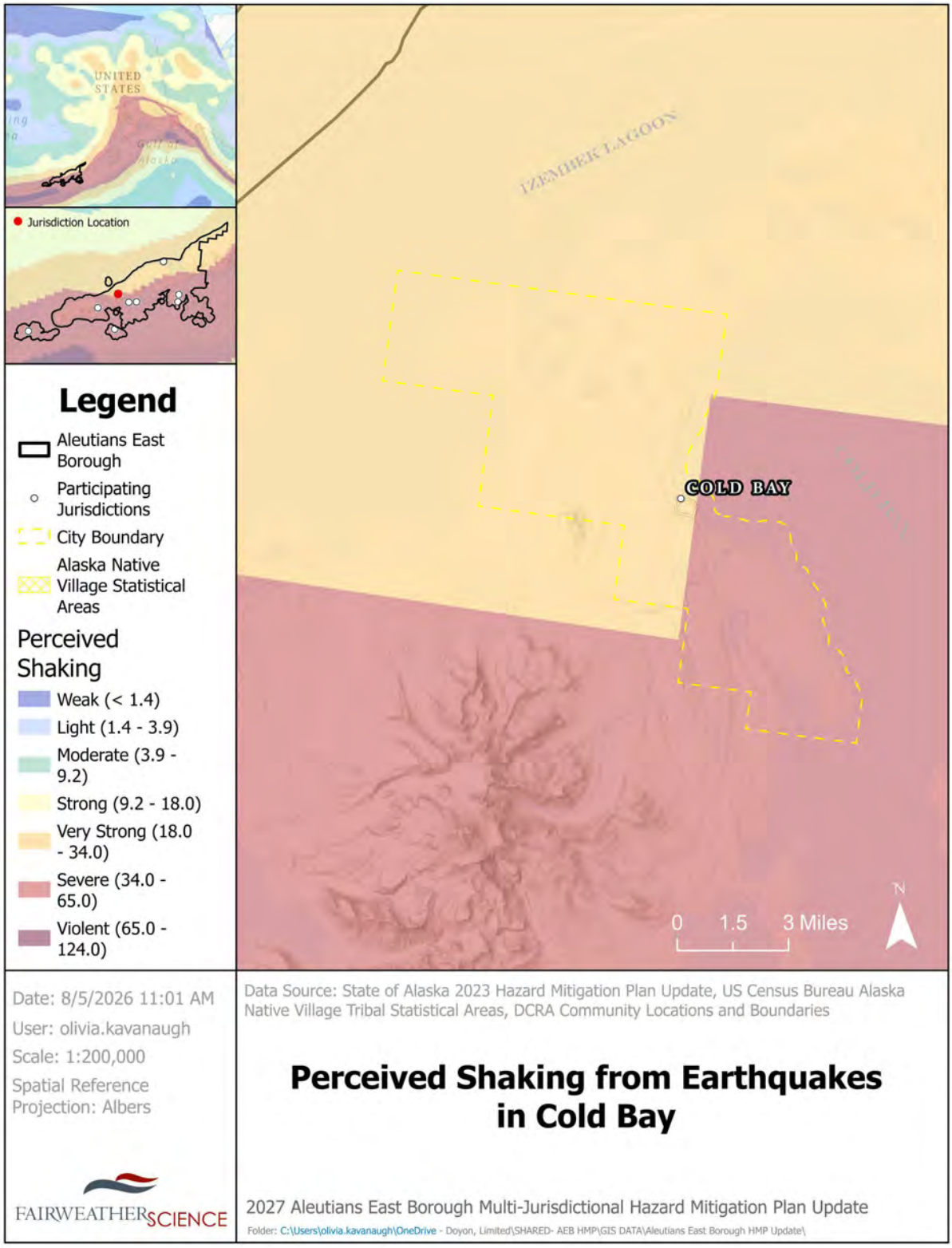



**Figure D-4 - Perceived Shaking from Earthquakes in Cold Bay**

#### D.4.1.4.2 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including Cold Bay can be found in Table 11 of the Base Plan.

#### D.4.1.4.3 Extent (Magnitude and Severity)

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding Cold Bay experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Based on the extent of past earthquakes and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in Cold Bay is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### D.4.1.4.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | There have been no recorded earthquake impacts on the geography or land in Cold Bay. An earthquake has the potential to trigger landslides, open cracks in the earth, and change the shoreline. |
| Infrastructure | The 2018 Anchorage Earthquake caused damage to the city dock concrete panel resulting in a substantial crack. As of 2026, the City of Cold Bay is dealing with an issue with the same panel as the crack has now grown. |
| People | No injuries or fatalities due to earthquakes have been reported in Cold Bay. Injuries or fatalities are possible due to falling debris. |
| Utilities | There are no recorded impacts on utility systems due to earthquakes in Cold Bay. Earthquakes can damage sewer and water lines, and down telephone poles. |
| Transportation | The 2018 Anchorage Earthquake caused damage to a DOT road leading out of town, which required repairs. In the future, earthquakes could damage roadways or airport runways, limit road and air travel, or cause a tsunami that could damage boat harbors and other water travel infrastructure. |
| Economy | There is no recorded economic impacts due to earthquakes in Cold Bay. |
| Subsistence Resources | There is no recorded earthquake caused impacts on subsistence resources in Cold Bay. |

#### D.4.1.4.5 Probability of Future Events

Cold Bay is located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing Cold Bay.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Cold Bay will experience an earthquake of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### D.4.1.4.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | The characteristics and nature of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Location | The location of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Extent | The extent of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Impact | The impact of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Probability of Future Events | The probability of future earthquake events is not affected by changing climate conditions and is not expected to change on human timescales (Alaska DHS&EM 2023). |
| Population Patterns | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, population patterns in Cold Bay are not expected to be affected. |
| Land Use Development | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, land use development in Cold Bay is not expected to be affected. |
| Subsistence Resources | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, subsistence resources in Cold Bay are not expected to be affected. |

### D.4.1.5 Flood

The City of Cold Bay Planning Team did not select this hazard for the MJHMP.

Cold Bay is located approximately 100 feet above sea level on a steep bluff, which does not allow for storm surge or other forms of coastal flooding.

### D.4.1.6 Ground Failure/Landslide

The City of Cold Bay Planning Team did not select this hazard during the MJHMP update.

Figure  depicts the location and type of historical landslide events near Cold Bay. There is no information associated with this event, but the landslide did not impact the community or any critical facilities.

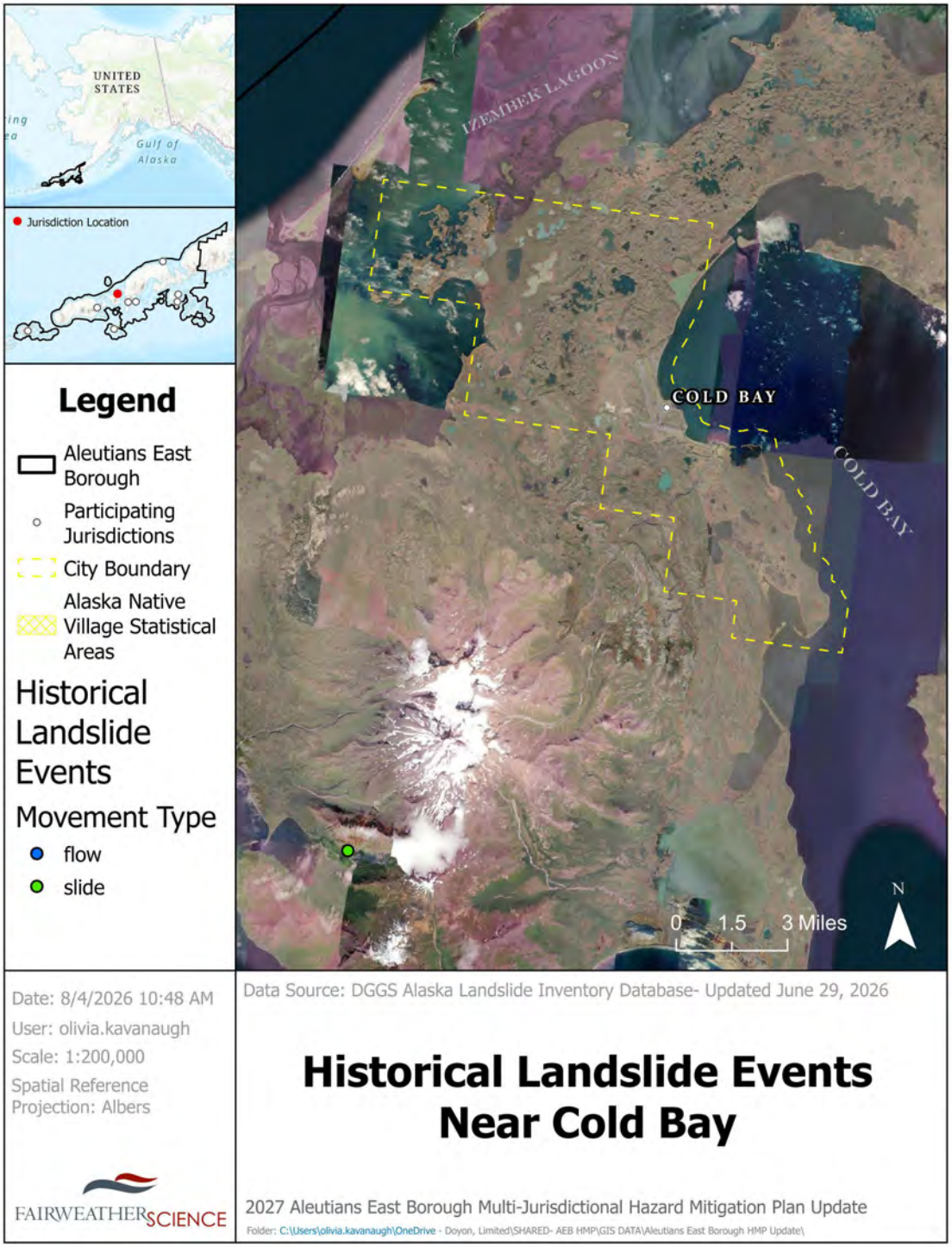



**Figure D-5- Historical Landslide Events Near Cold Bay**

### D.4.1.7 Invasive Species

#### D.4.1.7.1 Location

The entire natural area surrounding Cold Bay is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. Cold Bay's role as a transportation hub is the primary human-caused pathway in the spread of invasive species in the region.

In Cold Bay, several species of invasive terrestrial plants and animals have been documented, including:

- Canada Thistle
- Orange Hawkweed
- Oxeye Daisy
- Creeping Buttercup
- Common Dandelion
- Tall Buttercup
- Common Sheep Sorrel
- Smooth Brome
- European Mountain Ash
- White Clover
- Meadow Hawkweed
- Common Chickweed
- European Black Slug

Figure D-6 depicts the locations of documented invasive terrestrial plant species in Cold Bay, as reported by community members in the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database.

Note that the "downtown" area may have more documented invasive species sightings than other areas of the community due to its higher population density and greater likelihood of observation and reporting. Therefore, the number of reported sightings may not necessarily reflect the actual distribution or abundance of invasive species across the community.

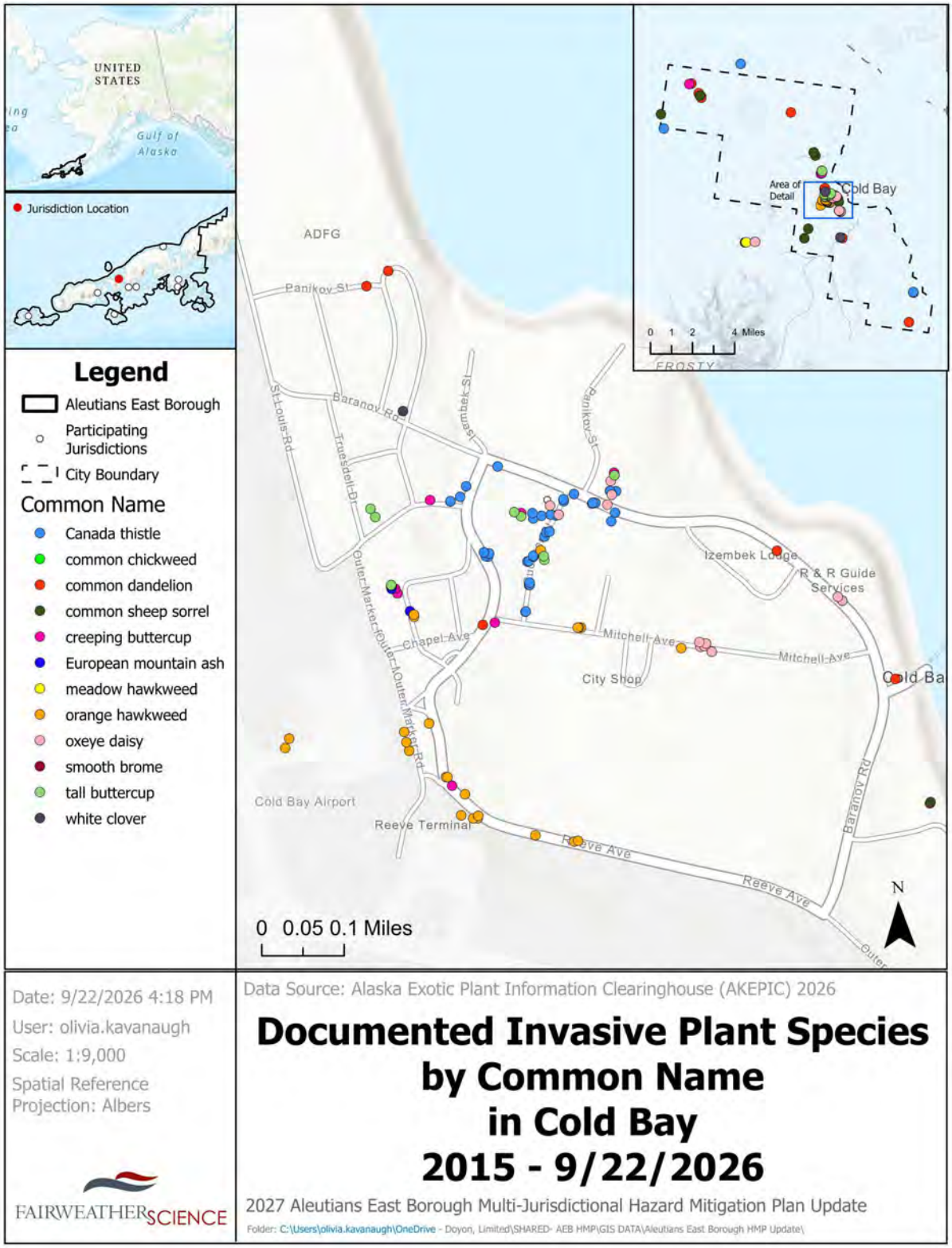



**Figure D-6- Documented Invasive Plant Species by Common Name in Cold Bay**

#### D.4.1.7.2 History

Cold Bay has had historical vessel traffic related to the fishing and shipping industry, which has contributed to the spread of invasive species in the region. While there have been no historical occurrences of invasive rats or invasive aquatic animals in the community, Cold Bay has had a history with the spread of invasive terrestrial plants and slugs. While there are documented occurrences of invasive plants in Cold Bay, the exact timeline of arrival is difficult to confirm.

The image below was submitted by a community member and was described as the first European black slug adult found in Cold Bay in July 2026.



Source: Bryce Usiak via the project survey

**Figure D-7- Invasive European Black Slug Adult Found in Cold Bay, July 2026**

#### D.4.1.7.3 Extent (Magnitude and Severity)

Although damages to the lands surrounding Cold Bay from invasive species has been limited, there are several non-native plants with a high invasiveness that have occurred near the community.

Table D-1 displays the non-native plant occurrences that have occurred within the City of Cold Bay.

**Table D-1 – Non-Native Plants in the City of Cold Bay**

| Invasive Plant Species | Invasiveness Ranking (0-100) | Total Infested Area |
|---|---|---|
| **Canada Thistle** | 76 | 37.734 |
| **Orange Hawkweed** | 79 | 8.125 |
| **Oxeye Daisy** | 61 | 3.716 |
| **Creeping Buttercup** | 72 | 0.571 |
| **Common Dandelion** | 58 | 0.134 |
| **Tall Buttercup** | 60 | 0.127 |
| **Common Sheep Sorrel** | 51 | 0.113 |
| **Smooth Brome** | 62 | 0.100 |
| **European Mountain Ash** | 59 | 0.051 |
| **White Clover** | 59 | 0.011 |
| **Meadow Hawkweed** | 79 | 0.003 |
| **Common Chickweed** | 42 | 0.001 |

Source: AKEPIC 2026

Invasive aquatic and terrestrial animals like Norway Rats and the European Green Crab have not been documented in Cold Bay.

**While invasive species are a concern for many communities, at this time, the presence of these species is not impacting critical facilities.**

Based on previous occurrences and the criteria identified in Table 5 of the Base Plan, the magnitude and severity to Cold Bay from invasive species are considered **Limited**.

#### D.4.1.7.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of invasive species on the land surrounding Cold Bay has been localized non-native plant infestations, which can outcompete native plants and wildlife. |
| Infrastructure | There is limited evidence that invasive species have directly impacted infrastructure in Cold Bay. |
| People | While invasive species can affect resources that people depend on, Cold Bay has no history of invasive species directly affecting the residents of the community. |
| Utilities | There have been no documented cases of invasive species causing utility disruptions in Cold Bay. |
| Transportation | Transportation is identified as a major pathway for invasive species to spread throughout Cold Bay. Due to the nature of invasive species in the community, there is little evidence to show that these species cause direct damage to transportation infrastructure in Cold Bay. |
| Economy | There have been no reports of an invasive species infestation resulting in significant economic impacts in Cold Bay. |
| Subsistence Resources | Invasive species pose a potential threat to subsistence resources in Cold Bay. Species like the European Black Slug are known to feed on plants and berries, a key aspect to subsistence culture for the community.<br>Community members state that the first European Black Slug was reported in Cold Bay in July 2026. At this time, impacts to subsistence resources due to the presence of the European Black Slug have not been reported in Cold Bay. Community members should continue to monitor the presence of slugs in the community and document impacts to subsistence resources including plants and berries. Documented impacts to subsistence resources should be included in the next version of this MJHMP Update. |

#### D.4.1.7.5 Probability of Future Events

Based on previous occurrences, and the criteria identified in Table 5 of the Base Plan, it is **Likely** that Cold Bay will experience an invasive species event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### D.4.1.7.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is possible future climate conditions will influence the nature of invasive species in Cold Bay. Warmer temperatures and longer growing seasons may allow some invasive species to become established in areas where they don't historically occur. |
| Location | It is likely future climate conditions will influence the location of invasive species in Cold Bay. Changes in temperature and precipitation patterns may allow invasive species to expand into new terrestrial and marine areas of Cold Bay. |
| Extent (Magnitude /Severity) | It is likely future climate conditions will influence the magnitude and severity of invasive species in Cold Bay. Future changes may create favorable conditions for certain invasive species, allowing populations to spread at a rapid rate. |
| Impact | It is likely future climate conditions will influence the impacts of invasive species in Cold Bay. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of invasive species in Cold Bay. As environmental conditions change, areas that were previously unsuitable for certain invasive species may become more favorable for establishment and spread, which increases the probability of future events in Cold Bay. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Cold Bay. Changes in the distribution and abundance of invasive species may alter the availability of food and habitat relied upon by wildlife and residents of Cold Bay. |
| Land Use Development | It is unlikely future climate conditions will influence future land use development in Cold Bay. |
| Subsistence Resources | It is likely future climate conditions will influence subsistence resources in Cold Bay. Changes in ocean conditions, weather patterns, and species distribution may affect the availability and accessibility of important subsistence resources. The introduction or expansion of invasive species could further impact native species that support subsistence activities in Cold Bay. |

### D.4.1.8 Sediment Deterioration and Land Destabilization

The City of Cold Bay Planning Team did not select this hazard to be profiled in the MJHMP Update.

Cold Bay is located approximately 100 feet above sea level on a steep bluff and critical facilities are not threatened by sediment deterioration and land destabilization.

### D.4.1.9 Severe Weather

The City of Cold Bay Planning Team reported experiencing high wind, heavy/drifting snow, and extreme cold events.

#### D.4.1.9.1 Location

The entirety of Cold Bay is vulnerable to severe weather events.

#### D.4.1.9.2 History

The following historic severe weather events are included in the NOAA NCEI Storm Events Database.

**Table D-2- Historical Severe Weather Events in the AEB Planning Area (1996 - March 2026)**

| Date | Event Type | Event Description |
|---|---|---|
| 1996-10-28 | High Wind | Cold Bay reported gusts in excess of 53 mph. |
| 1996-10-31 | High Wind | Wind gusts reached 54 mph at Cold Bay. |
| 1996-09-25 | High Wind | Wind gusts reached 45 mph at Cold Bay. |
| 1996-09-11 | High Wind | Wind gusts reached 45 mph at the Cold Bay Airport. |
| 1998-04-09 | High Wind | Prefrontal winds reached 75 mph at Cold Bay. |
| 2025-01-23 | High Wind | Wind gusts reached 60 mph in Cold Bay. |

Source: NOAA NCEI 2026- Storm Events Database

The City of Cold Bay Planning Team reported experiencing high winds on a regular basis. They reported snowdrifts during most winters for weeks at a time. The Planning Team reported that the winter of 2026 was extremely cold – in the single digits – for long periods of time.

#### D.4.1.9.3 Extent (Magnitude and Severity)

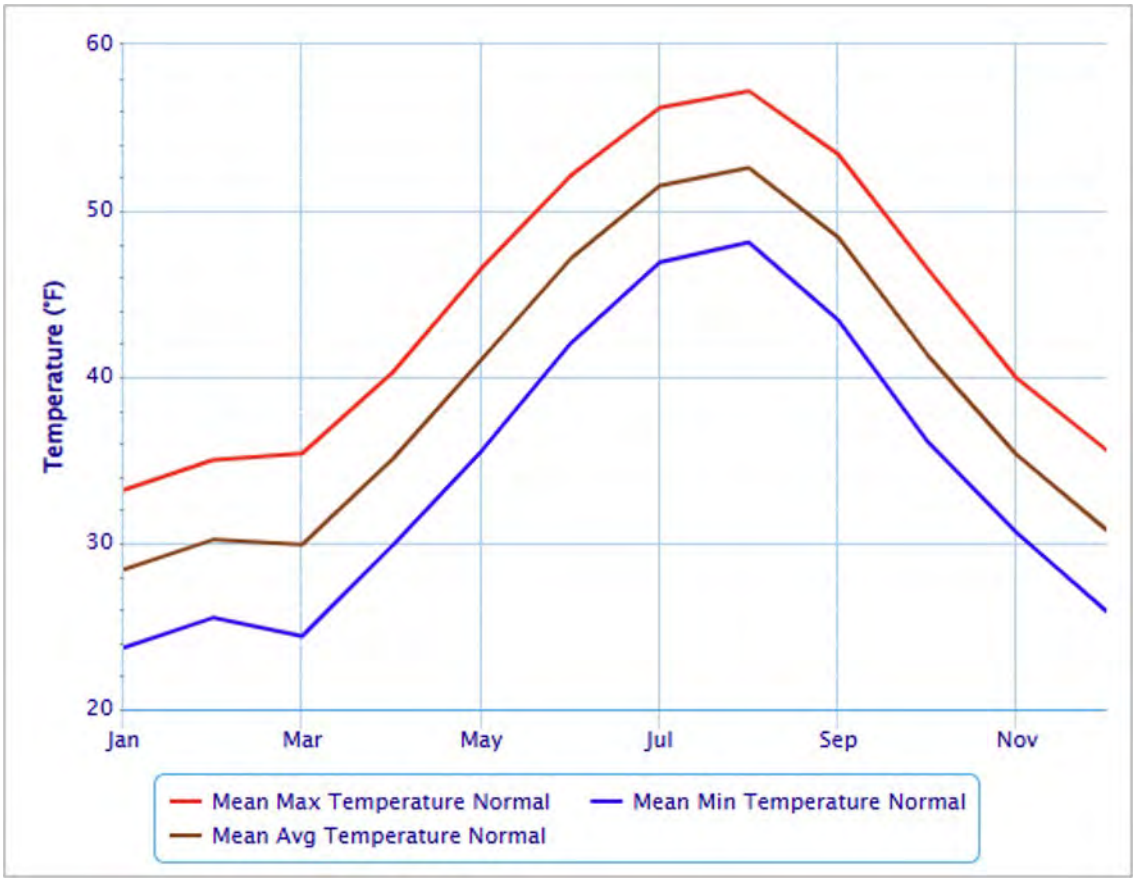
Extreme Cold: The table and figure below shows monthly climate normals from 1991 to 2020 at the Cold Bay Airport. The average temperature during this timeframe in January was 28.4 °F, while the average August temperature was 52.6 °F.

**Table D-3- Monthly Climate Normals (1991-2020) - COLD BAY AIRPORT, AK**

| Month | Mean Mx Temperature Normal (degrees F) | Mean Min Temperature Normal (degrees F) | Mean Avg Temperature Normal (degrees F) |
|---|---|---|---|
| **January** | 33.2 | 23.7 | 28.4 |
| **February** | 35.0 | 25.5 | 30.2 |
| **March** | 35.4 | 24.4 | 29.9 |
| **April** | 40.2 | 29.8 | 35.0 |
| **May** | 46.5 | 35.5 | 41.0 |
| **June** | 52.1 | 42.0 | 47.1 |
| **July** | 56.2 | 46.9 | 51.5 |
| **August** | 57.2 | 48.1 | 52.6 |
| **September** | 53.4 | 43.4 | 48.4 |
| **October** | 46.5 | 36.1 | 41.3 |

| Month | Mean Mx Temperature Normal (degrees F) | Mean Min Temperature Normal (degrees F) | Mean Avg Temperature Normal (degrees F) |
|---|---|---|---|
| **November** | 39.9 | 30.6 | 35.3 |
| **December** | 35.6 | 25.9 | 30.8 |
| **Annual** | 44.3 | 34.3 | 39.3 |

Source: NWS NOWData 2026




Source: NWS NOWData 2026

**Figure D-8- Monthly Climate Normals (1991-2020) - COLD BAY AIRPORT, AK**

According to the City of Cold Bay Planning Team, the temperatures during the 2025-2026 winter season were down in the single digits for approximately 3 weeks.

Heavy Rain: The National Weather Service has a weather station at Cold Bay Airport. Precipitation occurs all months of year, with the wettest time between August and January, as shown in Table D-4 and Table D-5. Storms can bring heavy rainfall at any time of year.

**Table D-4- Monthly Total Precipitation for COLD BAY AIRPORT, AK 1990-2020 (inches)**

| Data | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mean** | 3.02 | 2.71 | 2.46 | 2.23 | 2.50 | 2.38 | 2.45 | **3.67** | **4.33** | **4.60** | **4.55** | **3.80** | 39.18 |
| **Max** | 6.25<br>2002 | 7.54<br>2000 | 7.13<br>2012 | 6.55<br>1979 | 6.84<br>2002 | 8.35<br>2000 | 6.13<br>1982 | 9.97<br>1951 | 9.79<br>1965 | 10.17<br>2000 | 12.22<br>2000 | 13.94<br>2000 | 84.32<br>2000 |
| **Min** | 0.60<br>1998 | 0.43<br>1963 | 0.04<br>2017 | 0.21<br>1964 | 0.27<br>2014 | 0.12<br>1961 | 0.28<br>1950 | 1.10<br>1975 | 1.91<br>1952 | 1.43<br>1997 | 1.15<br>1975 | 0.19<br>1956 | 23.41<br>1961 |

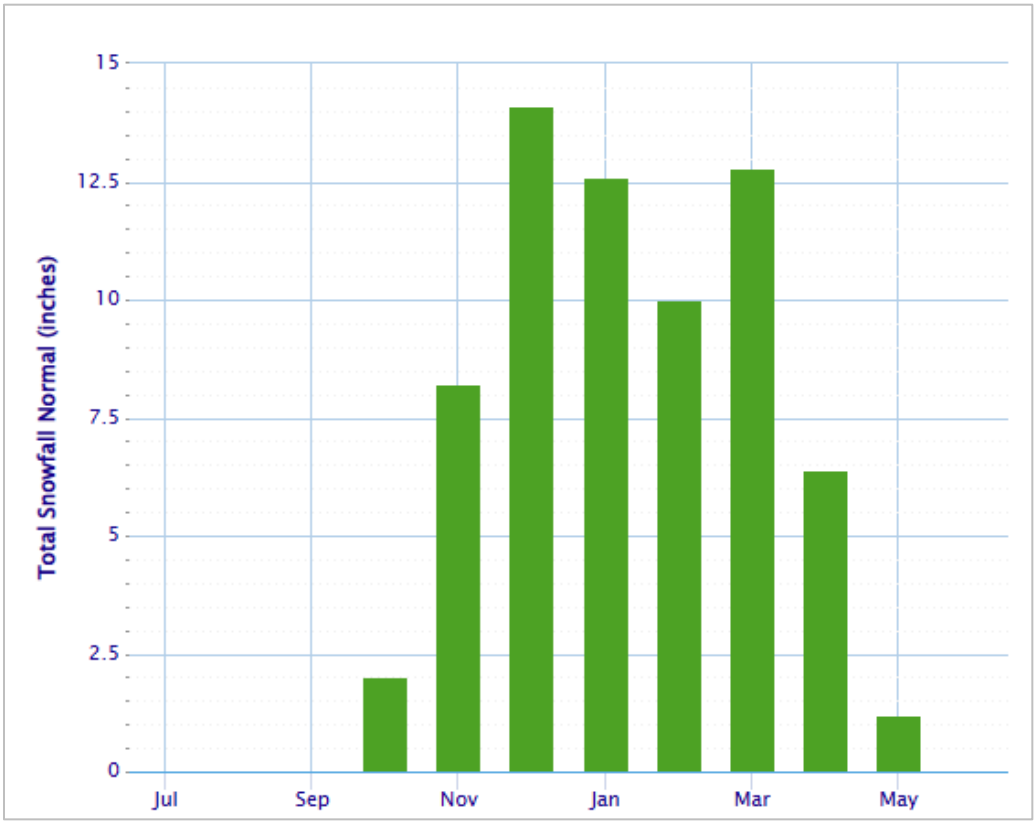
Source: NWS NOWData 2026

**Table D-5- Monthly Total Precipitation for COLD BAY AIRPORT, AK 2021-2026 (inches)**

| Data | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mean** | **4.08** | 3.52 | 2.83 | 3.11 | 2.82 | 2.32 | 3.48 | **4.02** | **4.55** | **4.93** | **4.31** | **3.74** | 43.64 |
| **Max** | 7.07<br>2025 | 4.56<br>2022 | 4.22<br>2023 | 4.00<br>2026 | 4.16<br>2023 | 4.35<br>2025 | 5.59<br>2023 | 6.45<br>2022 | 5.47<br>2023 | 5.96<br>2021 | 5.02<br>2022 | 6.86<br>2024 | 46.70<br>2024 |
| **Min** | 1.00<br>2026 | 3.04<br>2023 | 1.02<br>2025 | 1.86<br>2023 | 2022<br>0.84 | 0.74<br>2026 | 1.76<br>2021 | 2.73<br>2023 | 2.82<br>2024 | 2.25<br>2023 | 3.66<br>2023 | 2.62<br>2025 | 39.96<br>2023 |

Source: NWS NOWData 2026

Heavy Snow: The figure below shows monthly climate normals from 1991 to 2020 at the Cold Bay Airport. It shows total monthly snowfall averages from 1991 to 2020, which have been highest historically in December, with an average of 14.1 inches. Note that snowfall varies significantly with geography and elevation. Cold Bay Airport is located approximately 99.5 feet above sea level.




Source: UAF ACRC 2026

**Figure D-9- Monthly Climate Normals (1991-2020) - COLD BAY AIRPORT, AK**

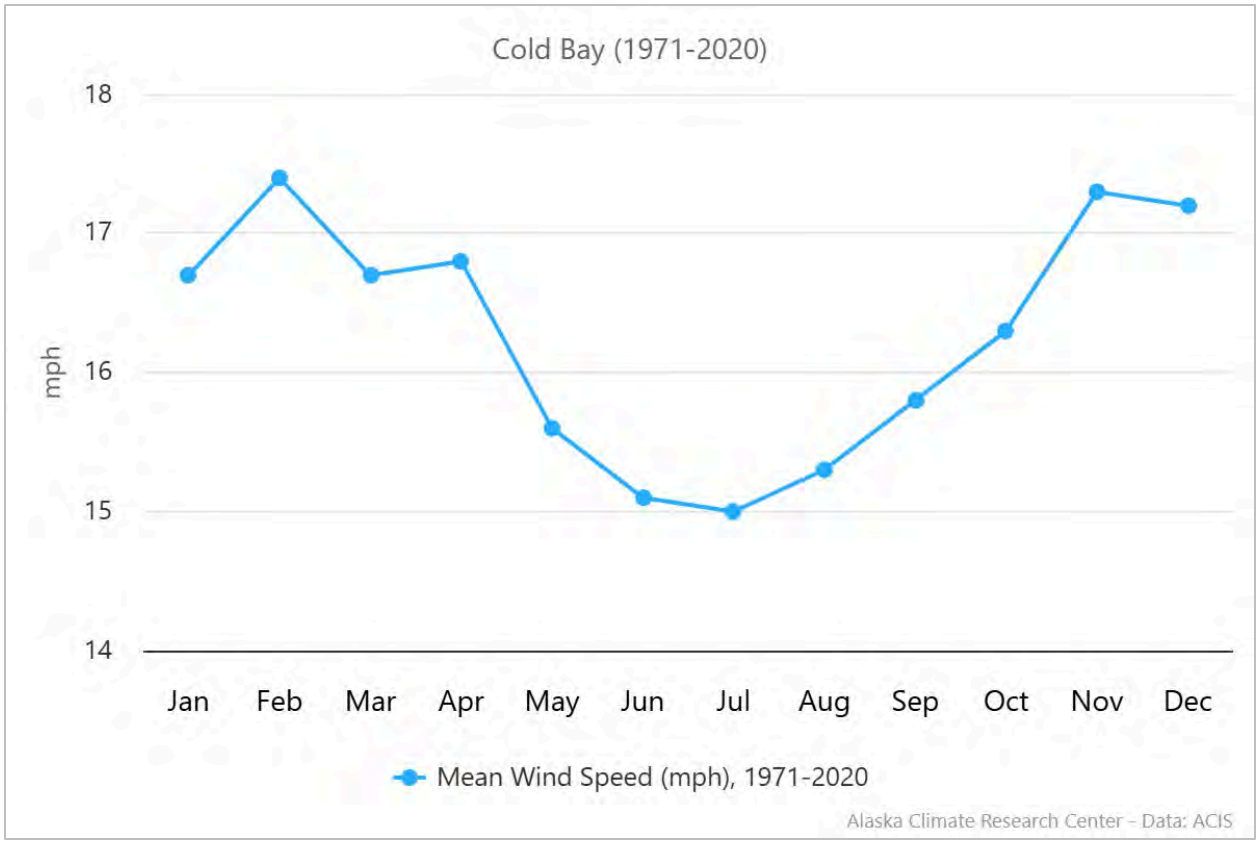
According to the City of Cold Bay Planning Team, snow drifts during the 2025-2026 winter season were reported up to 6 feet deep and 10-15 feet long.

High Wind: There is a First Order Automated Surface Observing System (ASOS) at the Cold Bay airport (ID USW00025624). This station has been collecting data since 1971 and shows the highest monthly average wind speeds were recorded during the winter months, per Table D-6 and Figure .

**Table D-6- Cold Bay Mean Wind Speeds, 1971-2020**

| Month | Mean Wind Speed (mph) |
|---|---|
| **January** | 16.7 |
| **February** | 17.4 |
| **March** | 16.7 |
| **April** | 16.8 |
| **May** | 15.6 |
| **June** | 15.1 |
| **July** | 15 |
| **August** | 15.3 |
| **September** | 15.8 |
| **October** | 16.3 |
| **November** | 17.3 |
| **December** | 17.2 |
| **Annual** | 16.3 |

Source: UAF ACRC 2026




Source: UAF ACRC 2026

**Figure D-10- Cold Bay Mean Wind Speeds, 1971-2020**

Table D-7 compiles monthly peak wind speeds and maximum sustained wind speeds at the Cold Bay Airport. This data, from NOAA's National Centers for Environmental Information (NCEI), is currently available through August 2025. During this time, the maximum peak wind speed recorded was 88mph in December 2022 and January 2024. The maximum sustained wind speed recorded was 67mph in December 2022. NCEI defines maximum sustained wind as the fastest reported wind speed for the day that is sustained for at least 2 minutes (NOAA NCEI 2026). For comparison, a Category 1 hurricane has sustained wind speeds of 74 to 95mph.

**Table D-7- Monthly Maximum Wind Speeds - Peak and Sustained - Cold Bay Airport, January 2021-August 2025**

| Year and Month | Peak Wind Speed (miles per hour, mph) | Maximum Sustained Wind |
|---|---|---|
| **2021-01** | 66 | 55 |
| **2021-02** | 74 | 58 |
| **2021-03** | 70 | 55 |
| **2021-04** | 57 | 46 |
| **2021-05** | 59 | 47 |
| **2021-06** | 68 | 53 |
| **2021-07** | 49 | 41 |
| **2021-08** | 48 | 39 |

| Year and Month | Peak Wind Speed (miles per hour, mph) | Maximum Sustained Wind |
|---|---|---|
| **2021-09** | 66 | 54 |
| **2021-10** | 66 | 55 |
| **2021-11** | 65 | 51 |
| **2021-12** | 68 | 55 |
| **2022-01** | 53 | 40 |
| **2022-02** | 64 | 51 |
| **2022-03** | 67 | 49 |
| **2022-04** | 66 | 47 |
| **2022-05** | 47 | 30 |
| **2022-06** | 61 | 49 |
| **2022-07** | 53 | 40 |
| **2022-08** | 52 | 36 |
| **2022-09** | 46 | 37 |
| **2022-10** | 68 | 53 |
| **2022-11** | 69 | 58 |
| **2022-12** | **88** | **67** |
| **2023-01** | 49 | 39 |
| **2023-02** | 68 | 58 |
| **2023-03** | 68 | 55 |
| **2023-04** | 48 | 41 |
| **2023-05** | 54 | 45 |
| **2023-06** | 47 | 40 |
| **2023-07** | 58 | 46 |
| **2023-08** | 65 | 48 |
| **2023-09** | 54 | 38 |
| **2023-10** | 56 | 45 |
| **2023-11** | 63 | 47 |
| **2023-12** | 64 | 52 |
| **2024-01** | **88** | **63** |
| **2024-02** | 76 | 56 |
| **2024-03** | 80 | 62 |
| **2024-04** | 62 | 45 |
| **2024-05** | 54 | 44 |
| **2024-06** | 65 | 51 |

| Year and Month | Peak Wind Speed (miles per hour, mph) | Maximum Sustained Wind |
|---|---|---|
| **2024-07** | 65 | 46 |
| **2024-08** | 64 | 48 |
| **2024-09** | 80 | 58 |
| **2024-10** | 69 | 52 |
| **2024-11** | 83 | 59 |
| **2024-12** | 77 | 56 |
| **2025-01** | 67 | 53 |
| **2025-02** | 69 | 51 |
| **2025-03** | 66 | 51 |
| **2025-04** | 58 | 45 |
| **2025-05** | 65 | 49 |
| **2025-06** | 69 | 52 |
| **2025-07** | 46 | 35 |
| **2025-08** | 50 | 37 |

Source: NOAA NCEI 2026

According to the City of Cold Bay Planning Team, wind speeds as high as 90 mph were reported in the summer of 2026.

Based on the history of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of extreme weather in Cold Bay is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### D.4.1.9.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | The City of Cold Bay Planning Team did not report specific previous impacts related to severe weather to the geography/land in Cold Bay. |
| Infrastructure | The City of Cold Bay Planning Team reported that high winds can be damaging to structures. |
| People | The City of Cold Bay Planning Team did not report specific previous impacts on people related to severe weather in Cold Bay. |
| Utilities | The City of Cold Bay Planning Team reported that extreme cold in the winter of 2026 caused water lines to break and pipes to freeze. |
| Transportation | The City of Cold Bay Planning Team did not report specific previous transportation impacts related to severe weather in Cold Bay. |
| Economy | The City of Cold Bay Planning Team did not report specific previous economic impacts related to severe weather in Cold Bay. |
| Subsistence Resources | The City of Cold Bay Planning Team did not report specific previous subsistence impacts related to severe weather in Cold Bay. |

#### D.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Cold Bay will experience a will experience a severe weather event (dense fog, extreme cold, heavy rain, heavy snow, or high winds), within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### D.4.1.9.6 Future Climate Conditions

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in Cold Bay. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in Cold Bay. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in Cold Bay. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in Cold Bay. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in Cold Bay. | It is unlikely that future climate conditions will influence the nature of future high wind events in Cold Bay. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in Cold Bay. | It is possible that future climate conditions will influence the location of future drought/water supply events in Cold Bay. | It is unlikely that future climate conditions will influence the location of future extreme cold events in Cold Bay. | It is unlikely that future climate conditions will influence the location of future heavy rain events in Cold Bay. | It is unlikely that future climate conditions will influence the location of future heavy snow events in Cold Bay. | It is unlikely that future climate conditions will influence the location of future high wind events in Cold Bay. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in Cold Bay could increase (UAF/SNAP 2025). | In Cold Bay, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026).<br>Climate changes within Alaska is likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In Cold Bay, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in Cold Bay. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP).<br>Extreme precipitation events have occurred throughout Alaska with increasing frequency.<br>In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>Cold Bay experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months. Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). |
| Impact | Projected increases in precipitation and associated moisture availability in Cold Bay could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026).<br>Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in Cold Bay are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities in the Aleutians East Borough (Alaska DHS&EM 2023). | While overall temperature trends in Cold Bay are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In Cold Bay, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+23%) (UAF/SNAP 2026).<br>As precipitation increases, impacts associated with heavy rainfall (localized flooding, landslide potential, roadway washouts, etc.) will increase. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir levels. | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in Cold Bay by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in Cold Bay are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In Cold Bay, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+23%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in Cold Bay are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In Cold Bay, winter is likely to have more precipitation (UAF/SNAP 2026).<br>Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in Cold Bay may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in Cold Bay have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in Cold Bay. | Future conditions of drought are not anticipated to significantly affect population patterns in Cold Bay. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in Cold Bay. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | It is not likely that future conditions influencing heavy rain will impact changes in Cold Bay population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in Cold Bay population patterns. | It is not likely that future conditions influencing high winds will impact changes in Cold Bay population patterns. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in Cold Bay. | Future conditions of drought are not anticipated to substantially affect future land use development in Cold Bay. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in Cold Bay, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in Cold Bay population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in Cold Bay land use development. | It is not likely that future conditions of high winds will impact changes in Cold Bay population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in Cold Bay. | Future conditions of drought may affect subsistence resources in Cold Bay, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days | Future conditions of extreme cold may affect subsistence resources in Cold Bay, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days | It is possible that future conditions of heavy rain will impact changes in Cold Bay land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above Cold Bay, leading to landslide where historically they have not been documented. | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, thermal stress, and nutrient availability for subsistence species. | It is not likely that future conditions of high winds will impact changes in Cold Bay land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | | | |

**Projected Conditions for Cold Bay**

In Cold Bay, average annual temperatures may increase by about 9°F by the end of the century.

Winter temperatures are projected to increase the most (+9°F).

Winter may transition from below freezing to above freezing in the future.

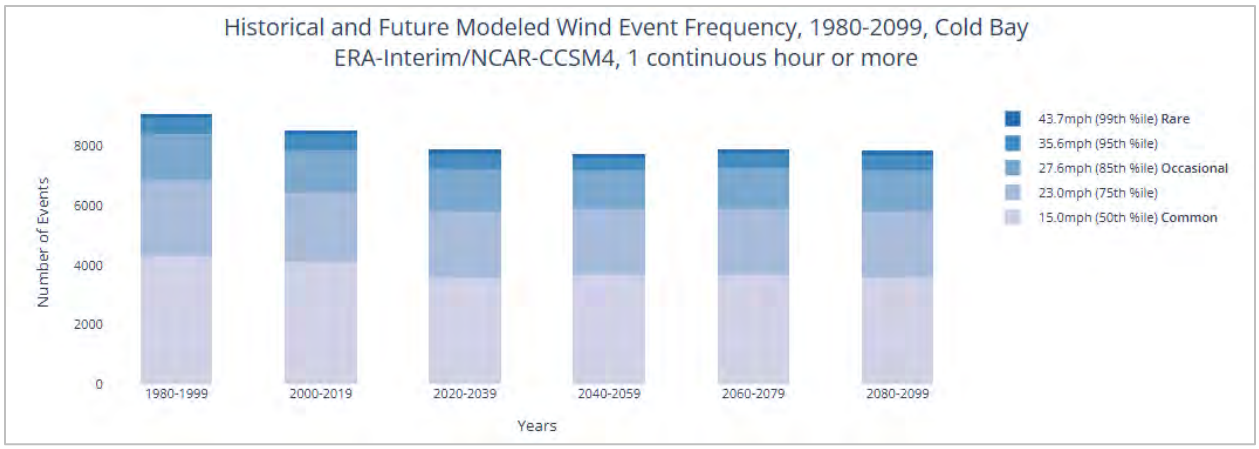
Models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+23%).

In the past, this area had very low flammability. Future flammability may be about the same.

Based on climate and fire-driven shifts, vegetation in this area may be slightly different by the end of the century.

*Source: UAF/SNAP- Northern Climate Reports*

Figure  models historical and future wind event frequency in Cold Bay from 1980 through 2099 (UAF/SNAP 2026). This model predicts a slight decrease in the overall frequency of high wind events in Cold Bay by the end of the century, with a slight decrease in higher wind speeds in general.




Source: UAF/SNAP- Community Wind

**Figure D-11- Historical and Future Modeled Wind Event Frequency in Cold Bay (1980-2099)**

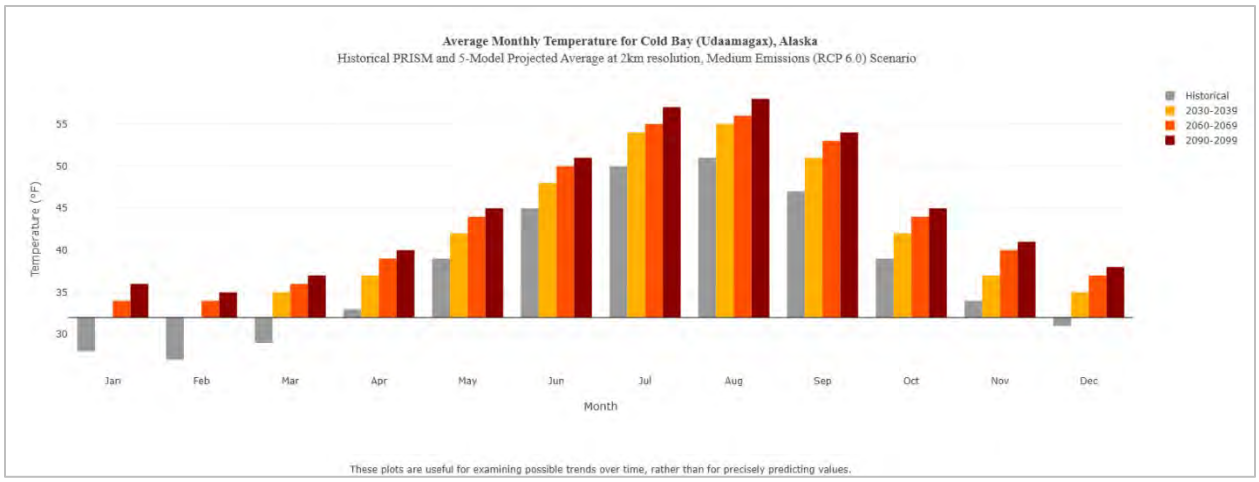
Figure  models historical and future duration of the growing season in Cold Bay from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure D-12- Historical and Future Projected Changes in Growing Season in Cold Bay (1980-2099)**

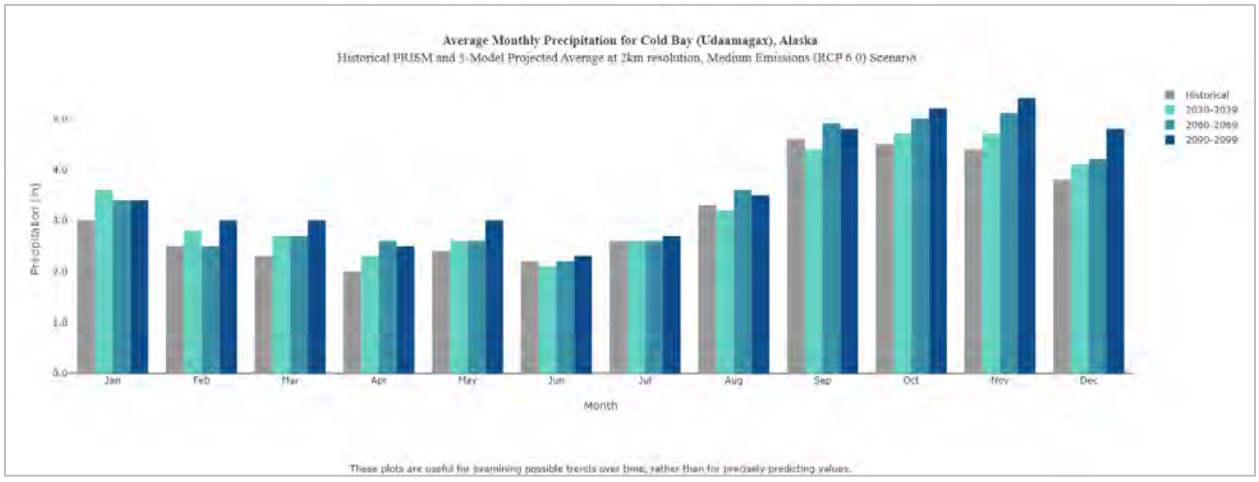
Figure  models historical and future average monthly temperatures in Cold Bay from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure D-13- Historical and Future Projected Average Monthly Temperature in Cold Bay (1980-2099)**

Figure  models historical and future average monthly precipitation in Cold Bay from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure D-14- Historical and Future Projected Average Monthly Precipitation in Cold Bay (1980-2099)**

### D.4.1.10 Tsunami

The City of Cold Bay Planning Team did not select this hazard for the MJHMP update.

Based on DGGS tsunami inundation mapping, Cold Bay is not at risk of tsunami inundation.

Cold Bay is located approximately 100 feet above sea level on a steep bluff, which does not allow for damaging tsunami propagation.

Cold Bay does have a tsunami siren and evacuation route signage throughout the community, but the siren is not regularly tested, and tsunami drills do not take place in the community.

The City of Cold Bay Planning Team has stated that the community has been denied participation in tsunami preparedness workshops due to the lack of tsunami risk.

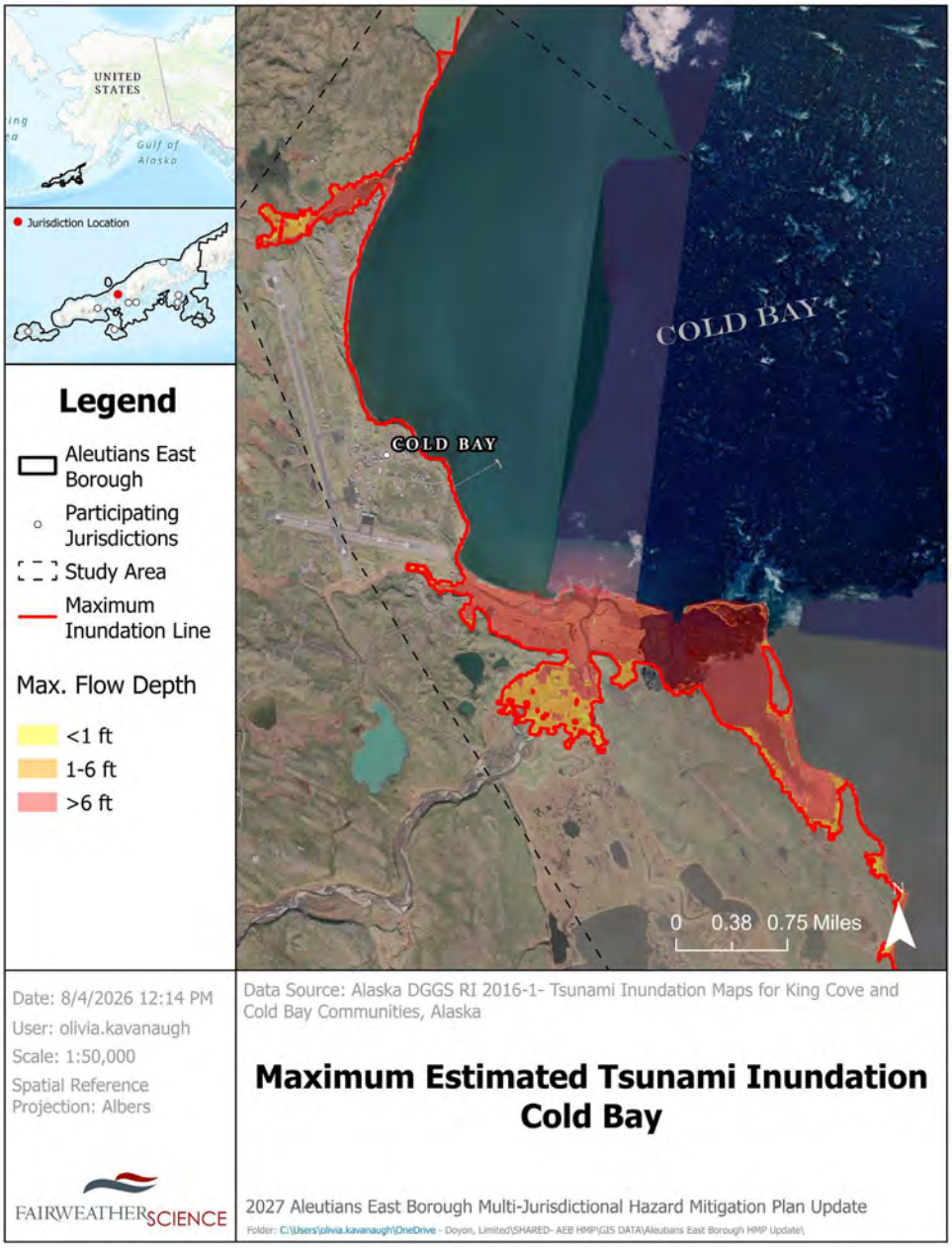



**Figure D-15- Estimated Tsunami Inundation in Cold Bay**

### D.4.1.11 Volcano

#### D.4.1.11.1 Location

The entire geography of Cold Bay is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Shishaldin.

According to the 2023 State of Alaska HMP, Cold Bay is located in a moderate volcanic ash hazard level area.

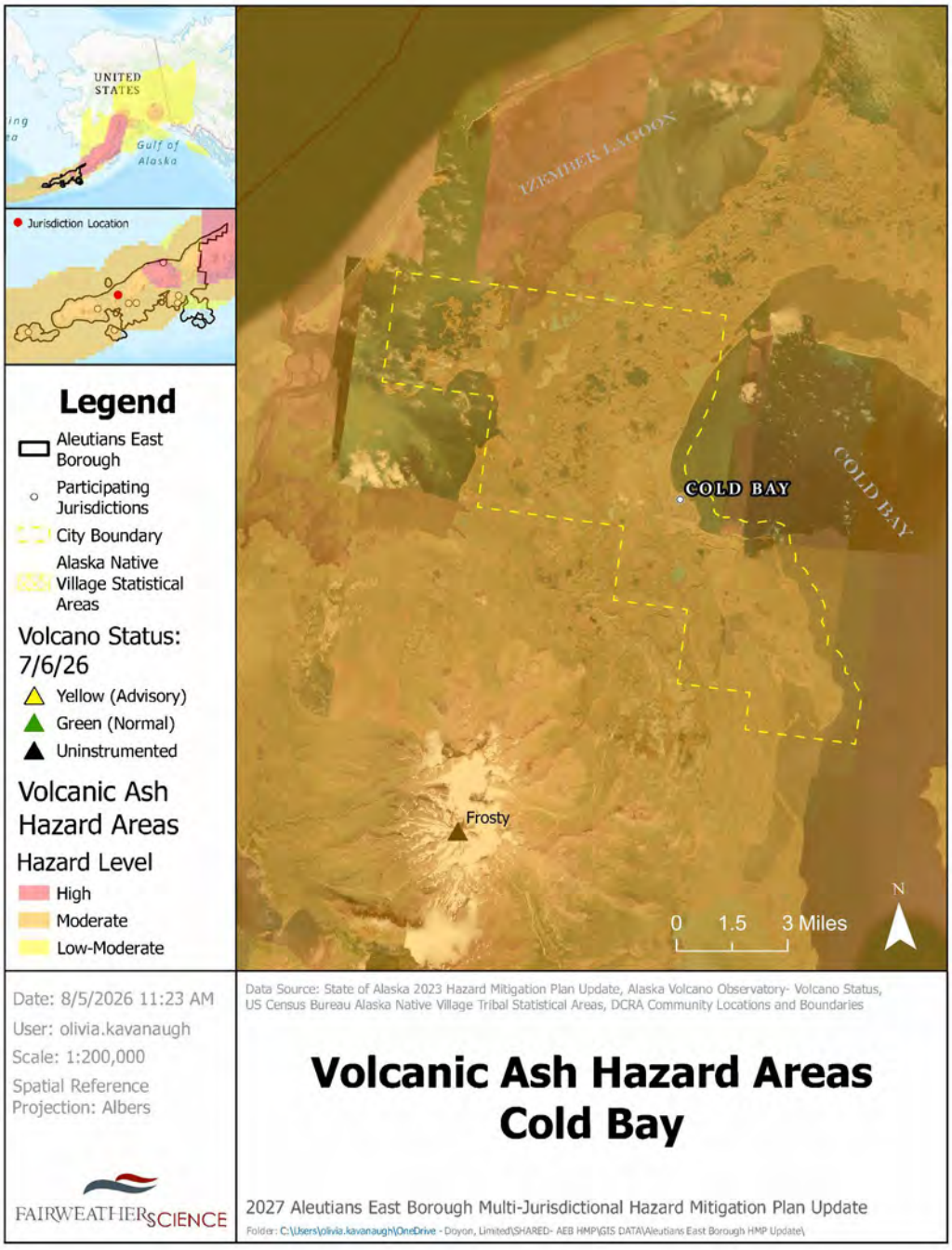



**Figure D-16 -** Cold Bay Volcanic Ash Hazard Area

#### D.4.1.11.2 History

Cold Bay has had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to Cold Bay is **Mount Dutton**, which is approximately 18 miles east of the community. While no volcanic eruption has occurred at Mount Dutton, a 1988 seismic swarm near the volcano resulted in a string of earthquakes being sharply felt in Cold Bay (AVO 2026).

The volcano that has historically caused the most impacts at Cold Bay is **Mount Pavlof**. Located approximately 35 miles northeast of Cold Bay, Pavlof has erupted a total of 31 times since 1900, with several of them resulting in localized impacts. The eruptions in 1986, 1996, 2013, and 2014 resulted in light ash fall accumulating in several AEB communities, including Cold Bay.

**Mount Shishaldin** is a historically active volcano that has resulted in several eruptions that has impacted the AEB, including Cold Bay. Located approximately 58 miles southwest of Cold Bay, Shishaldin has erupted a total of 24 times since 1900. The eruptions in 1955, 1995, 2019, and 2023 resulted in light ash fall accumulating in Cold Bay. Continued ash fall from the 2023 eruption resulted in the closure of the Cold Bay airport for approximately 2 weeks.

#### D.4.1.11.3 Extent (Magnitude and Severity)

Cold Bay is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, Cold Bay has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community.

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcanoes in Cold Bay is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### D.4.1.11.4 Impact

| Description of Previous Impacts | |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding Cold Bay has been ashfall. While the majority of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposits (USGS 2015). |
| Infrastructure | The historical ashfall reported in Cold Bay has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of Cold Bay from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. |
| Utilities | There have been no documented cases of volcanic eruptions causing utility disruptions in Cold Bay. While wet ash can cause power outages by coating insulators and transformers, the ashfall in the community from past eruptions have only resulted in trace amounts scattered throughout Cold Bay (USGS 2015). |
| Transportation | The primary transportation related impact from a volcanic eruption in Cold Bay is aircraft interruptions. Ash clouds from Mount Shishaldin's 2023 eruption caused the Cold Bay Airport to be closed for approximately 2 weeks. |
| Economy | While volcanic ashfall can disrupt Cold Bay's economy by disrupting work and transportation, the historical impact has generally been indirect and limited. |

| Description of Previous Impacts | |
|---|---|
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in Cold Bay that has impacted the community's access to subsistence resources. |

#### D.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact Cold Bay.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** Cold Bay will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### D.4.1.11.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in Cold Bay. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in Cold Bay. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in Cold Bay. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in Cold Bay. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in Cold Bay. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in Cold Bay. |
| Land Use Development | Future climate conditions are not expected to influence land use development in Cold Bay. |
| Subsistence Resources | Future climate conditions are not expected to influence Cold Bay's ability to access subsistence resources. |

### D.4.1.12 Wildland Fire

The City of Cold Bay Planning Team did not select this hazard for the MJHMP.

Cold Bay is located in an area with Very Low to Low Wildfire Exposure Risk (Figure ). Due to lack of available fuels and lack of historical events, the City of Cold Bay Planning Team is not concerned about the City's wildfire risk.

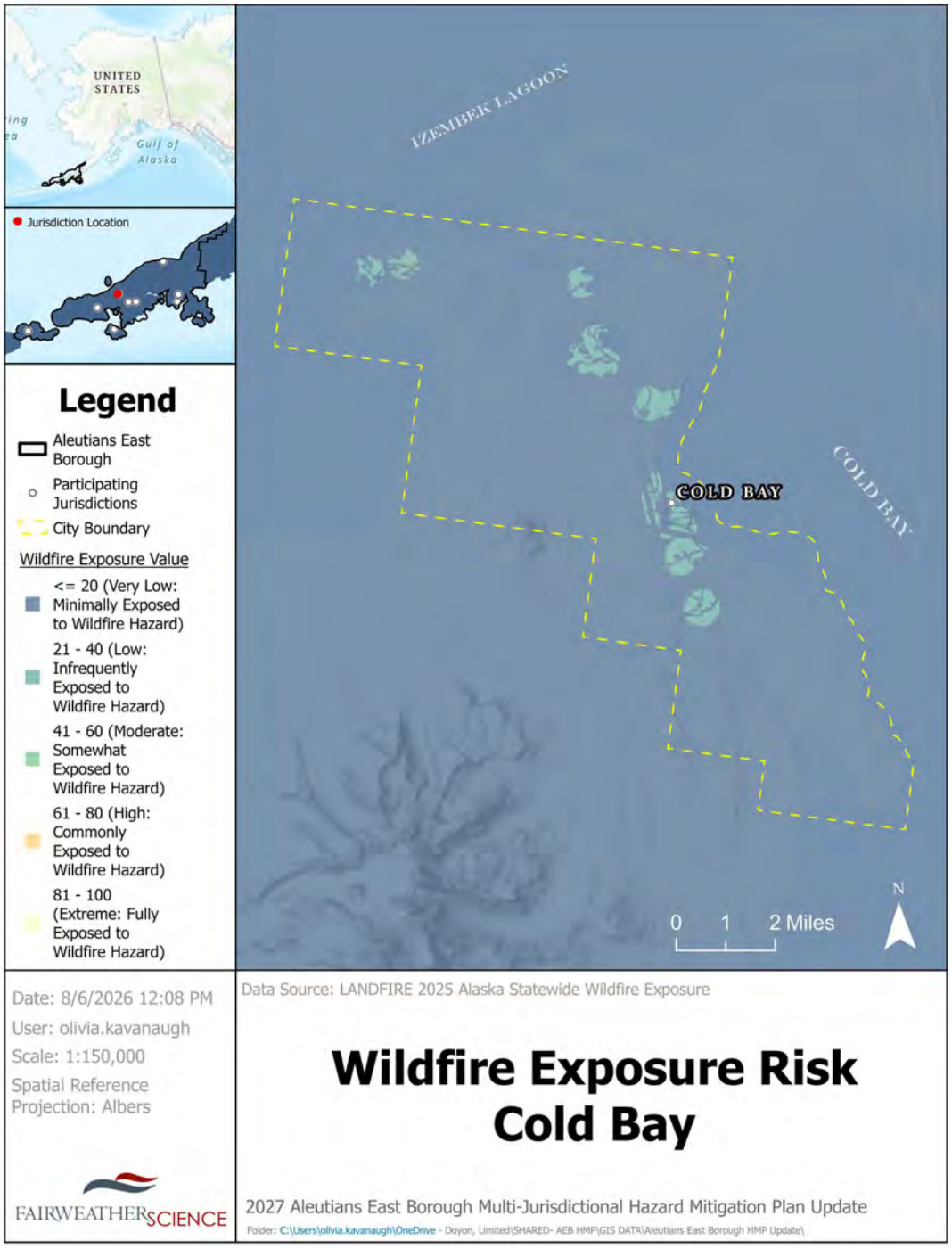
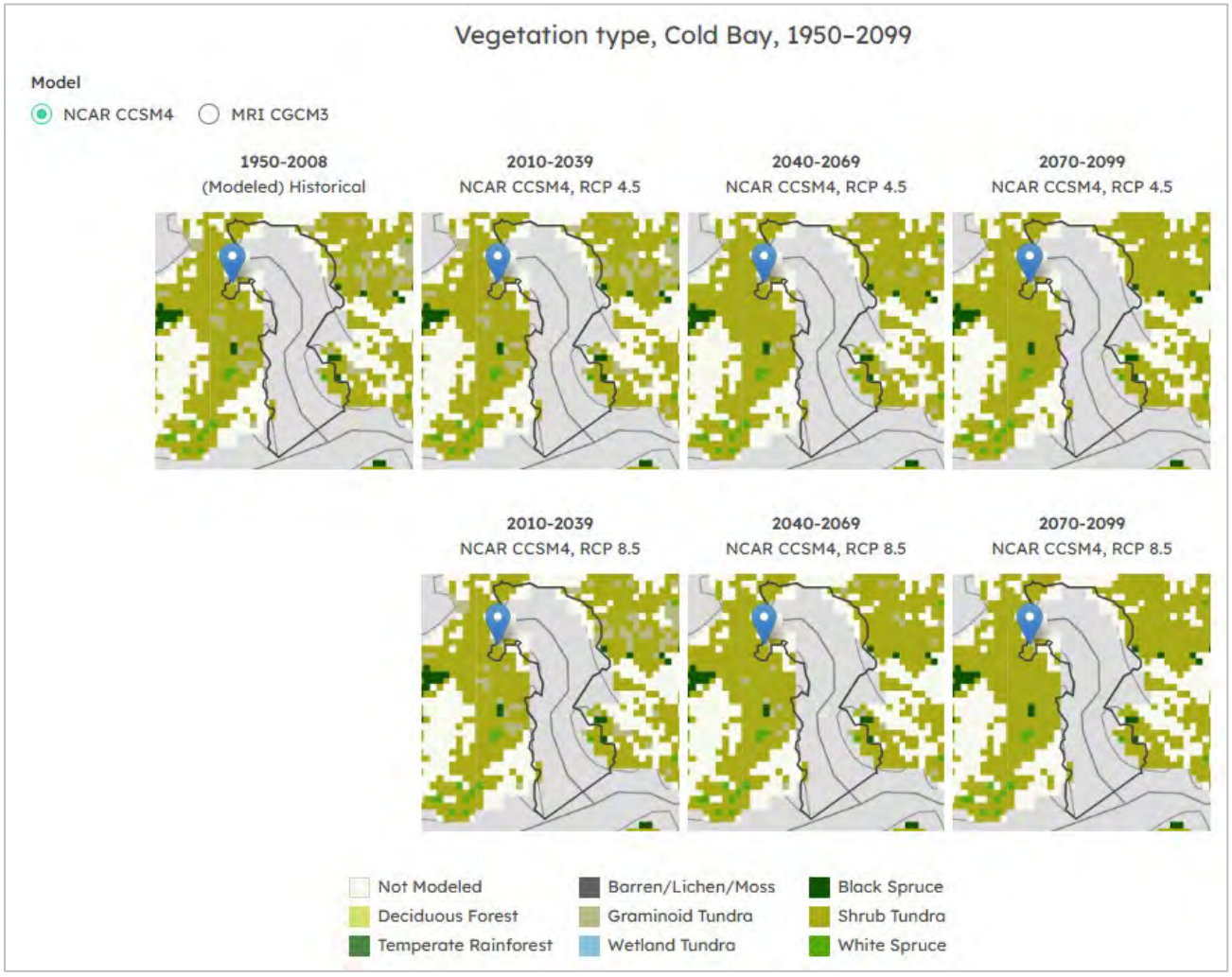



**Figure D-17- Cold Bay Wildfire Exposure Risk**

Vegetation Type: In Cold Bay, the predominant vegetation types are Shrub Tundra, Graminoid Tundra, and Black Spruce (UAF/SNAP 2026). Figure  shows the projected changes in the location of vegetation in Cold Bay from 1950 through year 2099.

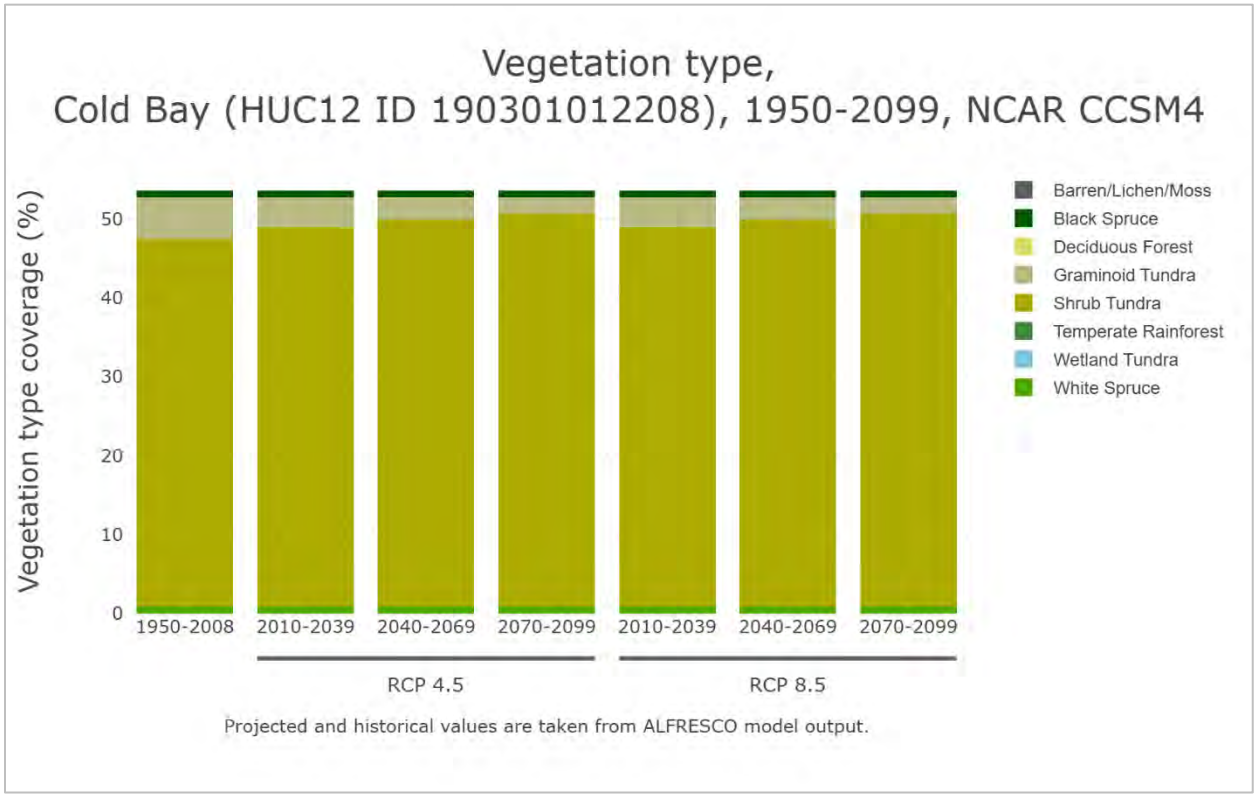



Source: UAF/SNAP 2026- Northern Climate Reports

**Figure D-18- Cold Bay Vegetation Type Map (1950 - 2099)**

Figure  shows historical and projected changes in vegetation type coverage in Cold Bay from 1950 through year 2099.

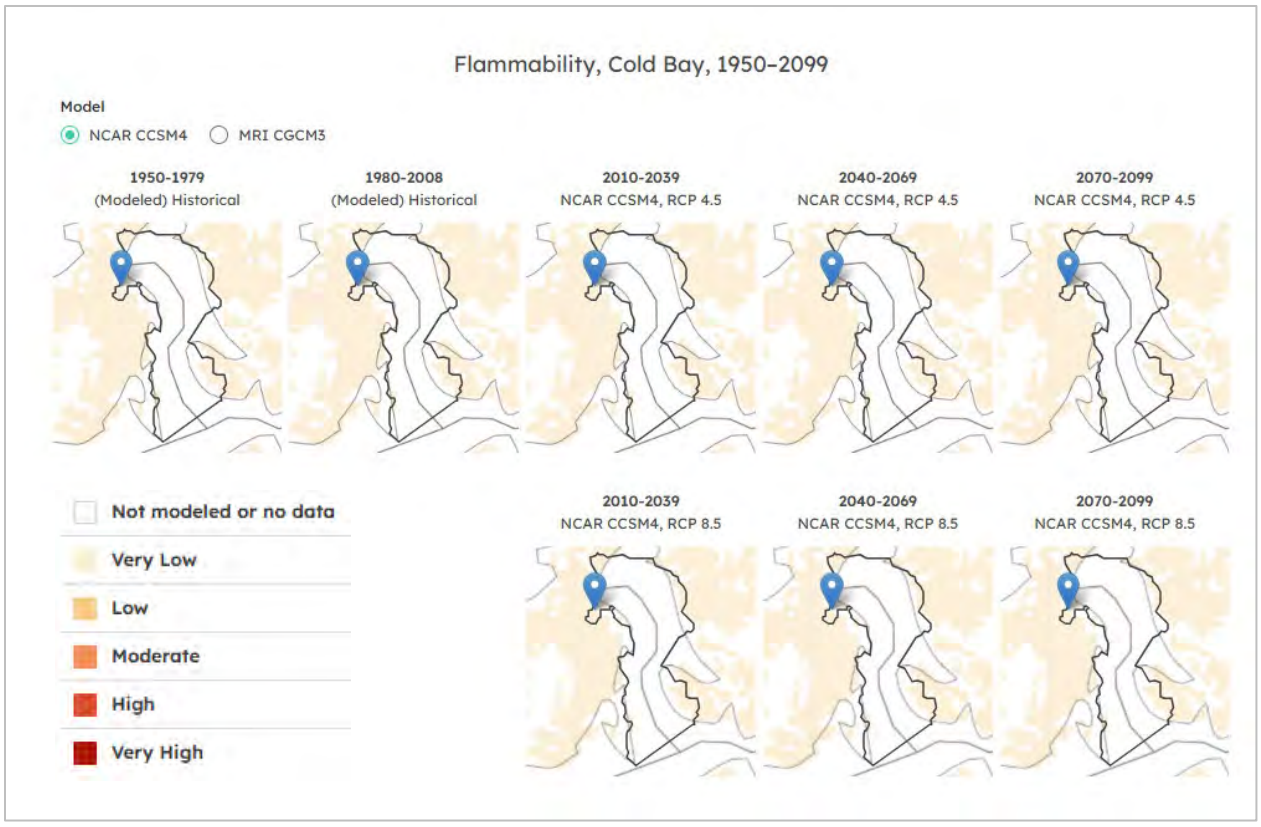
These models predict that the vegetation type in the community will stay relatively consistent through the end of the century, with a slight increase in the presence of Shrub Tundra and decrease in Graminoid Tundra type.




Source: UAF/SNAP 2026- Northern Climate Reports

**Figure D-19- Cold Bay Vegetation Type Graph (1950 - 2099)**

Flammability: Historically, Cold Bay has had Very Low flammability (UAF/SNAP 2026). Under the NCAR CCSM4 climate model, areas within Cold Bay are expected to remain Very Low flammability through the end of the century (Figure 46).




Source: UAF/SNAP 2026- Northern Climate Reports

**Figure D-20- Cold Bay Historical and Projected Flammability (1950 - 2099)**

## D.4.2 Critical Facilities

**Table D-8- Critical Facilities- City of Cold Bay**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | City of Cold Bay | Commercial | 50 | Bearfoot Inn and Store | 102 Flying Tiger Way | 55.203286 | -162.716191 | $500,000 | | Private | | | | x | | | | x | | x | | | |
| 2 | City of Cold Bay | Community | 10 | Cold Bay Chapel | Borough Dr | 55.207156 | -162.719478 | $500,000 | | Private | | | | x | | | | x | | x | | | |
| 3 | City of Cold Bay | Community | 20 | US Post Office | 1 Letty Ave | 55.202164 | -162.71675 | $500,000 | | Federal | | | | x | | | | x | | x | | | |
| 4 | City of Cold Bay | Community | 20 | Community Center | 10 Baranov Rd | 55.207184 | -162.71438 | $500,000 | | City | | | | x | | | | x | | x | | | |
| 5 | City of Cold Bay | Community | 20 | Municipal Building & Public Library | 1 Municipal Ln | 55.206579 | -162.715096 | $1,000,000 | | City | | | | x | | | | x | | x | | | |
| 6 | City of Cold Bay | Government | 0 | Cold Bay Weather Services | St Louis Rd | 55.212426 | -162.723773 | $1,000,000 | | | | | | x | | | | x | | x | | | |
| 7 | City of Cold Bay | Government | 0 | Alaska Department of Fish & Game | Fish and Game Rd | 55.210648 | -162.72297 | $500,000 | | State | | | | x | | | | x | | x | | | |
| 8 | City of Cold Bay | Government | 10 | US Coast Guard | N Apron Rd | 55.202403 | -162.71878 | $1,000,000 | | Federal | | | | x | | | | x | | x | | | |
| 9 | City of Cold Bay | Government | 5 | DOT Shop | Kennedy Rd | 55.206013 | -162.718948 | $500,000 | | State | | | | x | | | | x | | x | | | |
| 10 | City of Cold Bay | Government | 2 | FAA Chief Barnett Shop | Kennedy Rd | 55.205896 | -162.71852 | $500,000 | | | | | | x | | | | x | | x | | | |
| 11 | City of Cold Bay | Government | 0 | FAA Weather Cam | Mitchell Ave | 55.203604 | -162.712071 | $1,000,000 | | City | | | | x | | | | x | | x | | | |
| 12 | City of Cold Bay | Government | 5 | Izembek National Wildlife Refuge Office and Visitors Center | 1 Izembek St | 55.207686 | -162.714234 | $500,000 | | | | | | x | | | | x | | x | | | |
| 13 | City of Cold Bay | Government | 0 | RADAR site | Baldy Vlg Rd | 55.24527818 | -162.769853 | $5,000,000 | | Federal | | | | x | | | | x | | x | | | |
| 14 | City of Cold Bay | Medical | 20 | Clinic | 65 Airport Way | 55.201043 | -162.718028 | $1,000,000 | | | | | | x | | | | x | | x | | | |
| 15 | City of Cold Bay | Transportation | 0 | Airstrip | | 55.19873548 | -162.721268 | $50,000,000 | ~15,000 ft runway asphalt | State | | | | x | | | | x | | x | | | |
| 16 | City of Cold Bay | Transportation | 0 | Airport Terminal | 1 Flying Tiger Way | 55.207611 | -162.722487 | $7,045,300 | | | | | | x | | | | x | | x | | | |
| 17 | City of Cold Bay | Transportation | 0 | ADOT&PF Fire and Rescue | 97 St. Louis Avenue | 55.203737 | -162.720019 | $1,000,000 | | | | | | x | | | | x | | x | | | |
| 18 | City of Cold Bay | Transportation | 0 | Boat Ramp | Dock Rd | 55.204309 | -162.703089 | $20,000,000 | ~ 1,870 ft dock | | | | | x | | | | x | | x | | | |
| 19 | City of Cold Bay | Transportation | 0 | Cold Bay Dock | Dock rd | 55.20727 | -162.695874 | $60,000,000 | | AEB | | x | | x | | | | x | | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | City of Cold Bay | Utilities | 0 | Land Fill | Land Fill Rd | 55.221743 | -162.727319 | $500,000 | | City | | | | x | | | | x | | x | | | |
| 21 | City of Cold Bay | Utilities | 0 | Frosty Fuels 1 | 17 N Apron Rd | 55.20344 | -162.719587 | $1,000,000 | | Aleut | | | | x | | | | x | | x | | | |
| 22 | City of Cold Bay | Utilities | 0 | Frosty Fuels 2 | S Apron Rd | 55.200547 | -162.716458 | $1,000,000 | | Aleut | | | | x | | | | x | | x | | | |
| 23 | City of Cold Bay | Utilities | 0 | Frosty Fuel Hangar Building | S Apron Rd | 55.200541 | -162.716012 | $5,000,000 | | Aleut | | | | x | | | | x | | x | | | |
| 24 | City of Cold Bay | Utilities | 0 | Frosty Fuel Farm | Reeve Ave | 55.201483 | -162.715741 | $20,000,000 | | Aleut | | | | x | | | | x | | x | | | |
| 25 | City of Cold Bay | Utilities | 0 | Sewer Lagoon 1 | Lagoon Rd | 55.209085 | -162.717301 | $100,000 | | | | | | x | | | | x | | x | | | |
| 26 | City of Cold Bay | Utilities | 0 | Sewer Lagoon 2 | Lagoon Rd | 55.20871 | -162.71723 | $100,000 | | | | | | x | | | | x | | x | | | |
| 27 | City of Cold Bay | Utilities | 0 | City Water Treatment | 32 Buckner St | 55.203637 | -162.711666 | $500,000 | | City | | | | x | | | | x | | x | | | |
| 28 | City of Cold Bay | Utilities | 0 | Water Tank | 32 Buckner St | 55.203283 | -162.7116 | $1,000,000 | | City | | | | x | | | | x | | x | | | |
| 29 | City of Cold Bay | Utilities | 0 | Telecommunication Tower 1 | Buckner St | 55.20664476 | -162.714226 | $20,000,000 | | | | | | x | | | | x | | x | | | |
| 30 | City of Cold Bay | Utilities | 0 | Telecommunication Tower 2 | S Apron Rd | 55.20086015 | -162.716388 | $20,000,000 | | | | | | x | | | | x | | x | | | |
| 31 | City of Cold Bay | Utilities | 0 | G&K Power Plant | Electric Ln | 55.20596782 | -162.715798 | $20,000,000 | | | | | | x | | | | x | | x | | | |
| **Total Occupants:** | | | **162** | **Total Estimated Value:** | | | | **$241,245,300** | | | | | | | | | | | | | | | |




**Figure D-21- City of Cold Bay Critical Facilities Map 1 of 2**




**Figure D-22- City of Cold Bay Critical Facilities Map 2 of 2**

## D.4.3 Summary of Vulnerability

**Table D-9- Jurisdictional Summary of Vulnerability- City of Cold Bay**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | 1 | 0 | $60,000,000 | 0 | 0 | $0 |
| Cryosphere-Snow Avalanche | Did not profile this hazard | | | | | |
| Earthquake | 31 | 162 | $241,245,300 | 53 | 216 | $39,143,952 |
| Sediment Deterioration and Land Destabilization | Did not profile this hazard | | | | | |
| Flood | Did not profile this hazard | | | | | |
| Ground Failure/ Landslide | Did not profile this hazard | | | | | |
| Severe Weather | 31 | 162 | $241,245,300 | 53 | 216 | $39,143,952 |
| Tsunami | Did not profile this hazard | | | | | |
| Volcano | 31 | 162 | $241,245,300 | 53 | 216 | $39,143,952 |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | Did not profile this hazard | | | | | |
| Invasive Species | 0 | 0 | $0 | 0 | 0 | $0 |

Cold Bay's vulnerability to natural hazards extends beyond potential damage to buildings and infrastructure. Subsistence fishing and hunting are part of the local culture, and community access to surrounding lands, waters, and wildlife resources therefore represents an additional consideration when evaluating vulnerability. Hazard-related disruptions to transportation and supply systems may also create community consequences that are not fully represented in the quantitative exposure estimates above.

## D.5 Capability Assessment

***Note: the City of Cold Bay does not participate in the National Flood Insurance Program (NFIP).***

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| **Plans** | | |
| Capital Improvements Plan | Yes | |
| Climate Change Adaptation Plan | No | |
| Community Wildfire Protection Plan | No | |
| Comprehensive/Master Plan | No | |
| Continuity of Operations Plan | No | |
| Economic Development Plan | No | |
| Land Use Plan | No | |
| Local Emergency Operations Plan | No | |
| Stormwater Management Plan | No | |
| Transportation Plan | No | |
| **Land Use Planning and Ordinances** | | |
| Acquisition of land for open space and public recreation use | No | |
| Building code | No | |
| Flood insurance rate maps | No | |
| Floodplain ordinance | No | |
| Substantial Damage Plan | No | |
| Natural hazard specific ordinance (stormwater, steep slope, wildfire) | No | |
| Subdivision ordinance | No | |
| Zoning ordinance | No | |
| **Administrative** | | |
| Chief Building Official | No | |
| Civil Engineer | No | |
| Community Planner | No | |
| Emergency Manager | No | |

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| Floodplain Administrator | No | |
| GIS Coordinator | No | |
| Planning Commission | No | |
| **Technical** | | |
| Grant writing | Yes | |
| Hazard data and information | Yes | |
| GIS analysis | No | |
| Mutual aid agreements | Yes | |
| **Funding Resources** | | |
| Capital improvements project funding | No | |
| Community Development Block Grant | No | |
| Federal funding programs (non-FEMA) | Yes | |
| Fees for water, sewer, gas, or electric services | Yes | |
| Impact fees for new development | No | |
| State funding programs | Yes | Library grants |
| Stormwater utility fee | No | |
| **Community Programs/Organizations** | | |
| Community newsletters | No | |
| Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events) | No | |
| Local news | No | |
| Organizations that represent/advocate for/interact with underserved and vulnerable communities/populations | No | |
| Social media | Yes | |

# D.6 Mitigation Strategy

## D.6.1 Mitigation Goals

The City of Cold Bay's mitigation goals are:

1. Enhance climate protection and adaptation efforts
2. Create a healthy and safe community
3. Protect critical facilities and infrastructure against hazards

## D.6.2 Status of Mitigation Actions Identified in the 2022 City of Cold Bay HMP

The City of Cold Bay reviewed mitigation actions identified in the 2022 City of Cold Bay HMP and provided a status update for each action.

- ***Completed***- this action has been completed
- ***In Progress/Ongoing***- this action has been started is currently in-progress or ongoing
- ***Not Started***- this action has not been started

| ID | Action | Status |
|---|---|---|
| **1** | Establish a formal role for the hazard mitigation planning team to develop a sustainable process to implement, monitor, review, and evaluate community-wide mitigation actions. | Not Started<br>A formal role has not been established but formed as needed to complete HMP update |
| **2** | Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short term power disruption (e.g., water and sewage plant). | In Progress |
| **3** | Prepare an Emergency Operations Plan. As part of that plan, identify a location to act as an emergency command center and evacuation shelter in the event of a natural disaster. Facility would house shelter supplies, provisions, and medical supplies. Identify a person(s) in the community to oversee response and logistics of emergency response. | Not Started |
| **4** | Monitor for potential adverse corrosion effects of saltwater on steel reinforcement and other system components and mitigate as needed. | Ongoing |
| **5** | Seismically retrofit existing critical facilities to make them more resistant to earthquakes. | Not Started |
| **6** | Replace aging critical pipes in areas of extreme or violent shaking hazard areas to improve seismic reliability and safeguard critical water distribution lines against the potential destructive impacts of large-scale earthquakes. | Not Started |
| **7** | Complete certification for the StormReady program. The program encourages communities to take a proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations. | Not Started |

| ID | Action | Status |
|---|---|---|
| **8** | Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms. Consider developing incentive programs. | Completed. All electrical lines are already underground. |
| **9** | Reinforce critical facilities and homes against high winds. | Ongoing |
| **10** | Evaluate capability of potable water and/or wastewater treatment plants to deal with high turbidity from ashfall events, and upgrade water and wastewater treatment facilities as necessary. | Not Started |
| **11** | Participate in the Hazard Analysis & Critical Control Point Planning to prevent the spread of invasive species program offered by the USFWS National Conservation Training Center. The program is a structured process that assesses a natural resource management activity, identifies possible risks, and facilitates the removal or reduction of non-target species. | Ongoing |
| **12** | Work with the USFWS to develop and implement an Invasive Species Management Plan to minimize the introduction and spread of non-native species in the city and the Izembek National Wildlife Refuge. The plan should include specific strategies such as cleaning incoming equipment, vessels, and floatplanes of extraneous soil and debris when they enter Cold Bay. | Ongoing |

## D.6.3 2027 Mitigation Action Plan

**Table D-10- 2027 Mitigation Action Plan- City of Cold Bay**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | All Hazards | Establish an annual meeting to review the annual plan review checklist in January. | H | City Manager | FEMA HMA; FEMA EMPG; AK DHS&EM; Denali Commission | Plans and Regulations | All | 0-2 years | B/C: This project would improve preparedness and coordination by ensuring the community regularly reviews emergency planning needs and identifies necessary updates.<br>TF: This project is technically feasible through an annual review process using an established checklist and participation from relevant community representatives | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Continuity of Operations Plan; Comprehensive Plan |
| 2 | All Hazards | Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short term power disruption (e.g., water and sewage plant). | H | City Manager/Public Works Director | FEMA HMA; FEMA HMGP; USDA RD; USDA RUS; Denali Commission; AK DHS&EM | Structure and Infrastructure Projects | All | 0-2 years | B/C: This project would provide backup power to critical facilities and help maintain essential water and wastewater services during short-term power disruptions.<br>TF: This project is technically feasible using commercially available generators and power distribution equipment but may require site-specific electrical engineering and installation. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Water System/Utility |
| 3 | All Hazards | Prepare an Emergency Operations Plan. | H | City Manager | FEMA EMPG; FEMA HMA; AK DHS&EM; Denali Commission | Plans and Regulations | All | 0-2 years | B/C: This project would establish procedures and responsibilities for responding to emergencies and help coordinate community response activities during hazardous events.<br>TF: This project is technically feasible using established emergency planning guidance and coordination with local, State, and Federal agencies. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Emergency Response Plan; Emergency Preparedness Plan; Comprehensive Plan |
| 4 | All Hazards | identify a location to act as an emergency command center and<br>evacuation shelter in the event of a natural disaster. | H | City Manager | FEMA HMA; FEMA HMGP; FEMA EMPG; AK DHS&EM; Denali Commission | Plans and Regulations | N/A | 0-2 years | B/C: Identifying an emergency command center and evacuation shelter would provide designated locations for coordinating response activities and supporting residents displaced by a disaster.<br>TF: This project is technically feasible through assessment of available facilities and may require upgrades to meet emergency power, communications, accessibility, and sheltering needs. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Emergency Evacuation Plan; Shelter Plan; Comprehensive Plan |
| 5 | All Hazards | Identify a person(s) in the community to oversee response and logistics of emergency response. | H | City Manager | FEMA EMPG; AK DHS&EM; Denali Commission | Plans and Regulations | N/A | 0-2 years | B/C: This project would establish clear responsibility for coordinating emergency response and logistics, improving communication and organization during a disaster.<br>TF: This project is technically feasible through designation of community personnel and development of clear response roles and procedures. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Continuity of Operations Plan; Comprehensive Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | All Hazards | Public education on hazards that are unlikely to pose a threat to Cold Bay (tsunami, flooding, erosion) | L | City Manager | FEMA EMPG; FEMA HMA; NOAA; AK DHS&EM; AK DGGS | Education and Awareness Programs | All | 0-2 years | B/C: Public education on tsunami, flooding, and erosion hazards would improve general hazard awareness and help residents understand potential risks that could affect the community.<br>TF: This project is technically feasible using established public outreach methods and State and Federal hazard information. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Public Information/Outreach Plan; Emergency Preparedness Plan; Comprehensive Plan |
| 7 | Cryosphere-Sea Ice | Install ice disrupters (or other tool, such as de-icers or bubblers) on the City Dock to prevent ice runup | H | City Manager | FEMA HMA; FEMA HMGP; USACE; NOAA; AK DOT&PF; Denali Commission | Structure and Infrastructure Projects | City Dock | 3-4 years | B/C: Installing ice disrupters or other ice-management equipment would reduce ice accumulation and runup at the City Dock and help protect dock infrastructure and access.<br>TF: This project is technically feasible using commercially available ice-management equipment but may require site-specific engineering, permitting, and routine maintenance. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Port/Harbor Plan; Capital Improvement Plan; Comprehensive Plan |
| 8 | Cryosphere-Sea Ice | Track wildlife mortality (sea birds and otters) to determine if sea ice is responsible and report to USFWS | H | City Manager | USFWS; NOAA; AK Dept. of Fish & Game; USGS; FEMA EMPG | Natural Systems Protection | N/A | 0-2 years | B/C: Tracking wildlife mortality would improve understanding of potential relationships between sea ice conditions and impacts to seabirds and otters and support resource management decisions.<br>TF: This project is technically feasible using established wildlife monitoring and reporting methods in coordination with USFWS. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Environmental Plan; Natural Resources Plan; Public Information/Outreach Plan; Comprehensive Plan |
| 9 | Earthquake | Participate in the Great Alaska Shakeout Drills | L | City Manager | FEMA EMPG; FEMA HMA; AK DHS&EM; AK Earthquake Center/UAF | Education and Awareness Programs | All | 0-2 years | B/C: Participating in the Great Alaska ShakeOut would improve earthquake preparedness by giving community members an opportunity to practice appropriate protective actions.<br>TF: This project is technically feasible through coordination with the ShakeOut program and established earthquake preparedness guidance. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Comprehensive Plan |
| 10 | Earthquake | Backup generators for critical facilities (community center and city hall) | H | City Manager, Public Works | FEMA HMA; FEMA HMGP; USDA RD; Denali Commission; AK DHS&EM | Structure and Infrastructure Projects | All | 0-2 years | B/C: Backup generators would provide emergency power to the community center and City Hall, helping maintain essential services during power outages.<br>TF: This project is technically feasible using commercially available generators and appropriate electrical connections, with routine maintenance required. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Continuity of Operations Plan; Facilities Management Plan; Capital Improvement Plan; Comprehensive Plan |
| 11 | Flood | Monitor for potential adverse corrosion effects of saltwater on steel reinforcement and other system components and mitigate as needed. | H | Public works, Building Maintenance | FEMA HMA; FEMA HMGP; USACE; AK DEC; AK DGGS; Denali Commission | Structure and Infrastructure Projects | All | 0-2 years | B/C: Monitoring corrosion would help identify deterioration of critical infrastructure and allow maintenance or mitigation measures to be implemented before system components are significantly damaged. | Existing Plans: Economic Development Plan.<br>Future Plans: Water System/Utility Plan; Capital Improvement Plan; Facilities Management Plan; Comprehensive Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | TF: This project is technically feasible using established inspection and corrosion-monitoring methods but may require specialized technical assistance. | |
| 12 | Invasive Species | Participate in the Hazard Analysis & Critical Control Point Planning to prevent the spread of invasive species program offered by the USFWS National Conservation Training Center. The program is a structured process that assesses a natural resource management activity, identifies possible risks, and facilitates the removal or reduction of non-target species. | H | City Manager | USFWS; FEMA HMA; FEMA EMPG; AK DEC; Denali Commission | Plans and Regulations | N/A | 0-2 years | B/C: Participating in Hazard Analysis & Critical Control Point Planning would help identify pathways for invasive species introduction and develop measures to reduce the spread of non-target species.<br>TF: This project is technically feasible through participation in the USFWS training program and application of established hazard analysis methods. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Environmental Plan; Natural Resources Plan; Emergency Preparedness Plan; Comprehensive Plan |
| 13 | Invasive Species | Work with the USFWS to develop and implement an Invasive Species Management Plan to minimize the introduction and spread of non-native species in the city and the Izembek National Wildlife Refuge. The plan should include specific strategies such as cleaning incoming equipment, vessels, and floatplanes of extraneous soil and debris when they enter Cold Bay. | H | City Manager | USFWS; USDA; FEMA HMA; AK DEC; Denali Commission | Plans and Regulations | Coastal Facilities | 0-2 years | B/C: This project would establish coordinated strategies to reduce the introduction and spread of invasive species in Cold Bay and the Izembek National Wildlife Refuge.<br>TF: This project is technically feasible through coordination with USFWS and implementation of established invasive species prevention and management practices. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Environmental Plan; Natural Resources Plan; Comprehensive Plan; Emergency Preparedness Plan |
| 14 | Invasive Species | In coordination with USFWS, conduct a community-wide invasive plant and animal survey event, and ensure that the results get uploaded on AKEPIC database. | H | City Manager | USFWS; USDA; AKEPIC; AK DEC; FEMA EMPG | Plans and Regulations | N/A | 0-2 years | B/C: A community-wide invasive species survey would improve understanding of invasive plant and animal populations and help prioritize future management actions.<br>TF: This project is technically feasible using established survey methods, community participation, USFWS coordination, and the AKEPIC database. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Environmental Plan; Natural Resources Plan; Public Information/Outreach Plan; Comprehensive Plan |
| 15 | Invasive Species | Invest in invasive species education throughout the community (website, public info signs at popular outdoor recreation sites/trailheads). | H | City Manager | USDA; USFWS; NOAA; AK DEC; AK Dept. of Fish & Game; FEMA EMPG | Education and Awareness Programs | Trails, Recreation/Subsistence Sites | 0-2 years | B/C: This project would increase public awareness of invasive species and encourage actions that can reduce their introduction, spread, and impacts on the local environment.<br>TF: This project is technically feasible through public outreach, signage, website information, and community education activities. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Environmental Plan; Natural Resources Plan; Public Information/Outreach Plan; Comprehensive Plan |
| 16 | Severe Weather | Community awareness related to severe weather (extreme cold) and continue to tie loose items at critical facilities to mitigate | H | City Manager, Public Works | FEMA EMPG; FEMA HMA; AK DHS&EM; AK DGGS; NOAA | Education and Awareness Programs | All | 0-2 years | B/C: Community awareness of severe winter weather would help residents prepare for extreme cold and reduce potential impacts from unsecured objects and severe weather conditions.<br>TF: This project is technically feasible using public outreach and established severe weather preparedness guidance, with routine inspection and securing of items at critical facilities. | Existing Plans: Economic Development Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Facilities Management Plan; Comprehensive Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Volcano | Evaluate capability of potable water and/or wastewater treatment plants to deal with high turbidity from ashfall events, and upgrade water and wastewater treatment facilities as necessary. | M | City Manager | FEMA HMA; FEMA HMGP; EPA; USDA RD; USGS/AVO; AK DEC; Denali Commission | Plans and Regulations | Water and Wastewater Treatment Facilities | 0-2 years | B/C: This project would help ensure potable water and wastewater facilities can continue operating during ashfall events and reduce potential impacts from increased turbidity.<br>TF: This project is technically feasible through facility assessment and upgrades to treatment processes or equipment as needed, with specialized engineering support where required. | Existing Plans: Economic Development Plan. Future Plans: Water System/Utility Plan; Capital Improvement Plan; SCERP/EOP; Continuity of Operations Plan; Comprehensive Plan |
| 18 | Volcano | Public education on potential risks from volcanic ashfall, and what to do in the event of an eruption | M | City Manager | FEMA EMPG; FEMA HMA; USGS/AVO; AK DHS&EM; AK DEC | Education and Awareness Programs | All | 0-2 years | B/C: Public education on volcanic ashfall would help residents understand potential health and property impacts and take appropriate protective actions during an eruption.<br>TF: This project is technically feasible using established public outreach methods and State and Federal ashfall preparedness guidance. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Public Information/Outreach Plan; Emergency Preparedness Plan; Comprehensive Plan |
| 19 | Volcano | Create volcano emergency kits for residents to pick up from City office. | H | City Manager | FEMA HMA; FEMA EMPG; USGS/AVO; AK DHS&EM; AK DEC | Education and Awareness Programs | All | 0-2 years | B/C: Emergency volcano kits would provide residents with basic supplies to protect their health, vehicles, and property during an ashfall event.<br>TF: This project is technically feasible using commercially available protective supplies and established volcanic ashfall preparedness guidance. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Comprehensive Plan |

### D.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Seismically retrofit existing critical facilities to make them more resistant to earthquakes. | Not a current priority. |
| Replace aging critical pipes in areas of extreme or violent shaking hazard areas to improve seismic reliability and safeguard critical water distribution lines against the potential destructive impacts of large-scale earthquakes. | Not a current priority. |
| Bring the DHS&EM "Quake Cottage" to Cold Bay for earthquake simulation and education | Not a current priority. |
| Identify buildings and facilities that must be able to remain operable during and following an earthquake event | Not a current priority. |
| Complete certification for the StormReady program. The program encourages communities to take a proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations. | Not a current priority. |
| Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms. Consider developing incentive programs. | Not a current priority. |
| Reinforce critical facilities and homes against high winds. | Not a current priority. |
| Implement a housing weatherization program to mitigate damages from high wind and extreme cold events | Not a current priority. |
| Conduct special awareness activities, such as Winter Weather Awareness Week | Not a current priority. |
| Evaluate capability of potable water and/or wastewater treatment plants to deal with high turbidity from ashfall events, and upgrade water and wastewater treatment facilities as necessary. | Not a current priority. |
| Obtain funding to create airplane mitigation "kit" to protect planes and airport operations during ashfall (plastic covering for engines, equipment to remove ash on planes, etc.) | Not a current priority. |
| Develop an ashfall response and cleanup plan | Not a current priority. |

# D.7 Plan Update

## D.7.1 Changes in Development, including in Hazard-Prone Areas (Current and Future)

### D.7.1.1 Changes in Development Since 2022

Since 2022, in Cold Bay, an old, dilapidated facility has been remodeled for use, and two more facilities are in the process of renovation.

The remodeling of these facilities has not changed the City's overall vulnerability to natural hazards.

### D.7.1.2 Future/Planned Development

Future development in Cold Bay includes construction of the King Cove to Cold Bay Road, a major transportation project that will provide a roadway connection from King Cove to the Cold Bay Airport and improve access to regional services and emergency transportation.

This planned development is not anticipated to substantially increase or decrease the City's overall vulnerability to natural hazards; however, erosion is a potential concern associated with development and road construction. Disturbance of soils and vegetation, changes in drainage patterns, and increased runoff could contribute to localized erosion, particularly in areas susceptible to coastal, riverine, or stormwater-related erosion.

## D.7.2 Changes in Priorities and Mitigation Efforts

The City's mitigation priorities have not changed since 2022.

# D.8 Plan Maintenance

## D.8.1 Planning Team MJHMP Maintenance Commitment

The City of Cold Bay is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.6.

The City of Cold Bay is committed to annually reviewing the Plan and City staff will work to complete their review responsibilities.

## D.8.2 Continued Public Involvement

The City of Cold Bay is dedicated to continued public involvement over the next five years.

The City of Cold Bay will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2031.

Future engagement should also provide opportunities for community members to identify new local observations, environmental changes, subsistence-related impacts, access concerns, and other locally relevant knowledge that may affect hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Community-provided information considered for incorporation into the MJHMP should be reviewed for appropriate attribution, sensitivity, and public disclosure.

## D.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The City of Cold Bay jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The City Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### D.8.3.1.1 Implementing

Upon adoption of the Plan, the City of Cold Bay will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The City will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### D.8.3.1.2 Monitoring

The City of Cold Bay will monitor the progress of mitigation actions on an annual basis. The City Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### D.8.3.1.3 Evaluating

The City of Cold Bay will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

Annual reviews should also consider whether new local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

#### D.8.3.1.4 Updating

The City of Cold Bay will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.6(c)(4)(i). The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Figure D-23 provides a visual of the HMP plan maintenance activities per year.

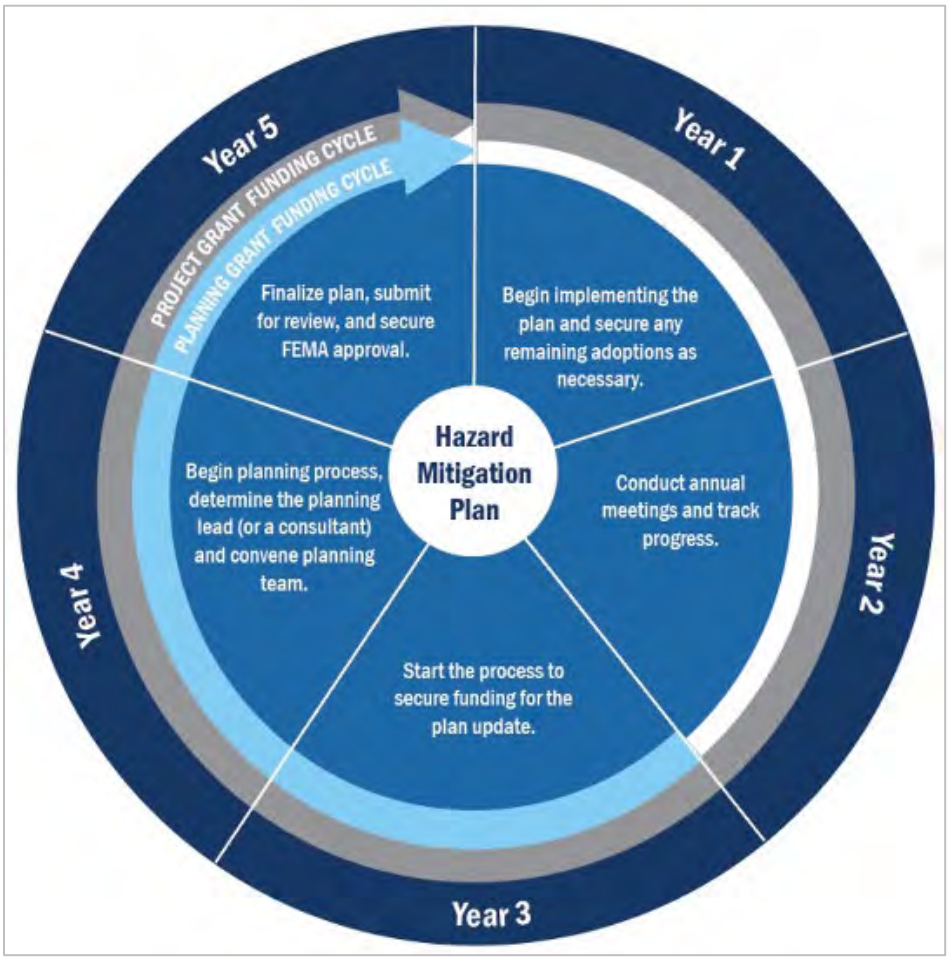



**Figure D-23- HMP Update Schedule**

## D.8.4 Plan Integration

The City of Cold Bay will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other planning and implementation processes, when appropriate.

The City will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the City's comprehensive and land use planning processes, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects.

As the plan is implemented, the City of Cold Bay will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## D.9 Plan Adoption

The City of Cold Bay City Council formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

[insert signed adoption resolution]

# E. City of False Pass



Photo Credit: Alaska Volcano Observatory

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# E.1 Planning Team

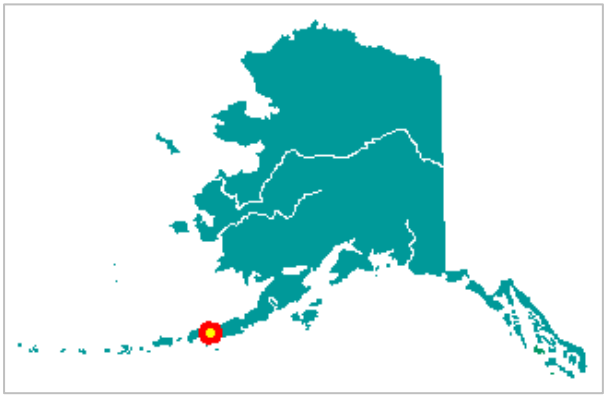
## E.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Nikki Hoblet** | City Administrator |
| **Billy Shelikoff** | Water Plant Operator |
| **Carleen Hoblet** | City Clerk |
| **Hazel Yatchmeneff** | Youth Representative |
| **Michael Franklin** | Superintendent |
| **Richard Downard** | City Mechanic |
| **Sharon Boyette** | Grant Writer |
| **Stephen Kennedy** | Volunteer Firefighter |
| **Tom Hoblet** | Vice Mayor |
| **Wes Shales** | Licensed Electrician |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

# E.2 Community Profile

## E.2.1 Location and Geography

False Pass is located on the eastern shore of Unimak Island on a strait connecting the Pacific Gulf of Alaska to the Bering Sea. It is 646 air miles southwest of Anchorage. It lies at approximately 54.8549º north latitude and -163.4119º west longitude. The area encompasses 26.8 square miles of land and 41.4 square miles of water.



## E.2.2 History

The name False Pass is derived from the fact that the Bering Sea side of the strait is extremely shallow and cannot accommodate large vessels. The area was originally settled by a homesteader in the early 1900s and grew when P.E. Harris established of a cannery in 1917. When the cannery was built, natives migrated from the now abandoned communities of Morzhovoi, Sanak Island, and Ikatan.

A post office was established in 1921. The cannery operated continuously, except from 1973 to 1976, when two hard winters depleted the fish resources. It was destroyed by fire in March 1981 and was not rebuilt, but it remained a supply base until 2003 when Peter Pan Seafoods announced its closure. The fishing fleet continues to use the site as a refuelling station. The city was incorporated in 1990. Fishing, fish processing, and subsistence activities are mainstays of the community lifestyle in False Pass.

## E.2.3 Population

The 2020 Decennial Census recorded a population of 397. In 2025, the DCRA estimated a population of 398. The 2024 American Community Survey Demographic and Housing Estimates recorded a total population of 151 with a margin of error of ± 273.

## E.2.4 Demographics

Though the population estimates vary between sources, the 2024 ACS reports a demographic composition of 6% White alone, 43.7% American Indian and Alaska Native, and 29.8% some other race, with Black or African American, Asian, and Native Hawaiian and Other Pacific Islander all reporting 0.0% of the population. White and other races make up 20.5% of the population. 55% of the population identifies as Hispanic or Latino.

## E.2.5 Economy

While the Peter Pan cannery and supply site may have closed, the fisheries industry still drives much of the economy in False Pass. Both the Bering Sea and Bristol Bay fleets use False Pass as a major refueling stop. From 2000 to 2002, Bering Pacific Seafoods operated as a local cooperative cannery, reopening for the 2008 salmon season. As of 2011, six local fishermen held nine commercial salmon fishing permits. The primary employers in the community are the City of False Pass, Isanotski Corporation, Native Village of False Pass, and Silver Bay Seafoods.

Subsistence harvesting also contributes to household food access and economic resilience in False Pass. Research involving False Pass describes subsistence as an interconnected social, cultural, and economic system involving harvesting, processing, sharing, exchange, access to commercial fisheries, equipment, labor, and social relationships (Reedy-Maschner and Maschner 2012).

### E.2.6 Land Use

As an incorporated 2nd class city, False Pass has the ability but not the requirement to enact and enforce planning, platting, and land use regulation. Title 7, Chapter 35 of the False Pass Municipal Code is reserved for these responsibilities; however, the City of False Pass has not enacted any municipal ordinances to establish these powers within the local government.

## E.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following jurisdictional-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **1999 Overall Economic Development Plan** | Provides long-term strategies for economic development and growth in the AEB and its communities | Used relevant information to develop the Community Profile |
| **2007 USACE Erosion Information Paper- False Pass** | Baseline erosion assessment of the community. | Used to describe historical erosion locations, rates, and impacts in the communities where reports were available. |
| **2010 & 2021 Aleutians East Borough MJHMP** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **2025 False Pass Water Intake Investigation Technical Memo** | Describes the findings of the engineers' site visit including the current (2025) site conditions of the False Pass Water Dam, and recommendations related to the structure | Used information in the Dam Failure hazard profile, suggested mitigation actions related dam failure |
| **2025 Tsunami Inundation Map of False Pass, Alaska** | Identify potential tsunami hazards for the community and model the extent of tsunami waves generated earthquake and landslide events. | Referenced data in Tsunami hazard profile/annex. Used inundation maps as the data source for potential losses due to tsunami event. |

Source: State of Alaska Community Plans Library, HDR 2025, Troshina, E.N., Salisbury, J.B., and Nicolsky, D.J., 2025

# E.4 Risk Assessment

## E.4.1 Hazards

The City of False Pass Planning Team identified the following natural hazards that may impact their geography/community.

- ✓ Hazard profiled for this jurisdiction in the MJHMP Update
- X Hazard not profiled for this jurisdiction in the MJHMP Update

- ✓ Changes in the Cryosphere- Sea Ice
- X Changes in the Cryosphere- Snow Avalanche
- ✓ Dam Failure
- ✓ Earthquake
- ✓ Flood
- ✓ Ground Failure/Landslide
- ✓ Invasive Species
- ✓ Sediment Deterioration and Land Destabilization
- ✓ Severe Weather
- ✓ Tsunami
- ✓ Volcano
- X Wildland Fire

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere- Sea Ice | 2- Possible | 2- Limited | While sea ice is less common in the Aleutian Islands than farther north in the Bering Sea, affected locations include exposed coastlines around False Pass. The Planning Team reported that sea ice runup has resulted in damage to the City Dock (Fuel Dock), pile, and navigation buoys. |
| Cryosphere – Snow Avalanche | Did not profile this hazard. | | |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485 mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and False Pass itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 2- Possible | 2- Limited | Sediment deterioration and land destabilization can occur throughout False Pass, with coastal and riverine land destabilization being the biggest concerns for the community.<br>Since False Pass is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline. |
| Flood | 3- Likely | 2- Limited | The Planning Team reports that low-lying waterfront areas in False Pass have experienced coastal flooding, storm surge, and high tides. Other flooding-prone areas include the runway and roadways. |
| Ground Failure/ Landslide | 2- Possible | 4- Catastrophic | False Pass is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | area as topsoil is pulled down slopes by gravity. Landslides have been reported by the Planning Team in False Pass. |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of False Pass is susceptible to severe weather events and impacts. The Planning Team reports experiencing high winds and extreme cold events. |
| Tsunami | 3- Likely | 4- Catastrophic | According to FEMA's National Risk Index, the tsunami risk for False Pass is Relatively Moderate. According to the State of Alaska DHS&EM, Akutan has local tsunami potential and a medium risk of distant tsunami potential.<br>Most critical facilities and infrastructure in False Pass are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community. |
| Volcano | 3- Highly Likely | 3- Critical | The entire geography of False Pass is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Shishaldin.<br>Volcanic ashfall is the primary volcanic hazard that may impact False Pass. |
| Wildland Fire | Did not profile this hazard. | | |
| Dam Failure | 2-Possible | 4- Catastrophic | There is one dam in False Pass, the False Pass Water Dam. There has not been a history of dam failure in False Pass. |
| Invasive Species | 3- Likely | 2 Limited | False Pass has had historical vessel traffic related to the fishing and shipping industry, which has contributed to the spread of invasive species in the region. The entire natural area surrounding False Pass is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. False Pass's location adjacent to a busy coastal port is the primary human-caused pathway in the spread of invasive species in the region. |

### E.4.1.1 Changes in the Cryosphere- Sea Ice

#### E.4.1.1.1 Location

While sea ice is less common in the Aleutian Islands than farther north in the Bering Sea, affected locations include exposed coastlines around False Pass.

#### E.4.1.1.2 History

The City of False Pass Planning Team noted that sea ice damaged the City Dock (Fuel Dock), pile, and navigation buoys in an March/April 2026. This was reported by the Planning Team as a "30-year event".

#### E.4.1.1.3 Extent (Magnitude and Severity)

Sea ice runup has resulted in damage to the City Dock (Fuel Dock), pile, and navigation buoys in March/April 2026. This was reported by the Planning Team as a "30-year event".

Based on the extent of past changing sea ice events and the criteria identified in Table 5 of the Base Plan, the extent of changing sea ice in False Pass is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### E.4.1.1.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The City of False Pass Planning Team reported concern about land destabilization and sediment transport in False Pass, which can be influenced by changing sea ice conditions. |
| Infrastructure | The City of False Pass Planning Team noted that sea ice damaged the City Dock (Fuel Dock), pile, and navigation buoys in an unknown year. This was reported by the Planning Team as a "30-year event". |
| People | The City of False Pass Planning Team did not report specific previous personal injury or death related to changing sea ice conditions. |
| Utilities | The City of False Pass Planning Team reported that riverine erosion is concerning for the electric utility and generator building. Changing sea ice conditions can impact rates of land destabilization and erosion due to its protective buffering effect during winter storms. |
| Transportation | The City of False Pass Planning team reports that flooding at the airport occurs annually due to storm surge, which can be exacerbated by changing sea ice conditions. |
| Economy | No specific previous impacts related to the local economy were reported by the City of False Pass Planning Team. |
| Subsistence Resources | While the City of False Pass Planning Team did not report specific previous impacts to subsistence resources, the Native Village of False Pass Planning Team noted that changing sea ice conditions impact access to subsistence resources. |

#### E.4.1.1.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that False Pass will experience an impactful sea ice change event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### E.4.1.1.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of sea ice hazards in Alaska. |
| Location | Future climate conditions are likely to influence the location of sea ice changes and associated hazards in Alaska by shifting the typical location of sea-ice loss northward and earlier in the season, resulting in longer periods of open water across the Bering Sea and reducing the likelihood that protective ice will form or persist near the Aleutians East Borough Planning Area. |
| Extent | Future climate conditions are likely to influence the extent of sea ice. The winter Bering Sea Ice cover continues to retreat as a long-term trend with year-to-year variability (State of Alaska DHS&EM 2023). |
| Impact | During the last several decades, Alaska has warmed twice as fast as the rest of the U.S. Sea ice and climate are intimately linked. An ice bench reduces wave development in the open ocean during winter months. Without an ice bench, waves can mechanically erode coastal beaches. Many villages are located along Alaska's coastline and are threatened by eroding shores.<br><br>Retreat of sea ice is anticipated to disrupt marine ecosystem, impact local communities where sea ice is important for subsistence or tourism, and contribute to increased storm surge, coastal flooding, and sediment deterioration and land destabilization (City of Cold Bay LHMP 2022). The presence of sea ice, which may continue to be highly variable from year to year despite a long-term downward trend, may cause delays to freight and damage to marine and coastal infrastructure. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of sea ice cover-related events, especially severe storms, in False Pass. Due to the loss of winter sea ice and other factors including increased temperatures and precipitation, Alaska as a whole is projected to see a threefold increase in severe storms (State of Alaska DHS&EM, 2023). |
| Population Patterns | Future climate conditions may influence population patterns as they relate to sea ice hazards, as increased frequency and adverse impacts from severe storms could lead people to relocate from vulnerable coastal areas, or from the community entirely. |
| Land Use Development | Future climate conditions may influence land use development as it relates to sea ice hazards, as an increase in severe storms without sea ice protection could lead to changes in the location of certain land use development activities - such as areas slated for marine infrastructure, residential construction or waste management - that are vulnerable to these severe storms. |
| Subsistence Resources | Future climate conditions are expected to influence subsistence resources as they relate to sea ice hazards. Low winter sea ice extents, which have been seen in the Bering Sea in the last decade, affect the marine ecosystem that supports subsistence resources that are critical to AEB communities' ways of life. Some species are expected to shift northward, such as Pacific Cod. Migration patterns and timing for species including salmon, marine mammals, and subsistence waterfowl are also observed and expected in the future. |

### E.4.1.2 Changes in the Cryosphere- Snow Avalanche

The City of False Pass Planning Team did not select this hazard to be profiled in the MJHMP Update.

While there are steep slopes surrounding the community, the Planning Team states that there is not enough snow accumulation for a significant avalanche to pose a threat to community.

Two landslides have been documented near False Pass, outside of City limits. These landslide events did not cause damage to any facilities or injuries/fatalities.

### E.4.1.3 Dam Failure

#### E.4.1.3.1 Location

There is one dam in False Pass, the False Pass Water Dam, which is owned by the City.

Figure E-1 shows the location of the dam in False Pass as well as the potential inundation area if the dam were to fail.

As formal dam failure inundation mapping has not been completed for this dam, dam failure hazard areas in the community were identified by buffering the 1-mile downstream route by 0.1 miles (528 feet). This methodology does not account for site-specific topography or hydrology and may over or underestimate dam failure hazard areas in the community.

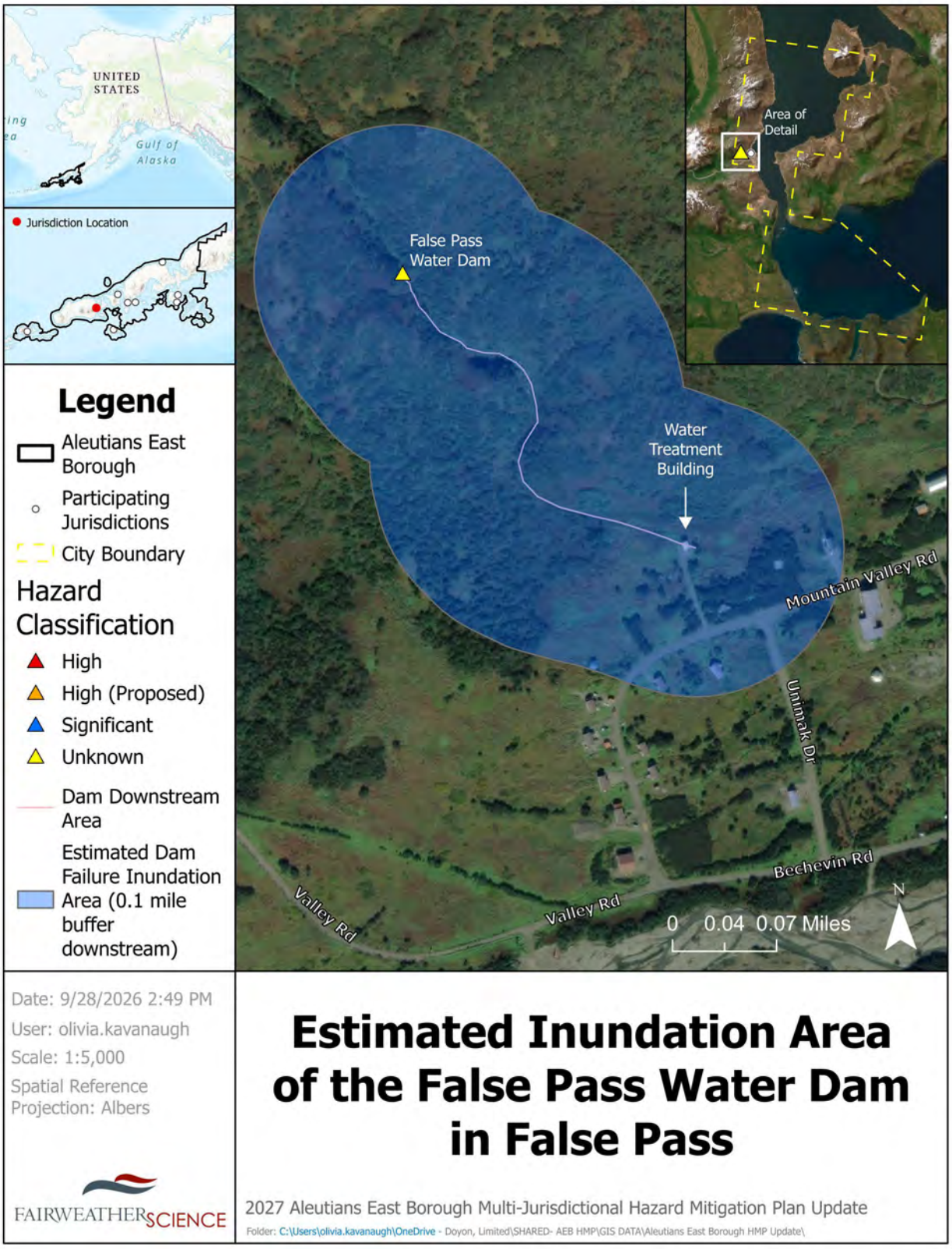



**Figure E-1- Estimated Inundation Area of the False Pass Water Dam**

| False Pass Water Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of False Pass |
| Year Built | Unknown |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | There is no information available about the inspection frequency of False Pass Water Dam. The last inspection was conducted on September 9, 2025. |
| Downstream Description | The dam outflow consists of a small, narrow outflow creek. |
| Downstream Area | The dam is located Northwest of False Pass, in low shrub habitat. The most recent inspection noted the access trail from the Water Pumphouse to the dam was engulfed by salmonberry bushes, cow parsnip, and alder trees. |
| Downstream Dams | There are no dams downstream of the False Pass Water Dam. |
| Downstream Bridges | There are no bridges downstream of False Pass Water Dam. |
| Reservoir Area | Unknown |
| Downstream Development | The Water Pumphouse is the first structure downstream of the dam, approximately 1 mile downstream. |
| General findings of the last inspection | While no definitive inspection rating was given to False Pass Water Dam during the 2025 inspection, all aspects of the dam were found to be in good condition with no observed defects or repair needs. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for False Pass Water Dam. |

Source: False Pass Planning Team, HDR 2025

#### E.4.1.3.2 History

There is no recorded history of dam failure in False Pass.

#### E.4.1.3.3 Extent (Magnitude and Severity)

Heavy rainfall, seismic activity, landslides, and flood events may affect the structural integrity of dams that would affect False Pass. Other natural hazards that are less predictable/ forecastable, like landslides or earthquakes, can also impact the structural integrity of dams and could lead to failure. Poor or infrequent maintenance, seismic activity, and severe weather can also weaken the integrity of a dam.

As formal dam failure inundation mapping has not been completed for the False Pass Water Dam, dam failure hazard areas in the community were identified by buffering the 1-mile downstream route by 0.1 miles (528 feet). This methodology does not account for site-specific topography or hydrology and may over or underestimate dam failure hazard areas in the community.

Based on this methodology, the only structure at risk of being impacted by a dam failure is the **Water Treatment Facility**, which is located about 1 mile downstream of the dam.

Based on the most recent condition assessments and the criteria identified in Table 5, the magnitude and severity of dam failure in False Pass is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks and more than 25% of property or critical infrastructure being severely damaged.

#### E.4.1.3.4 Impact

In False Pass, severe weather, flooding, landslide/ground failure events, or seismic activity could all bring enough rain and/or snowfall or topographic change to cause a dam failure. The age and conditions of the dam also pose a risk to the structural integrity of dams.

Dam failures result in impacts such as damage or destruction to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruption, and funding required to rehabilitate failed dams.

A dam failure will also cause secondary impacts to upstream and downstream flooding potential while the dam is not in operational order. Extreme precipitation events could impact drainages more severely than usual, due to space normally protected by the controlled release of a dam no longer afforded shielded from increased water flow.

A dam failure could generate a large and destructive flash flood downstream, depending on the size of the reservoir.

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | Due to a lack of historical dam failure events, there have not been any documented impacts to the geography or land in False Pass.<br>If a dam failure were to occur, the downstream area could experience rapid flooding, sediment deterioration, debris flows, and damage to infrastructure and property. Potential impacts would depend on the location, size, and condition of the dam, the volume of water released, and the characteristics of the downstream drainage area. |
| Infrastructure | Due to a lack of documented historical dam failure events, there have been no documented impacts to infrastructure within False Pass.<br>If a dam failure were to occur, the sudden release of water could damage or destroy downstream roads, bridges, culverts, utilities, water and wastewater systems, communications infrastructure, homes, and other critical facilities. Floodwater and debris could also block transportation routes and limit access to affected communities, potentially delaying emergency response and disrupting essential services.<br>Based on the methodology used to assess dam failure hazard areas in the community, the only structure at risk of being impacted by a dam failure is the Water Treatment Facility, which is located about 1 mile downstream of the dam. |
| People | Due to a lack of documented historical dam failure events, there have been no documented impacts to people within False Pass.<br>If a dam failure were to occur, the sudden release of water could create rapidly changing and potentially life-threatening flood conditions in downstream areas. Residents and people located near waterways or downstream areas could be exposed to flooding, debris, and dangerous water velocities. |
| Utilities | Due to a lack of documented historical dam failure events, there have been no documented impacts to utility systems within False Pass.<br>If a dam failure were to occur, flooding and debris could damage or disrupt electrical systems, water and wastewater facilities, fuel storage and distribution systems, communications infrastructure, and other essential utilities located downstream. |

| | Description of Previous/Potential Impacts |
|---|---|
| | Damage to utility systems could result in power outages, interruptions to water and wastewater services, loss of communications, and disruption of other essential services. |
| Transportation | Due to a lack of documented historical dam failure events, there have been no documented impacts to transportation infrastructure within False Pass.<br>If a dam failure were to occur, rapidly moving water, flooding, and debris could damage or wash out roads, bridges, culverts, and other transportation infrastructure located downstream. Flooding could also affect airport access, runways, taxiways, and associated facilities, potentially disrupting air service to and from affected communities. |
| Economy | Due to a lack of documented historical dam failure events, there have been no documented economic impacts from dam failure within False Pass.<br>If a dam failure were to occur, flooding and damage to infrastructure could disrupt local businesses, commercial activities, fisheries, transportation, and other economic activities. Damage to roads, airports, utilities, facilities, and equipment could result in costly repairs, business interruptions, supply delays, and temporary loss of income. |
| Subsistence Resources | Due to a lack of documented historical dam failure events, there have been no documented impacts from dam failure to subsistence areas or resources within False Pass.<br>If a dam failure were to occur, sudden flooding, sediment deterioration, and debris could affect streams, wetlands, shorelines, and other areas used for subsistence activities. Floodwater could damage or alter fish and wildlife habitat, affect water quality, and disrupt access to hunting, fishing, gathering, and other traditional subsistence areas. |

#### E.4.1.3.5 Probability of Future Events

According to the Alaska Dam Safety Program:

> *Dam owners conduct routine monitoring and inspection of dams within the state on the previously identified schedule, with priority placed on those dams which pose the greatest potential threat. However, to fully determine the probability of a future event, a full engineering inspection would need to be completed on each dam, something beyond the scope of this program. The majority of these more thorough inspections are conducted by an independent agency hired by the dam owner, FERC, or the USACE.*
>
> *Dams undergoing repair and/or reconstruction are required to be designed to pass at least the 1%-annual-chance rainfall event with one foot of freeboard. The most critical and hazardous dams are required to meet a spillway design standard much higher than passing the runoff from a 1%-annual-chance rainfall event. Although not all the dams have been shown to withstand the 1%-annual-chance rainfall event, most of the dams meet this standard due to original design requirements or recent spillway upgrades.*

The probability for dam failure reduces when the dam is properly maintained and receives a “Satisfactory” condition rating.

Based on the criteria listed in Table 5 of the Base Plan, and the most recent condition assessments (if available), it is **Possible** that False Pass will experience a dam failure event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year. Failure depends on loading conditions (existing condition, precipitation, seismic, deferred maintenance, etc.).

However, the State of Alaska Dam Safety Engineer warned of “condition creep”, where observational assessments of AEB dams have rated dams more poorly than their most recent available condition rating. If

False Pass Water Dam continues to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### E.4.1.3.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in False Pass. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in False Pass. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in False Pass. A potential outcome of changing climate in Alaska is an increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in False Pass. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in False Pass. Increased precipitation and frequency of severe weather events could contribute to more stress on the dam in False pass. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in False Pass as residents may relocate in and out of potential future inundation areas. Residents of False Pass may also relocate out of area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in False Pass. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in False Pass.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes.

### E.4.1.4 Earthquake

#### E.4.1.4.1 Location

The entire geography of False Pass is vulnerable to earthquakes, due to its location on the Alaska-Aleutian subduction zone.

According to the 2023 State of Alaska HMP, False Pass is located in an area with the potential of **Severe** perceived shaking from earthquakes (PGA 34-65). Perceived shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. These maps focus on the actual variations in shaking intensity across a region as felt by people and structures.

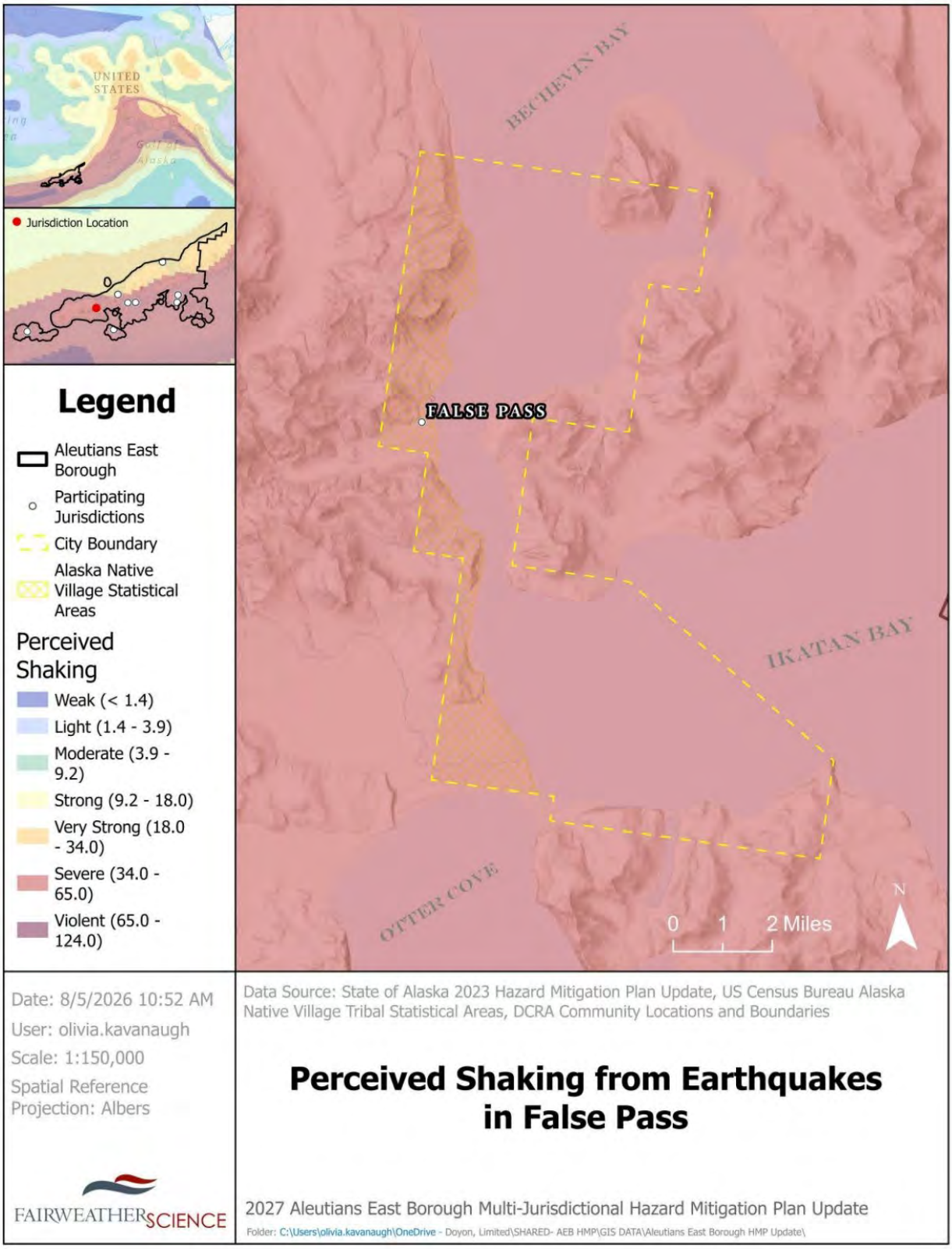



**Figure E-2- Perceived Shaking from Earthquakes in False Pass**

#### E.4.1.4.2 History

Thousands of earthquakes occur each year along the Aleutian chain. Strong shaking has occurred historically in False Pass and can damage infrastructure and trigger tsunamis.

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including False Pass can be found in Table 11 of the Base Plan.

#### E.4.1.4.3 Extent (Magnitude and Severity)

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. These range in magnitude from less than 3.0 to 6.0 and greater. Based off this data, the area surrounding False Pass experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Based on the extent of past earthquakes events and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in False Pass is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### E.4.1.4.4 Impact

| Description of Impacts | |
|---|---|
| Geography/Land | There have been no recorded earthquake impacts on the geography or land in False Pass. An earthquake has the potential to trigger landslides, open cracks in the earth, and change the shoreline. |
| Infrastructure | While shaking has been perceived in False Pass, no reports of damage to buildings have been reported. A large earthquake could crack foundations and roadways and flatten buildings and other structures in the case of extremely severe earthquakes. |
| People | No injuries or fatalities due to earthquakes have been reported in False Pass. Injuries or fatalities are possible due to falling debris. |
| Utilities | There are no recorded impacts on utility systems due to earthquakes in False Pass. Earthquakes can damage sewer and water lines, and down utility poles. |
| Transportation | There is no recorded transportation system impacts due to earthquakes in False Pass. In the future, earthquakes could damage roadways or airport runways, limit road and air travel, or cause a tsunami that could damage boat harbors and other water travel infrastructure. |
| Economy | There are no recorded economic impacts due to earthquakes in False Pass. |
| Subsistence Resources | There is no recorded earthquake caused impacts on subsistence resources in False Pass. |

#### E.4.1.4.5 Probability of Future Events

False Pass is located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing False Pass.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that False Pass will experience an earthquake of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### E.4.1.4.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | The characteristics and nature of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Location | The location of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Extent | The extent of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Impact | The impact of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Probability of Future Events | The probability of future earthquake events is not affected by changing climate conditions and is not expected to change on human timescales (Alaska DHS&EM 2023). |
| Population Patterns | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, population patterns in False Pass are not expected to be affected. |
| Land Use Development | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, land use development in False Pass is not expected to be affected. |
| Subsistence Resources | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, subsistence resources in False Pass are not expected to be affected. |

### E.4.1.5 Flood

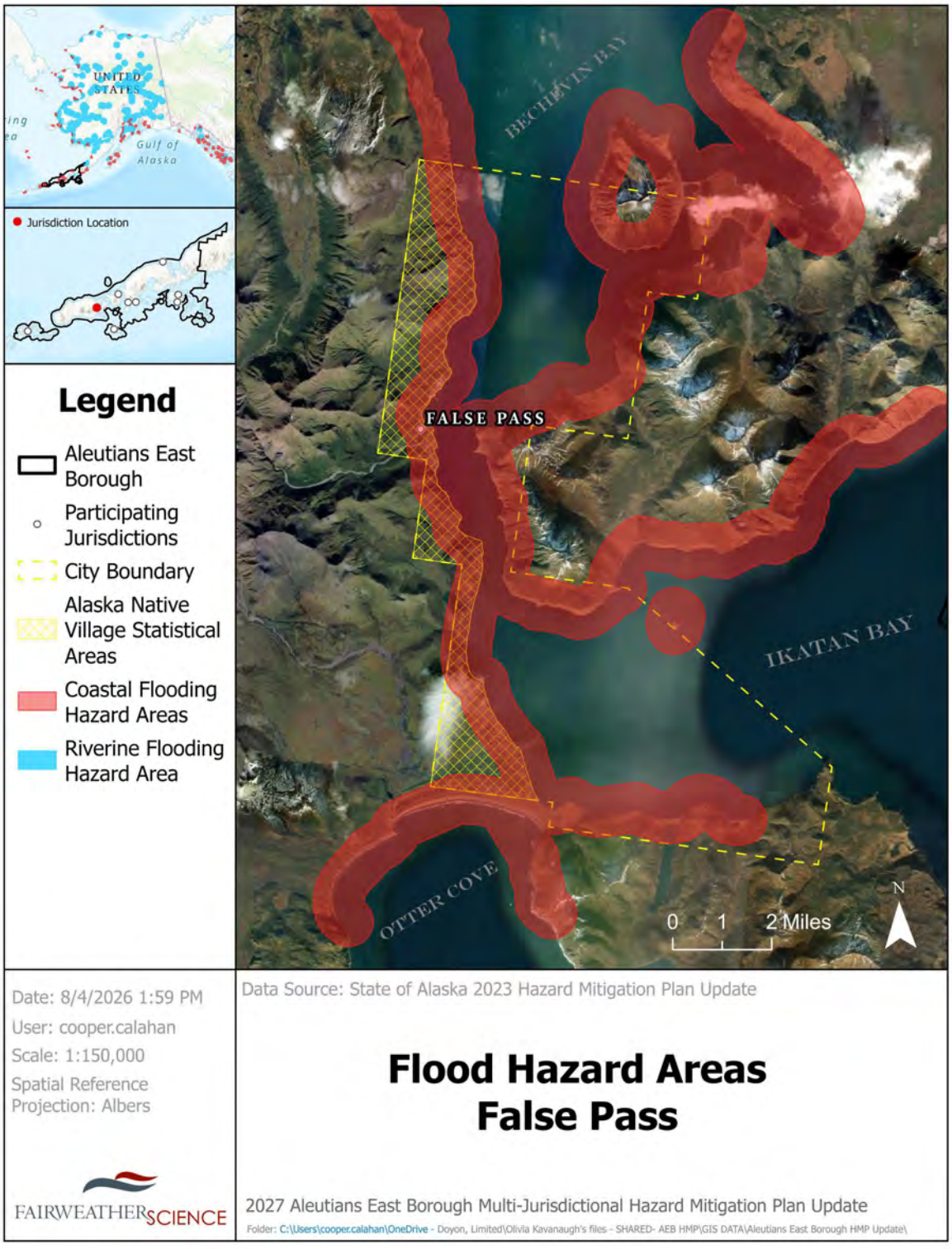
The City of False Pass Planning Team reports that they experience storm surge and rainfall run-off flooding events.

#### E.4.1.5.1 Location

According to the 2023 State HMP, False Pass is within the identified Coastal Flooding Hazard Area (Figure E-3). The State of Alaska identifies coastal flooding hazard areas of 0.5 miles from the coastline (DHS&EM 2023).

The City of False Pass Planning Team reports that they have experienced flooding at the south end of the airport which occurs annually. The severity of events at that location varies. The Planning Team also reports that riverine flooding impacts roadways in False Pass.

False Pass experiences flooding by the airport and the Mountain Valley subdivision.




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure E-3- False Pass Flood Hazard Areas**

#### E.4.1.5.2 History

In 2020, Road Top Creek flooded onto private land and washed-out foundations, the carpenter's shop with machinery, and warehouse on Peter Pan-owned land. In 2021, residents stated that water floods the road to the Mountain Valley subdivision a few times each year.

Floods in False Pass are a result of the 100-year discharge for the unnamed creek known locally as Round Top Creek. Past events have required the use of heavy equipment to divert flooding from the creek to an adjacent stream. The highest remembered flows in Round Top Creek occurred in the fall of 1963, December 1984, and November 1985. The flood of 1963 eroded through the middle of the newly constructed runway, but no reports of water entering the community were reported.

#### E.4.1.5.3 Extent (Magnitude and Severity)

Flooding has resulted in several inches of flood waters in False Pass.

The 2019 Denali Commission *Statewide Threat Assessment: Identification of Threats from Erosion, Flooding, and Thawing Permafrost in Remote Alaska Communities* identified False Pass and Nelson Lagoon as "threatened" communities based on the results of the USACE's Alaska Baseline Erosion Assessment, completed in 2009.

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest (number 63) has the lowest vulnerability (Denali Commission 2019).

Of these 187 communities, False Pass received a flood threat ranking of 56 out of 63 communities. While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking for flood threat. False Pass ranked 75 overall (out of 187 communities) for the combined erosion, flooding, and thawing permafrost threat. Some communities received the same ranking, indicating equal threat rankings.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding in False Pass is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### E.4.1.5.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The City of False Pass Planning Team did not report any specific previous geography/land impacts related to flooding in False Pass. |
| Infrastructure | In 2020, Road Top Creek flooded onto private land and washed-out foundations, the carpenter's shop with machinery, and warehouse on Peter Pan-owned land. In 2021, residents stated that water floods the road to the Mountain Valley subdivision a few times each year. |
| People | The City of False Pass Planning Team did not report any specific previous personal injury or death related to flooding in False Pass. |
| Utilities | The City of False Pass Planning Team did not report any specific utility outages or damage related to flooding in False Pass. |
| Transportation | In 2021, residents stated that water floods the road to the Mountain Valley subdivision a few times each year. The flood of 1963 eroded through the middle of the newly constructed runway, but no reports of water entering the community were reported. |
| Economy | No specific previous impacts related to the local economy were reported due to flooding by the City of False Pass Planning Team. |

| | Description of Impact |
|---|---|
| Subsistence Resources | The City of False Pass Planning Team did not report any specific previous subsistence resource impacts related to flooding in False Pass. |

#### E.4.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that False Pass will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### E.4.1.5.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in False Pass as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in False Pass is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in False Pass, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in False Pass. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021).<br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in False Pass, however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |

| Description of Future Conditions | |
|---|---|
| Population Patterns | It is possible that future flood events will cause changes in population patterns in False Pass as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### E.4.1.6 Ground Failure/Landslide

#### E.4.1.6.1 Location

False Pass is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity.

Many landslide paths coincide with avalanche paths, especially at higher elevations. Unmapped areas within the Borough remain to be studied for landslide hazards and will be included in future updates of this plan as resources become available to evaluate those areas for landslide hazards.

As landslide hazard areas are not well defined in the community and detailed terrain data, such as LiDAR, were not available, ArcGIS Pro basemaps, including satellite imagery, topographic maps, and terrain data, were used to identify mountainous areas, elevation, and observable slope characteristics.

Potential landslide hazard areas were manually delineated based on these features. Where available, photographs of the surrounding geography were also reviewed to confirm the presence of steep slopes and other terrain characteristics indicative of potential landslide hazard.

***This assessment is intended to identify potential areas of landslide hazard at a planning level. It is not a substitute for site-specific landslide hazard mapping, geotechnical investigations, or detailed evaluation of local topography, and site-specific conditions. Areas identified through this assessment should be considered preliminary and should be subject to further investigation where development or other activities may be exposed to landslide hazards.***

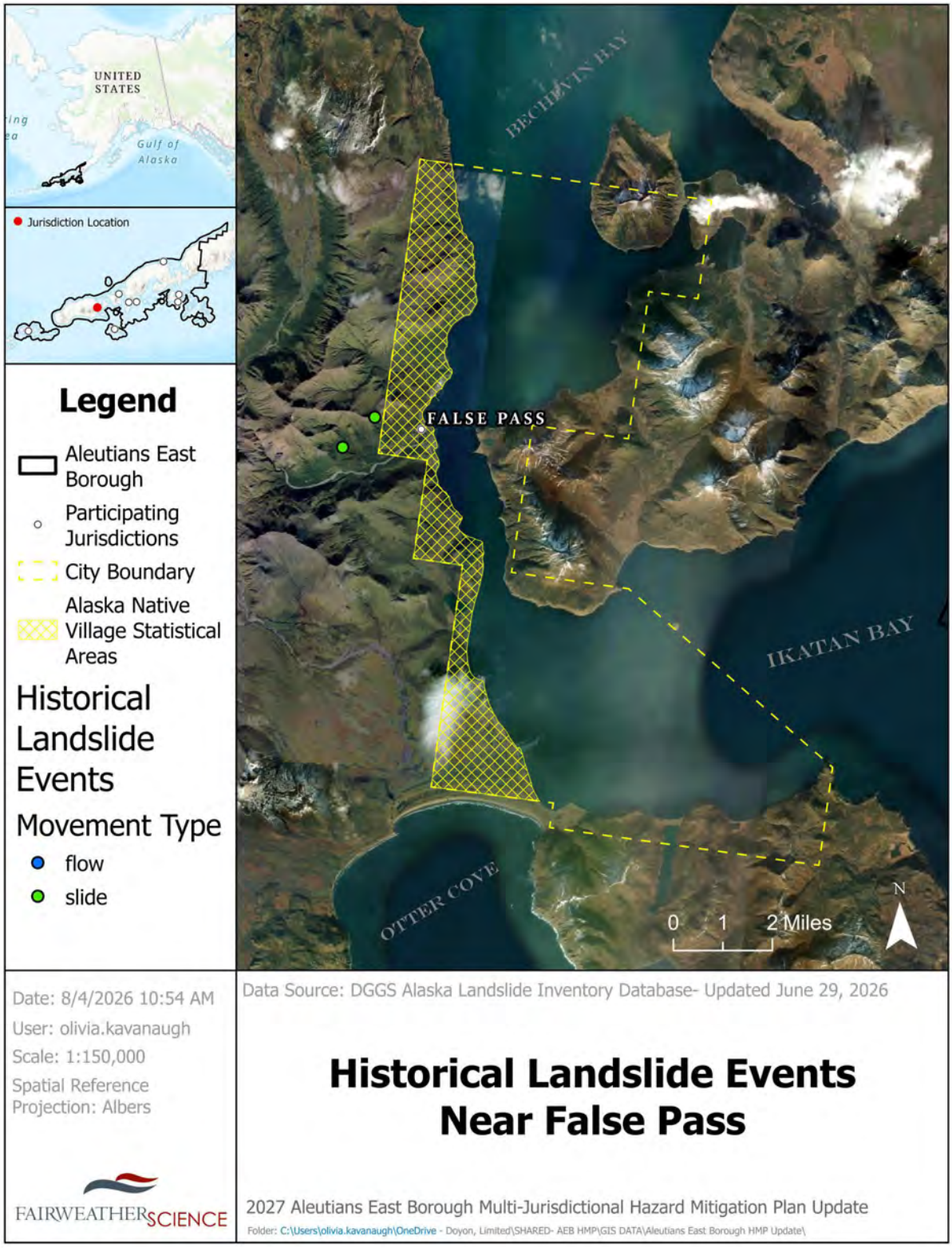



**Figure E-4 - Historic Landslide Events Near False Pass**

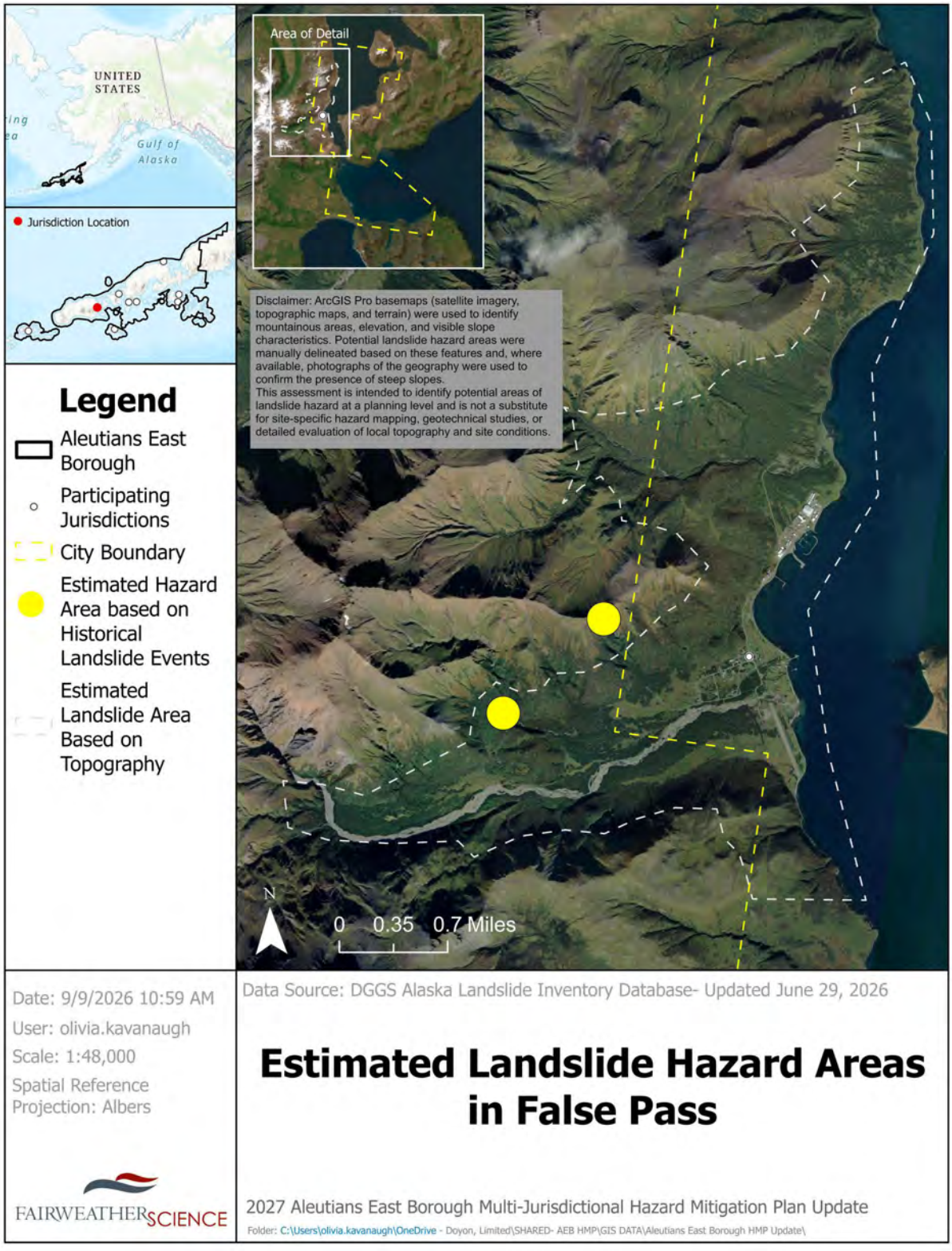



**Figure E-5- Estimated Landslide Hazard Areas in Akutan False Pass**

#### E.4.1.6.2 History

There have been two (2) recorded subaerial landslides near False Pass. The Alaska Landslide Inventory Database does not provide any additional information other than that they were classified as landslides and not debris flows.

The April 1st, 1946 earthquake near Unimak Island (approximately 42 m east of Akutan, 35 miles west of Cold Bay and 45 miles east of King Cove) created a tsunami wave that reached all the way to Antarctica. For years, speculation existed that the large tsunami was aided by a submarine landslide due to the disproportionate waves created by the earthquake. In 1996, the USGS GLORIA discovered numerous slope failures (historic submarine landslides) along the eastern Aleutian Shelf. An exceptionally large failure was found at the location of the now named Ugamak Slide (Fryer, Watts, Patson 2004). The Ugamak Slide consists of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

If the Ugamak Slide did indeed occur on April 1st, 1946, it is likely that much of the seismic motion, especially at longer periods, was from the slide itself. A tectonic shock – a shallow subduction earthquake – was probably the trigger but differentiating it from the rest of the motion may prove impossible. The evidence for a landslide source to the 1946 tsunami is substantial (Fryer, Watts, Patson 2004).

#### E.4.1.6.3 Extent (Magnitude and Severity)

Damage from ground failure or landslides ranges from minor with minimal repairs required to a massive economic impact with the possible destruction of critical community infrastructure and potential loss of human life.

Subaerial landslides on sloped terrain False Pass pose a threat to critical facilities or human life. Subaerial landslides near bodies of water also pose a threat to critical facilities or human life in False Pass as they may trigger a tsunami or seiche.

A landslide (both submarine and subaerial) has the ability to trigger a tsunami. Due to False Pass's location between the Bering Sea and the Pacific Ocean, and exposure to the open ocean, a submarine landslide-induced tsunami affecting the Planning Area in the future is a possibility. In the past, a submarine landslide created secondary hazards (tsunamis), that have impacted False Pass.

Based on the Alaska Landslide Inventory Database, it can be estimated that the historical landslides recorded in False Pass range in width of less than 100 feet to over 500 feet.

The largest discovered underwater landslide deposit in the Aleutians East Borough is the Ugamak Submarine Slide. The Ugamak Submarine Slide consisted of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

Based on the extent of past landslide events and the criteria identified in Table 5 of the Base Plan, the extent of landslides in False Pass is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### E.4.1.6.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | Two recorded landslides have impacted near the jurisdiction; however, they were not near any critical facilities. Future landslides could damage steep hillsides, making them more prone to land destabilization, avalanches, and further landslides. |
| Infrastructure | The City of False Pass Planning Team did not report specific previous impacts to infrastructure. Landslides can move structures off their foundation, damage walls and roofs, and cover or damage roadways and airport runways. |
| People | There have been no recorded injuries or fatalities due to landslides in False Pass. Landslides can injure or kill people due to debris and soil flowing or burying people. |

| Description of Impacts | |
|---|---|
| Utilities | There have been no recorded landslide impacts on utilities in False Pass. Landslides could damage sewer, water, and utility lines by moving earth downhill. |
| Transportation | There have been no recorded landslide impacts on transportation systems in False Pass. Road and air travel could be halted or delayed due to landslides damaging or covering the infrastructure. A submarine landslide could create a tsunami or seiche that damages boat harbors or other marine infrastructure, limiting water travel. |
| Economy | There have been no economic impacts due to landslides recorded in False Pass. |
| Subsistence Resources | There have been no recorded landslide impacts to subsistence resources in False Pass. |

#### E.4.1.6.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that False Pass will experience a landslide event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### E.4.1.6.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of landslides in False Pass in the future. |
| Location | It is possible that future climate conditions will influence the location of future landslides in False Pass. Landslide probability is location specific, and numerous variables must be considered. It is common for debris flows to recur in the same channel or to shift slightly. Other types of landslides may reoccur in the same place or the area directly adjacent to a previous landslide. False Pass is located in a highly seismic area, which can trigger landslides at any time, and create areas prone to landslides that did not used to be.<br>Ground failures related to more frequent severe weather events, an increase in atmospheric rivers, and potential droughts are expected to appear in locations that were previously frozen and are now thawing. This includes areas that are immediately adjacent to recently thawed ground and where overlying vegetation has been removed. However, landslides also occur in areas with no prior known instabilities due to changing conditions such as increased rainfall, strong earthquake shaking, and human activities (DHS&EM 2023). |
| Extent (Magnitude and Severity) | It is likely that future climate conditions will influence the magnitude of future landslides in False Pass. Landslides are expected to increase in magnitude with increased areas of effect as severe weather events increase in frequency (IPCC 2019).<br>Future climate conditions are expected to increase landslide frequency of all intensities, and as people develop across the landscape, including into hazardous areas, there will likely be an increase in more significant outcomes in the future (DHS&EM 2023). |
| Impact | It is likely that future climate conditions will influence the impact of future landslides in False Pass. Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from an increase in atmospheric rivers, severe weather events, and glacial decline (IPCC 2019), which could increase future ground failure events and resultant impacts. |

| Description of Future Conditions | |
|---|---|
| Probability of Future Events | It is likely future climate conditions will influence the probability of future landslides in False Pass. Although the probability of ground failure is location-specific, it is likely, and increasing, due to a changing climate. Severe weather events such as precipitation and wind are a direct result of atmospheric warming. Atmospheric rivers are becoming increasingly common and increase the intensity and duration of precipitation events at regional and local scales. Landslide events are directly related to high intensity precipitation events, and those are likely to become more common over greater geographic regions of Alaska (DHS&EM 2023). |
| Population Patterns | It is possible future climate conditions will influence population patterns in False Pass. Since 2020, the population has remained stable, with the population fluctuating greatly during seasonal fishing season (US Census 2026). This may eventually mean more of the resident population living in landslide hazard areas, however an increased growing season due to future climate conditions could lengthen the tourist season. An increase in tourists throughout the year could possibly increase the number of people that are at risk of landslide hazards at any given moment. |
| Land Use Development | It is possible future climate conditions will influence future land use development in False Pass. Limiting development and relocating existing development outside of landslide hazard areas would change the development in these areas. A landslide warning system could require infrastructure development, and more development outside of the landslide zones could increase land use to accommodate displaced residents. It is also possible that land developed in the future, or that has already been developed, may eventually become prone to landslide hazards. |
| Subsistence Resources | It is possible that future climate conditions will result in landslides impacting subsistence resources. Landslides could wipe out land access to certain parts of coastline, berry gathering locations, or trails leading to hunting or fishing grounds. |

### E.4.1.7 Invasive Species

#### E.4.1.7.1 Location

The entire natural area surrounding False Pass is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. False Pass's location adjacent to a busy coastal port is the primary human-caused pathway in the spread of invasive species in the community. While the community has had no historic invasive rat populations, its maritime connection to Akutan increases the risk of a future infestation.

In False Pass, one species of an invasive terrestrial plant has been documented, including:

- Creeping Buttercup

Figure E-6 depicts the locations of documented invasive terrestrial plant species in False Pass, as reported by community members in the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database.

Note that the "downtown" area may have more documented invasive species sightings than other areas of the community due to its higher population density and greater likelihood of observation and reporting. Therefore, the number of reported sightings may not necessarily reflect the actual distribution or abundance of invasive species across the community.

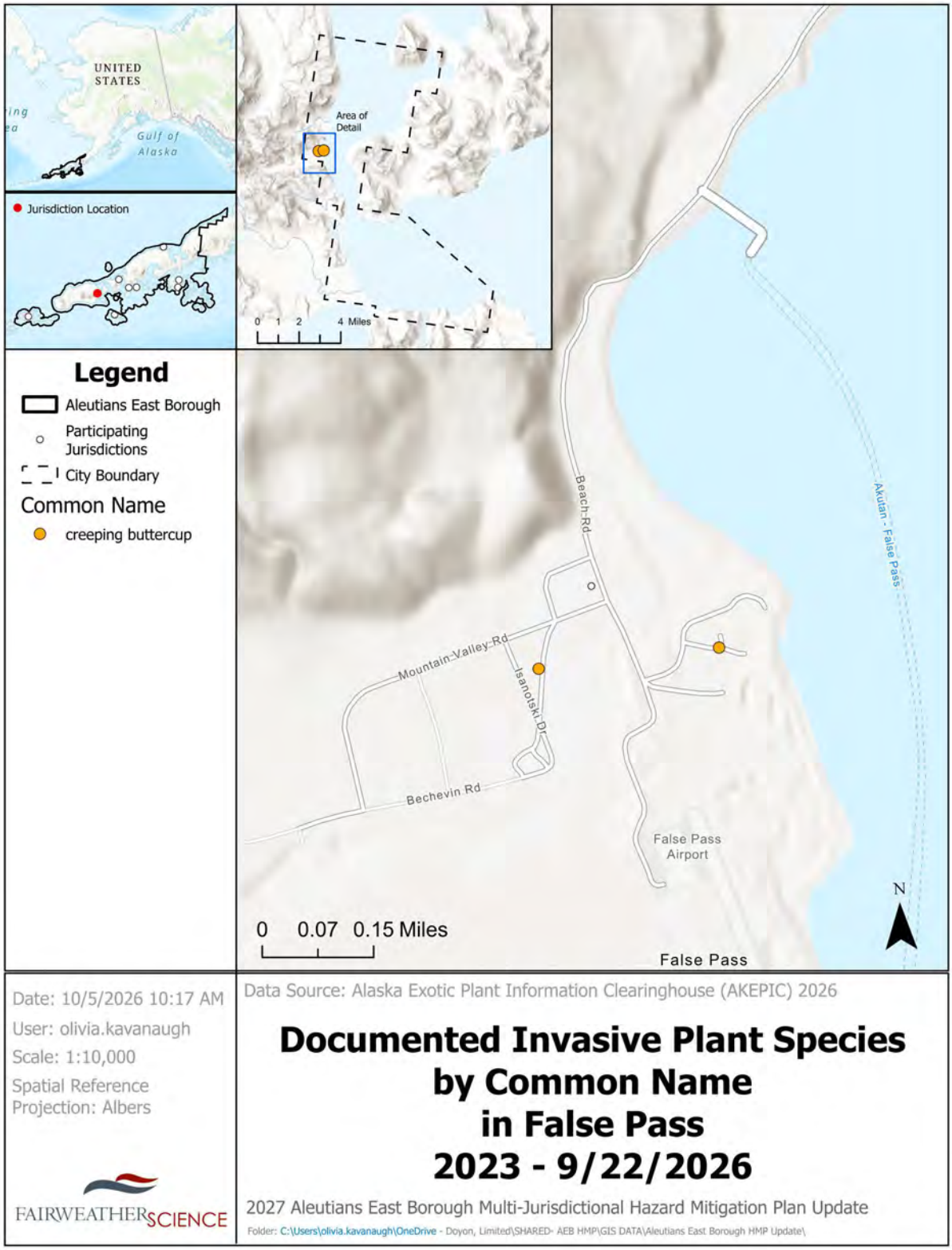



**Figure E-6- Documented Invasive Plant Species by Common Name in False Pass**

#### E.4.1.7.2 History

False Pass has had historical vessel traffic related to the fishing and shipping industry, which has contributed to the spread of invasive species in the region. While there have been no historical occurrences of invasive rats or invasive aquatic animals in the community, False Pass has had a history with the spread of invasive terrestrial plants. Currently, there are very few documented occurrences of non-native plants in False Pass, likely due to limited survey efforts in the community. This lack of data doesn't necessarily indicate the prevalence of non-native plants in False Pass.

#### E.4.1.7.3 Extent (Magnitude and Severity)

Although damages to the lands surrounding False Pass from invasive species has been limited, one highly invasive non-native plant has been documented in the community.

The highly invasive Creeping Buttercup, which has an invasiveness ranking of 72 has reportedly infested a total of 11 acres of land in False Pass.

Table E-1 displays the non-native plant occurrences that have occurred within False Pass.

**Table E-1- Non-Native Plants in False Pass**

| Invasive Plant Species | Total Infested Area (acres) | Invasiveness Ranking (0-100) |
|---|---|---|
| **Creeping Buttercup** | 11 | 72 |

**While invasive species are a concern for many communities, at this time, the presence of these species is not impacting critical facilities.**

Based on previous occurrences and the criteria identified in Table 5, the magnitude and severity to False Pass from invasive species are considered **Limited**.

#### E.4.1.7.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of invasive species on the land surrounding False Pass has been localized non-native plant infestations, which can outcompete native plants and wildlife. |
| Infrastructure | There is limited evidence that invasive species have directly impacted infrastructure in False Pass. |
| People | While invasive species can affect resources that people depend on, False Pass has no history of invasive species directly affecting the residents of the community. |
| Utilities | There have been no documented cases of invasive species causing utility disruptions in False Pass. |
| Transportation | Transportation is identified as a potential pathway for invasive species to spread throughout False Pass. Due to the nature of invasive species in the community, there is little evidence to show that these species cause direct damage to transportation infrastructure in False Pass. |
| Economy | There have been no reports of an invasive species infestation resulting in significant economic impacts in False Pass. |
| Subsistence Resources | Invasive species pose a potential threat to subsistence resources in False Pass, primarily related to the threat of non-native plants outcompeting native plants that residents rely on for subsistence activities. |

#### E.4.1.7.5 Probability of Future Events

Based on previous occurrences, and the criteria identified in Table 6 of the Base Plan, it is **Likely** that False Pass will experience an invasive species event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### E.4.1.7.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is possible future climate conditions will influence the nature of invasive species in False Pass. Warmer temperatures and longer growing seasons may allow some invasive species to become established in areas where they don't historically occur. |
| Location | It is likely future climate conditions will influence the location of invasive species in False Pass. Changes in temperature and precipitation patterns may allow invasive species to expand into new terrestrial and marine areas of Akutan. |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of invasive species in False Pass. Future changes may create favorable conditions for certain invasive species, allowing populations to spread at a rapid rate. |
| Impact | It is likely future climate conditions will influence the impacts of invasive species in False Pass. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of invasive species in False Pass. As environmental conditions change, areas that were previously unsuitable for certain invasive species may become more favorable for establishment and spread, which increases the probability of future events in False Pass. |
| Population Patterns | It is possible future climate conditions will influence population patterns in False Pass. Changes in the distribution and abundance of invasive species may alter the availability of food and habitat relied upon by wildlife and residents of False Pass. |
| Land Use Development | It is unlikely that future climate conditions will influence future land use development in False Pass. |
| Subsistence Resources | It is likely future climate conditions will influence subsistence resources in False Pass. Changes in ocean conditions, weather patterns, and species distribution may affect the availability and accessibility of important subsistence resources. The introduction or expansion of invasive species could further impact native species that support subsistence activities in False Pass. |

### E.4.1.8 Sediment Deterioration and Land Destabilization

#### E.4.1.8.1 Location

Sediment deterioration and land destabilization can occur throughout False Pass, with coastal and riverine land destabilization being the biggest concerns for the community.

Since False Pass is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.

Riverine sediment deterioration and land destabilization is identified as another significant concern for the community, with multiple sections of riverbank near False Pass experiencing long-term destabilization.

#### E.4.1.8.2 History

The history of coastal sediment deterioration and land destabilization in False Pass varies by location due to the localized nature of storms in the community. The majority of recorded impacts from sediment deterioration and land destabilization in False Pass is related to riverine land destabilization. Since 2000, the south side of the riverbank within False Pass has deteriorated significantly, with the destabilization within 100 feet of the airport bridge. Sediment deterioration and land destabilization has also had a history of impacting the area surrounding the FAA pad in False Pass, with the destabilization area creeping closer to the pad on an annual basis.

#### E.4.1.8.3 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of sediment deterioration and land destabilization vary throughout select communities. In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk. False Pass was categorized in erosion group 2, which places it at a moderate risk of sediment deterioration and land destabilization according to the study.

According to the City of False Pass Planning Team, over the last 25 years, the south side of the riverbank has lost ~100 feet and the shoreline is within 100 feet of the bridge. To the north, the riverbank has lost about 10 to 20 feet. There is noticeable sediment deterioration within 50 feet of the FAA Pad, which is also causing concern for the electric utility generator building.

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the extent of sediment deterioration and land destabilization in False Pass is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### E.4.1.8.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding False Pass has been damages to shoreline and beaches, particularly along areas exposed to waves and storms. Sediment deterioration is leading to shoreline loss of 10-100 feet in False Pass. |
| Infrastructure | While infrastructure has not been impacted from sediment deterioration and land destabilization in False Pass, the City of False Pass Planning Team is concerned about shoreline loss near the FAA Pad potentially affecting the electric utility generator building, as well as encroaching shoreline loss near the bridge. |

| Description of Impact | |
|---|---|
| People | Sediment deterioration and land destabilization have not resulted in injuries or fatalities to the residents of False Pass. |
| Utilities | While utilities have not been impacted from sediment deterioration and land destabilization in False Pass, the City of False Pass Planning Team is concerned about shoreline loss near the FAA Pad potentially affecting the electric utility generator building. |
| Transportation | While transportation has not been impacted from sediment deterioration and land destabilization in False Pass, the City of False Pass Planning Team states that over the last 25 years, the south side of riverbank has lost ~100 feet and the shoreline is within 100 feet of the bridge, which could cause future transportation disruptions in the community. |
| Economy | There are a substantial number of roads and trails in False Pass that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities. |
| Subsistence Resources | Sediment deterioration and land destabilization has not impacted subsistence resources in False Pass. |

#### E.4.1.8.5 Probability of Future Events

The low-lying geography influences the likelihood of continued sediment deterioration and land destabilization in False Pass.

Based on the criteria listed in Table 6 (Base Plan) and the most recent condition assessments (if available), it is **Possible** that False Pass will experience a sediment deterioration and land destabilization event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year. Failure depends on loading conditions (existing condition, precipitation, seismic, deferred maintenance, etc.).

#### E.4.1.8.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in False Pass. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in False Pass. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal land destabilization in False Pass (AK DGGS 2026). |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in False Pass. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in False Pass. Projected increases in precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |

| Description of Future Conditions | |
|---|---|
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in False Pass. Although the probability for land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |
| Population Patterns | It is possible future climate conditions will influence population patterns in False Pass. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of False Pass entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in False Pass. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in False Pass. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

### E.4.1.9 Severe Weather

The Planning Team reports that False Pass experiences high winds and extreme cold events.

#### E.4.1.9.1 Location

Severe weather events can impact the entirety of False Pass.

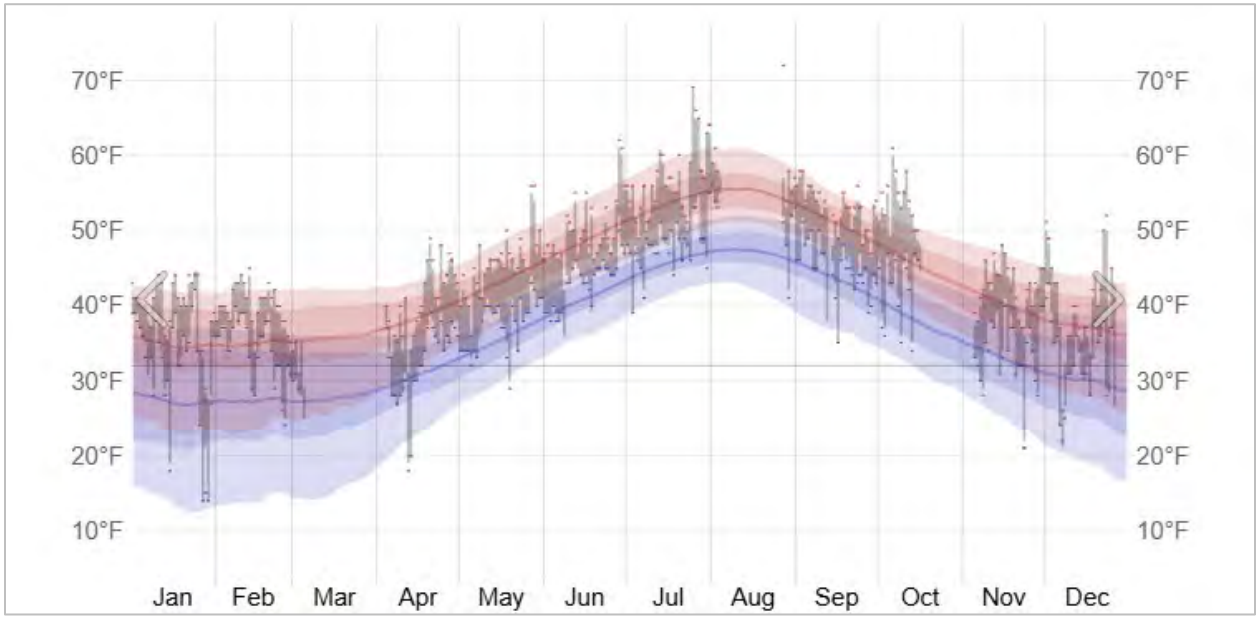
#### E.4.1.9.2 History

On April 7, 2011, a destructive storm caused extensive damage in False Pass. 100mph winds collapsed buildings and blew part of a roof off a home. According to False Pass City Clerk Chris Emrich, the public safety building roof was partially blown off, and the medical clinic windows were blown out. The doors to the ambulance bay were halfway ripped off. Siding was torn off the village public safety officer's house. The wind flipped a 4-wheel vehicle over and pushed it about 30 feet down the road. Windows were blown out in several homes. Several buildings completely collapsed, including older vacant houses (AEB 2011).

Gale warnings and small craft advisories are not uncommon in False Pass. On October 21, 2024, a powerful storm struck Alaska's west coast. On November 1, 2024, a gale warning and small craft advisory were still in effect for the Bering Sea at False Pass (Alaska DOT 2024).

#### E.4.1.9.3 Extent (Magnitude and Severity)

The figure below shows the daily range of reported temperatures (gray bars) and 24-hour highs (red ticks) and lows (blue ticks). The daily average high is indicated by the red line, and the low is indicated by the blue line.




Source: Weather Spark 2026

**Figure E-7- False Pass Airport Temperature History, 2024**

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather in False Pass considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### E.4.1.9.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team did not report specific previous geography/land impacts as a result of severe weather events in False Pass. |

| | Description of Impact |
|---|---|
| Infrastructure | The Planning Team reports that tin has flows off roofs. They report that an old house was torn apart due to high winds.<br><br>On April 7, 2011, a destructive storm caused extensive damage in False Pass. 100mph winds collapsed buildings and blew part of a roof off a home. According to False Pass City Clerk Chris Emrich, the public safety building roof was partially blown off, and the medical clinic windows were blown out. The doors to the ambulance bay were halfway ripped off. Siding was torn off the village public safety officer's house. The wind flipped a 4-wheel vehicle over and pushed it about 30 feet down the road. Windows were blown out in several homes. Several buildings completely collapsed, including older vacant houses. |
| People | No specific personal injury or death was reported due to severe weather in False Pass. |
| Utilities | The Planning Team reports that it was very cold for three months in the winter of 2025-2026. Residents had to thaw out fuel in the power plant. |
| Transportation | High winds and other severe weather can restrict air and marine travel, leading to travel and transit delays as well as isolation. |
| Economy | No specific previous impacts related to the local economy were reported by the City of False Pass Planning Team. |
| Subsistence Resources | The Planning Team did not report specific previous subsistence resource impacts because of severe weather events in False Pass. |

#### E.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that False Pass will experience a severe weather event (dense fog, extreme cold, heavy rain, heavy snow, or high winds), within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### E.4.1.9.6 Future Climate Conditions

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in False Pass. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in False Pass. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in False Pass. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in False Pass. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in False Pass. | It is unlikely that future climate conditions will influence the nature of future high wind events in False Pass. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in False Pass. | It is possible that future climate conditions will influence the location of future drought/water supply events in False Pass. | It is unlikely that future climate conditions will influence the location of future extreme cold events in False Pass. | It is unlikely that future climate conditions will influence the location of future heavy rain events in False Pass. | It is unlikely that future climate conditions will influence the location of future heavy snow events in False Pass. | It is unlikely that future climate conditions will influence the location of future high wind events in False Pass. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in False Pass could increase (UAF/SNAP 2025). | In False Pass, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Spring temperatures are projected to increase the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026).<br>Climate changes within Alaska are likely to result increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In False Pass, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Spring temperatures are projected to increase the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in False Pass. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP).<br>Extreme precipitation events have occurred throughout Alaska with increasing frequency.<br>In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In False Pass, climate models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>In False Pass experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months.<br>Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). |
| Impact | Projected increases in precipitation and associated moisture availability in False Pass could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026).<br>Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in False Pass are projected to increase, with estimated spring temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities in the Aleutians East Borough (Alaska DHS&EM 2023). | While overall temperature trends in False Pass are projected to increase, with estimated annual temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In False Pass, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026).<br>As precipitation increases, impacts associated with heavy rainfall (localized flooding, landslide potential, roadway washouts, etc.) will increase. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | levels.<br>The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in False Pass by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in False Pass are projected to increase; with estimated winter temperature increases of approximately +7°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In False Pass, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+25%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in False Pass are projected to increase, with estimated spring temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In False Pass, spring is likely to have more precipitation (UAF/SNAP 2026).<br>Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in False Pass may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in False Pass have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in False Pass. | Future conditions of drought are not anticipated to significantly affect population patterns in False Pass. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in False Pass. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | It is not likely that future conditions influencing heavy rain will impact changes in False Pass population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in False Pass population patterns. | It is not likely that future conditions influencing high winds will impact changes in False Pass population patterns. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in False Pass. | Future conditions of drought are not anticipated to substantially affect future land use development in False Pass. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in False Pass, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in False Pass population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in False Pass land use development. | It is not likely that future conditions of high winds will impact changes in False Pass population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in False Pass. | Future conditions of drought may affect subsistence resources in False Pass, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | Future conditions of extreme cold may affect subsistence resources in False Pass, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | It is possible that future conditions of heavy rain will impact changes in False Pass land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above In False Pass, leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to development of landslide | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, | It is not likely that future conditions of high winds will impact changes in False Pass land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | monitoring equipment and/or landslide barriers/diversion structures. | thermal stress, and nutrient availability for subsistence species. | |

**Projected Conditions for False Pass (Isanaẋ)**

In False Pass (Isanaẋ), average annual temperatures may increase by about 9°F by the end of the century.

Spring temperatures are projected to increase the most (+9°F).

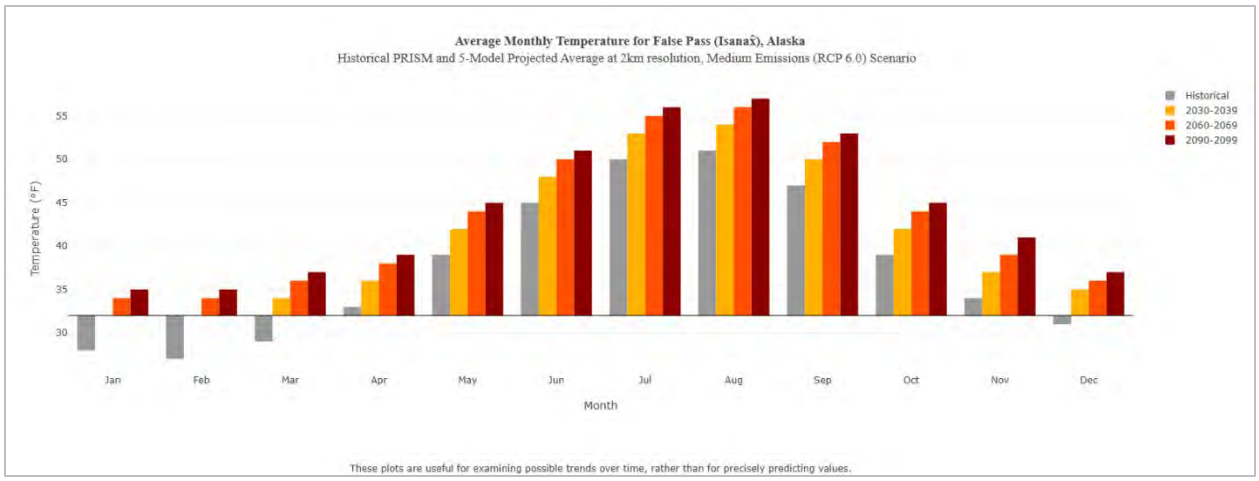
Winter may transition from below freezing to above freezing in the future.

Models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+24%).

In the past, this area had very low flammability. Future flammability may be about the same.

*Source: UAF/SNAP- Northern Climate Reports*

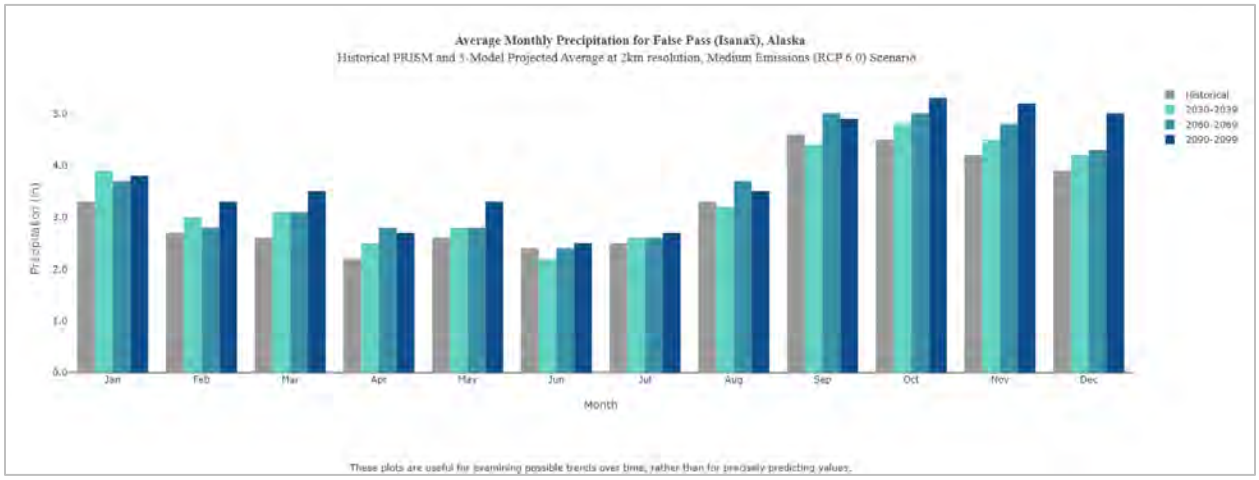
Figure E-8 models historical and future average monthly temperatures in False Pass from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure E-8- Historical and Future Projected Average Monthly Temperature in False Pass (1980-2099)**

Figure E-9 models historical and future average monthly precipitation in Nelson Lagoon from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure E-9- Historical and Future Projected Average Monthly Precipitation in False Pass (1980-2099)**

### E.4.1.10 Tsunami

#### E.4.1.10.1 Location

Most critical facilities and infrastructure in False Pass are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community (Figure E-10).

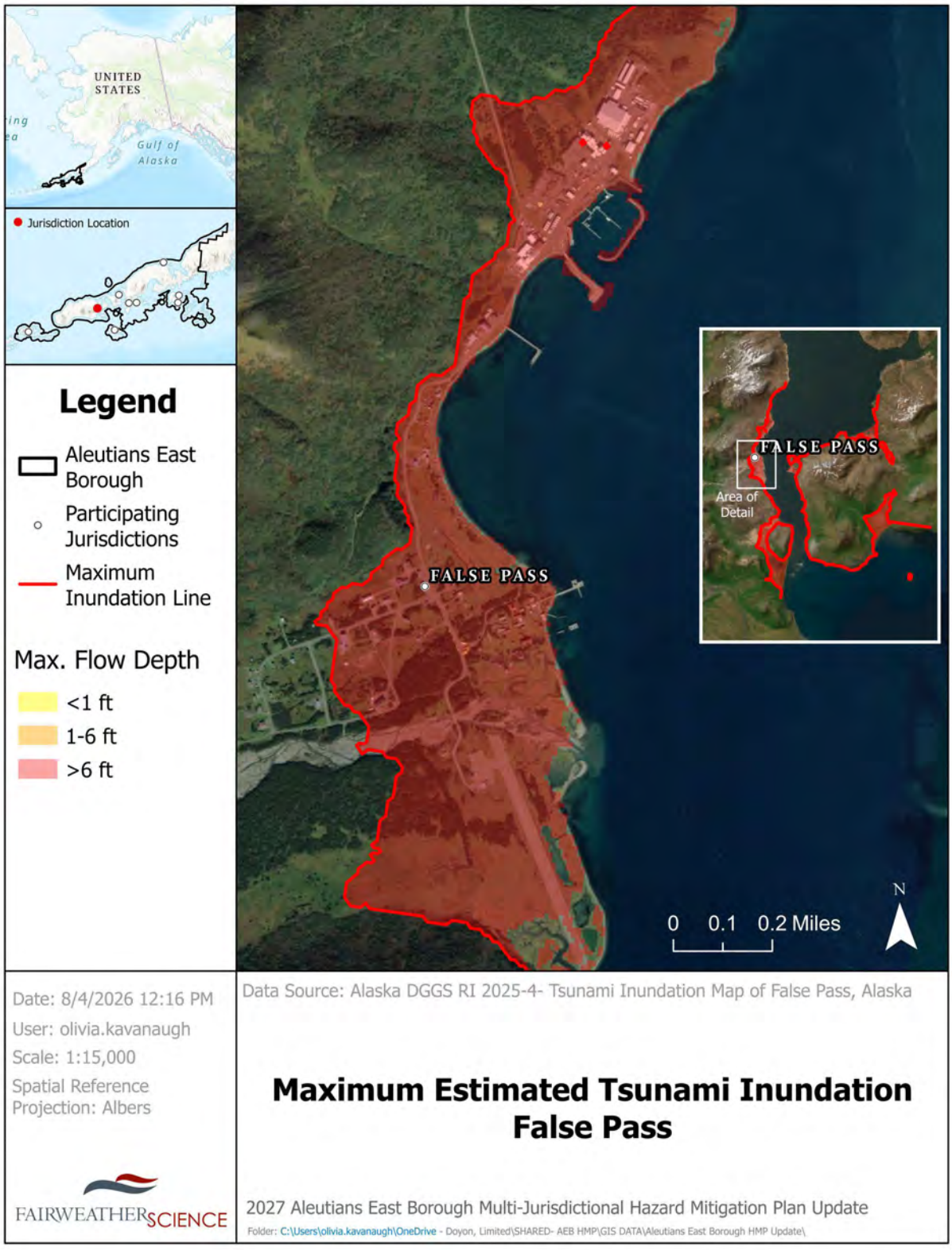



**Figure E-10- Potential Tsunami Inundation in False Pass**

### E.4.1.10.2 History

False Pass is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust.

Since 1788, there have been 3 documented tsunami runup events in False Pass (Table E-2 and Figure E-12); however, none of these runup events were recorded near the population center. All events were recorded near the southern edge of the City boundary, not near any infrastructure or residential population.

**Table E-2- Tsunami Runups Events in False Pass (1788 - August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 12 | 1946-04-01 | IKATAN (AKUTAN), AK | EQ + LS | 8.6 | Unknown |
| 20 | 1946-04-01 | IKATAN, UNIMAK IS, AK | EQ + LS | 8.6 | 21.98 |
| 21 | 1946-04-01 | IKATAN, UNIMAK IS, AK | EQ + LS | 8.6 | 24.93 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

**April 1946 Aleutian Islands Earthquake and Tsunami**

The 1946 Aleutian Islands earthquake and tsunami struck on April 1, 1946, triggered by a powerful magnitude 8.6 undersea earthquake in the Aleutian Trench off Unimak Island, Alaska, which sent devastating Pacific-wide waves that resulted in a handful of deaths in Alaska and 159 deaths in Hilo, Hawaii.

The tsunami completely obliterated the steel-reinforced concrete Scotch Cap Lighthouse on Unimak Island (in the Aleutians East Borough, approximately 60 miles east of Akutan) and killed all five Coast Guard keepers (National Coast Guard Museum 2024).

Tsunami run-up of nearly 25 feet was recorded in False Pass, near the southern edge of the City boundary, not near any infrastructure or residential population.



Source: National Coast Guard Museum 2024

**Figure E-11- Scotch Cap Lighthouse: Before and After the 1946 Tsunami**

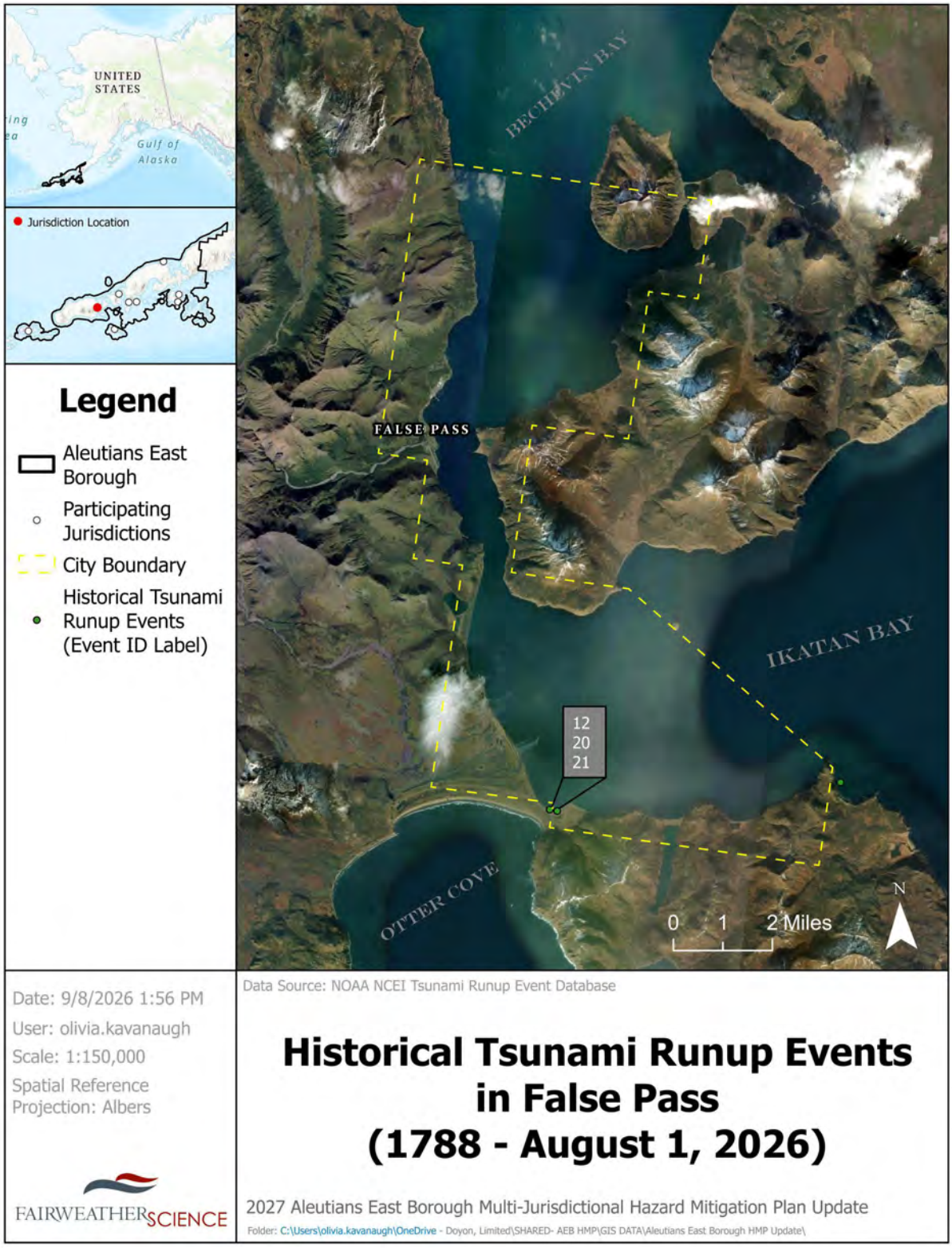



**Figure E-12- Historical Tsunami Runup Events in False Pass (1788 – August 1, 2026)**

### E.4.1.10.3 Extent (Magnitude and Severity)

Areas within the False Pass City boundary have experienced historical tsunami run up events from less than 10 feet to over 20 feet; however, none of these events impacted the population center of False Pass.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in False Pass is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

### E.4.1.10.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | While False Pass is located in a tsunami-prone region, there is little evidence that historical tsunamis have reshaped the community's overall landscape.<br>Historical tsunami events have resulted in runup events over 20 feet in an uninhabited area of False Pass. |
| Infrastructure | Historical tsunami events have not impacted infrastructure in False Pass. Critical facilities at risk of tsunami inundation include the Airport Lease Building, Tribal Council Warehouse/Grocery Store, Store, Silver Bay Seafoods Processing Plant, Isanotski Cemetery, City Park Playground, Isanotski Green House, Library & Post Office, False Pass School, Public Safety Building, City Office & Recreation Center, City Shop, Health Clinic, Airport Runway, ADOT&PF Grader Shed, City Dock, Boat Ramp, Cargo Handling Area, Hoblet Harbor, Cargo Pier, Electric Generator Building, and Fuel Farm. |
| People | Historical tsunami events have resulted in tsunami warnings and local evacuations in False Pass but have not resulted in any injuries or fatalities. |
| Utilities | There are no documented reports of historical tsunamis causing significant damage to utility infrastructure in False Pass, including its electrical, water, wastewater, or communications systems. Future tsunamis could damage utility infrastructure, which could result in prolonged service disruptions and outages. |
| Transportation | Historically, there are no documented reports of tsunamis causing significant damage to transportation infrastructure in False Pass. A significant tsunami could inundate some roadways to and from the airport and in an extreme event potentially inundate the runway and airport infrastructure from the south. Aircraft taking off or landing on the water (floatplanes) could be impacted directly by a significant wave causing damage to aircraft and people onboard the aircraft. |
| Economy | There have been no recorded instances of a tsunami impacting the community's economy in False Pass. |
| Subsistence Resources | There have been no recorded instances of a tsunami impacting the community's access to subsistence resources in False Pass. |

### E.4.1.10.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that False Pass will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

### E.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in False Pass is not anticipated to change in the future. |
| Location | The location of tsunami events in False Pass is not anticipated to change in the future. All low-lying coastal areas in False Pass will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in False Pass. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in False Pass. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in False Pass. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in False Pass, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in False Pass could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in False Pass, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in False Pass, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area. Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in False Pass. |

### E.4.1.11 Volcano

#### E.4.1.11.1 Location

The entire geography of False Pass is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Shishaldin.

According to the 2023 State of Alaska HMP, False Pass is located in a **moderate** volcanic ash hazard level area.

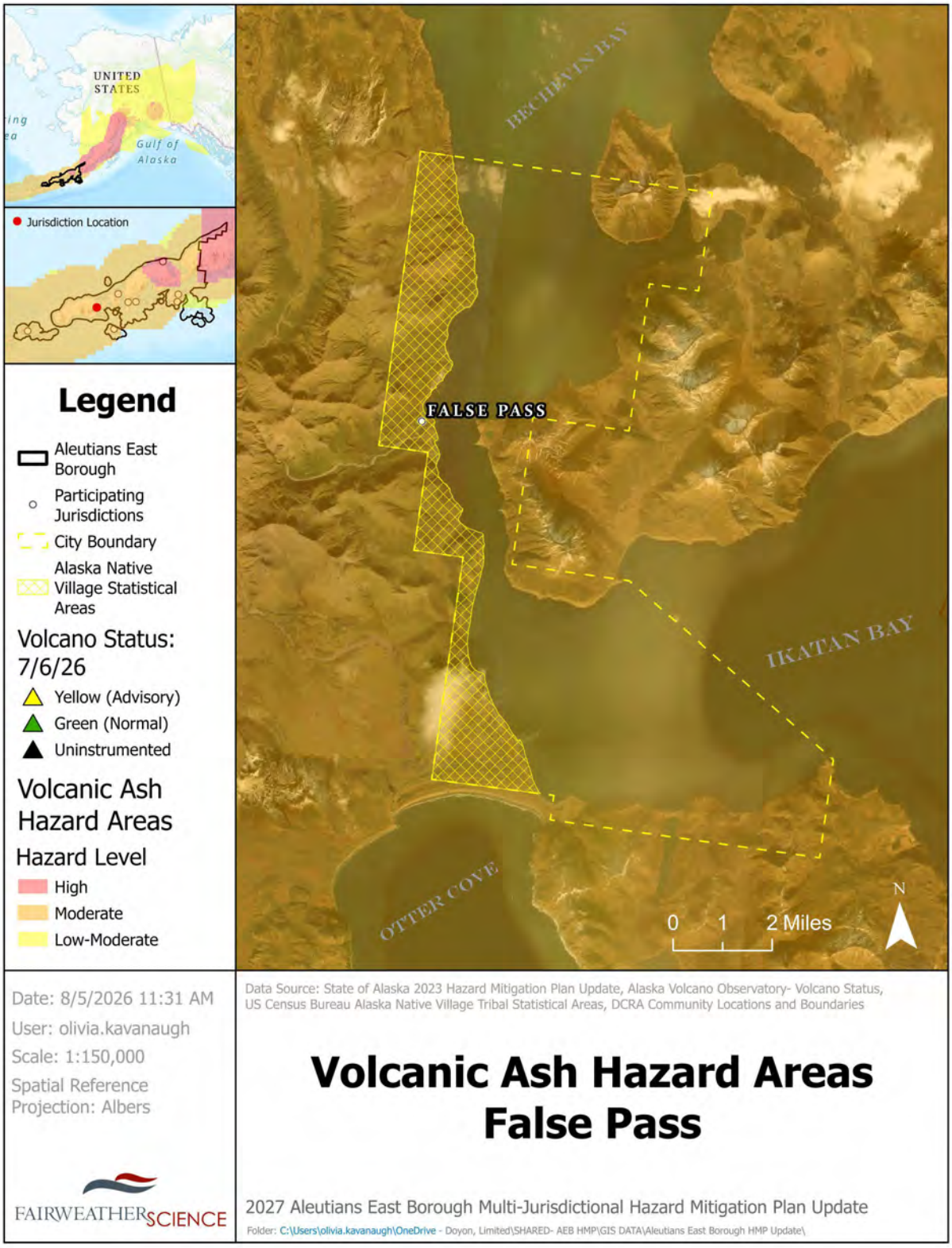



**Figure E-13- False Pass Volcanic Hazard Areas**

#### E.4.1.11.2 History

False Pass has had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to False Pass is **Mount Shishaldin**, which has resulted in several eruptions that has impacted the AEB, including False Pass. Located approximately 23 miles west of False Pass, Shishaldin has erupted a total of 24 times since 1900. In 2023, an eruption from Shishaldin resulted in False Pass experiencing volcanic ashfall for several months.

**Mount Westdahl** is a volcano that is located 55 miles west of False Pass. While not as recently active as Shishaldin, the 1991 eruption of Westdahl resulted in the smell of sulfur and light ashfall being reported by residents in False Pass.

#### E.4.1.11.3 Extent (Magnitude and Severity)

False Pass is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Shishaldin, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, False Pass has been impacted by a volcanic ashfall event on approximately 5 occasions, with the majority resulting in trace to light ashfall in the community. The notable exception occurred in 1946, when an eruption from Shishaldin impacted False Pass with over 2 inches of ash covering the community (AVO 2026).

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcanoes in False Pass is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### E.4.1.11.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding False Pass has been ashfall. While most of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposits (USGS 2015). |
| Infrastructure | The historical ashfall reported in False Pass has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of False Pass from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. |
| Utilities | While most historical volcanic eruptions impacting False Pass have not resulted in significant utility disruptions, reports from the 1946 Mount Shishaldin eruption indicated that the eruption caused electrical disturbances in the community. |
| Transportation | The primary transportation related impact from a volcanic eruption in False Pass is aircraft interruptions. There have been no reports of a volcanic eruption resulting in the closure of the False Pass airport. |
| Economy | The primary economic related impact from a volcanic eruption in False Pass is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations. |
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in False Pass that has impacted the community's access to subsistence resources. |

#### E.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact False Pass.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 7, it is **Highly Likely** that False Pass will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### E.4.1.11.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in False Pass. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in False Pass. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in False Pass. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in False Pass. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in False Pass. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in False Pass. |
| Land Use Development | Future climate conditions are not expected to influence land use development in False Pass. |
| Subsistence Resources | Future climate conditions are not expected to influence False Pass's ability to access subsistence resources. |

### E.4.1.12 Wildland Fire

The City of False Pass Planning Team did not select this hazard to be profiled in the MJHMP Update.

False Pass is located in an area with Very Low to Low Wildfire Exposure Risk (Figure E-14). Due to lack of available fuels and lack of historical events, the City of False Pass Planning Team is not concerned about the community's wildfire risk.

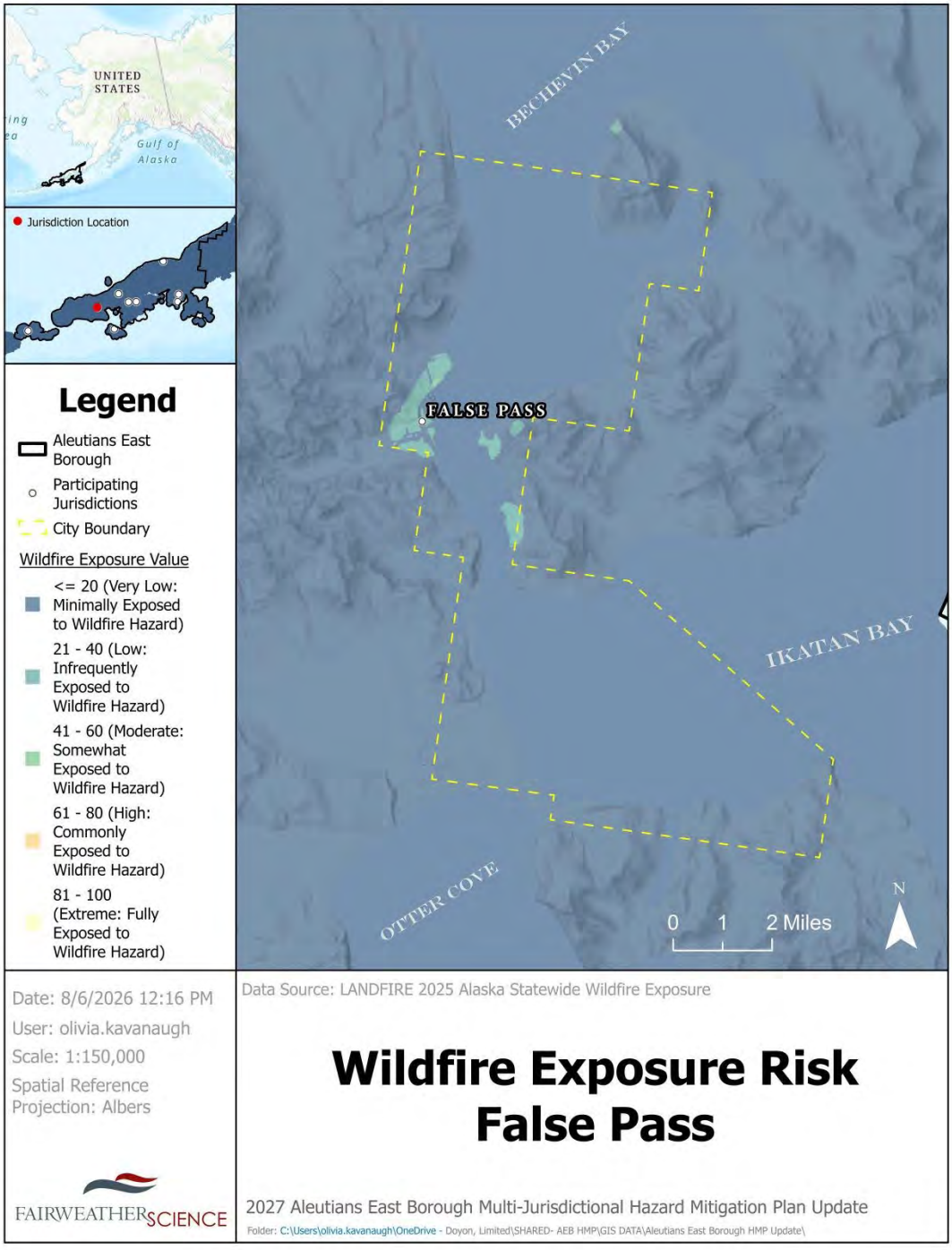
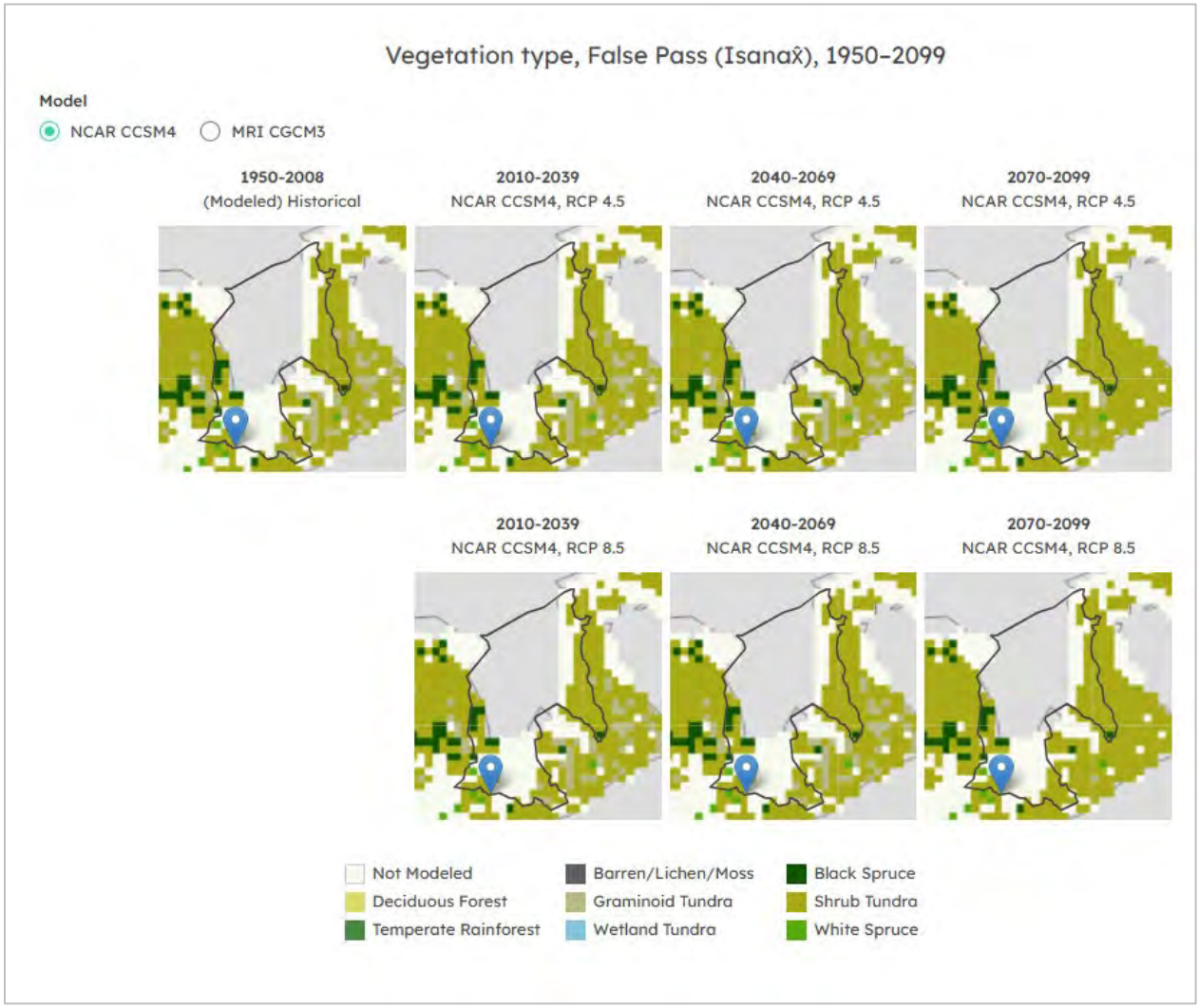



**Figure E-14- False Pass Wildfire Exposure Risk**

Vegetation Type: In False Pass, the predominant vegetation types are currently Shrub Tundra, Graminoid Tundra, and Black Spruce (UAF/SNAP 2026). Figure E-15 shows the projected changes in the location of vegetation in False Pass from 1950 through year 2099.

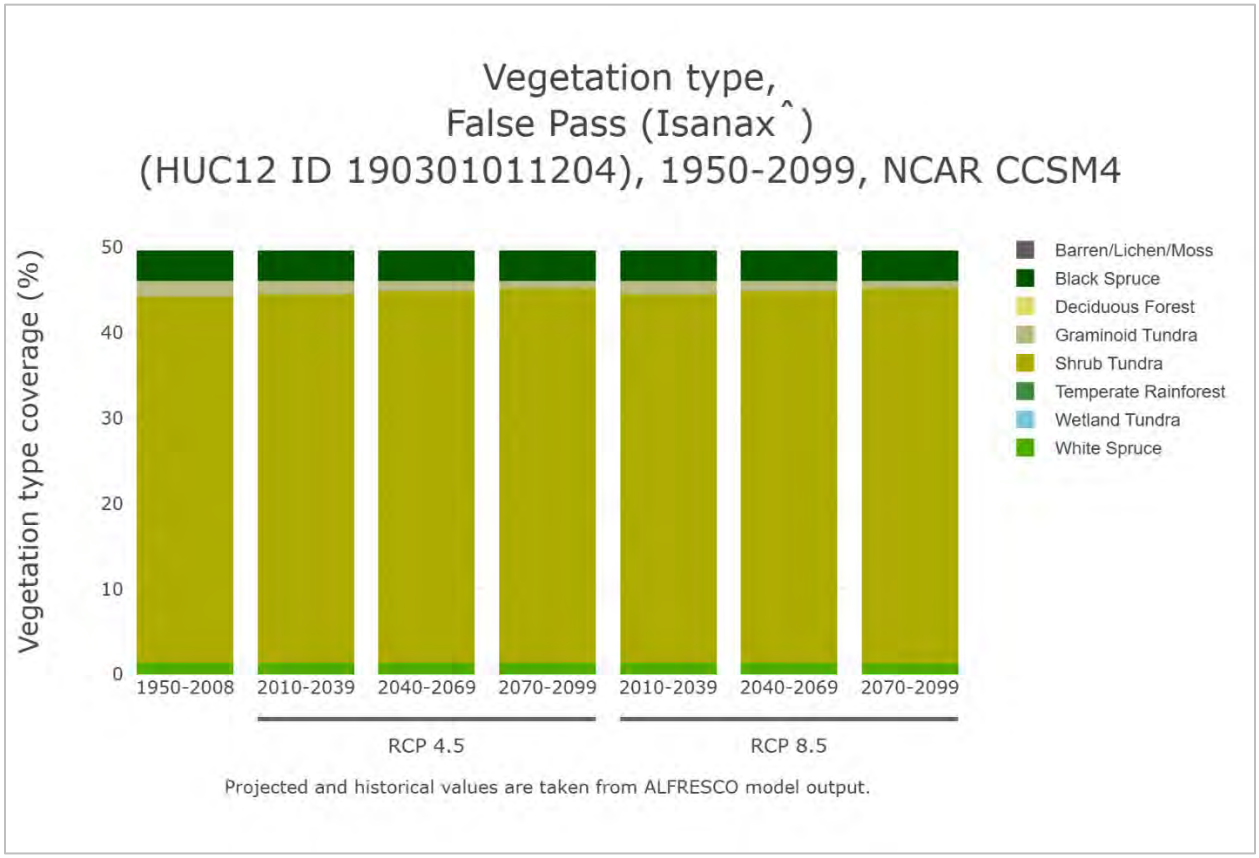



Source: UAF/SNAP 2026- Northern Climate Reports

**Figure E-15- False Pass Vegetation Type Map (1950 - 2099)**

Figure E-16 shows historical and projected changes in vegetation type coverage in False Pass from 1950 through year 2099.

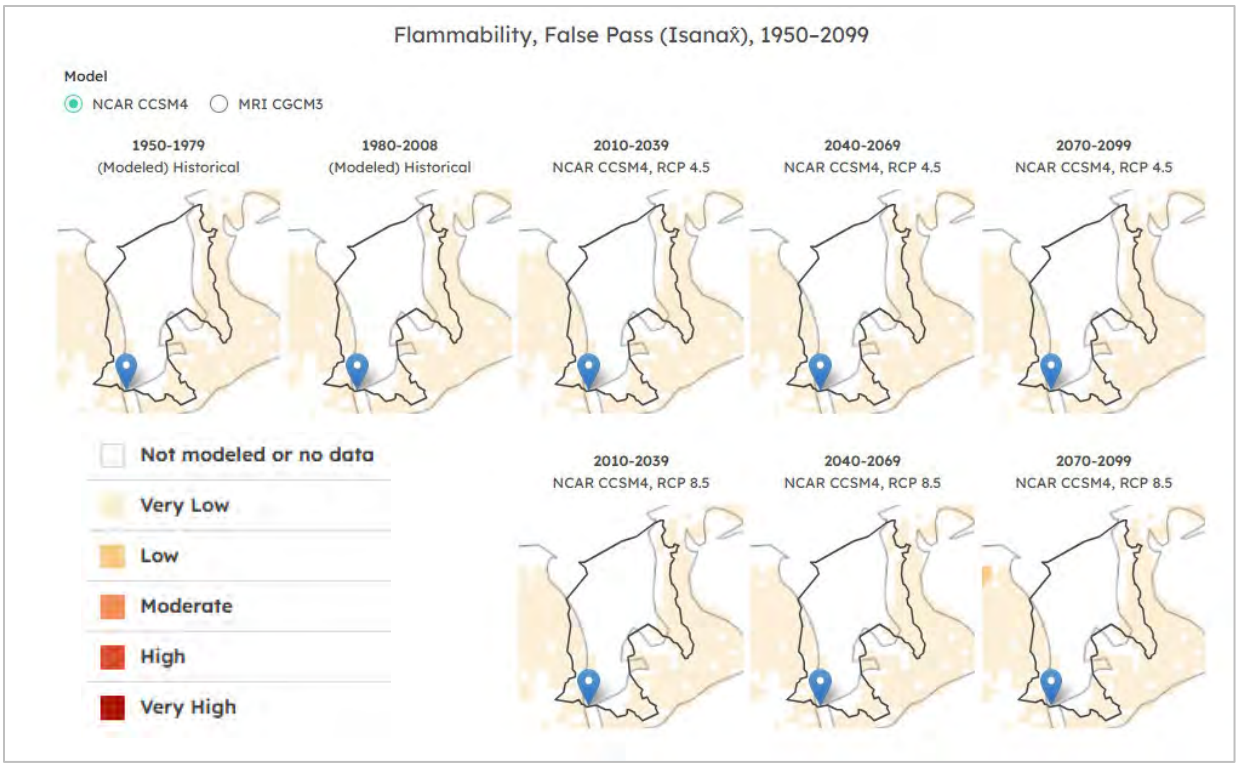
These models predict that the vegetation type in the community will stay relatively consistent through the end of the century, with a slight increase in the presence of Shrub Tundra and decrease in Graminoid Tundra type.




Source: UAF/SNAP 2026- Northern Climate Reports

**Figure E-16- False Pass Vegetation Type Graph (1950 - 2099)**

Flammability: Historically, False Pass has had Very Low flammability (UAF/SNAP 2026). Under the NCAR CCSM4 climate model, areas within False Pass are expected to remain Very Low flammability through the end of the century (Figure 46).




Source: UAF/SNAP 2026- Northern Climate Reports

**Figure E-17- False Pass Historical and Projected Flammability (1950 - 2099)**

## E.4.2 Critical Facilities

**Table E-3- Critical Facilities- City of False Pass**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | City of False Pass | Commercial | 3 | Isanotski Liquors | Mountain Valley Rd | 54.854612 | -163.414538 | $100,000 | MH | Private | Other | | | x | | x | x | x | x | x | | | |
| 2 | City of False Pass | Commercial | 0 | Residential Duplex | Larsen Dr | 54.854434 | -163.417555 | $100,000 | W1 | City | City | | | x | | x | x | x | x | x | | | |
| 3 | City of False Pass | Commercial | 100 | Silver Bay South Bunkhouse | Unimak Dr | 54.865499 | -163.412537 | $100,000 | W2 | Private | Other | | | x | | x | x | x | x | x | | | |
| 4 | City of False Pass | Commercial | 0 | Silver Bay S Shop | Unimak Dr | 54.865509 | -163.411853 | $100,000 | S3 | Private | Other | | | x | | x | x | x | x | x | | | |
| 5 | City of False Pass | Commercial | 100 | Silver Bay S LegoLand | Unimak Dr | 54.865965 | -163.410894 | $100,000 | S3 | Private | Other | | | x | | x | x | x | x | x | | | |
| 6 | City of False Pass | Commercial | 0 | Isanotski Warehouse | Unimak Dr | 54.866273 | -163.411082 | $100,000 | S3 | Private | Other | | | x | | x | x | x | x | x | | | |
| 7 | City of False Pass | Commercial | 40 | Isanotski Grocery Store | Unimak Dr | 54.86689 | -163.410217 | $1,000,000 | S2 | Private | Other | | | x | | x | x | x | x | x | | | |
| 8 | City of False Pass | Commercial | 250 | Silver Bay Seafoods Processing Plant | 100 Unimak Dr | 54.869869 | -163.408468 | $5,000,000 | S4 | Private | Other | | | x | | x | x | x | x | x | | | |
| 9 | City of False Pass | Commercial | 450 | Silver Bay Dormitories | 101 Unimak Dr | 54.870682 | -163.408211 | $1,000,000 | W1A | Private | Other | | | x | | x | x | x | x | x | | | |
| 10 | City of False Pass | Commercial | 0 | Round Top Creek Quarry | Old Landfill Rd | 54.849088 | -163.422823 | $1,000,000 | | | Other | | | x | | | x | x | | x | | | |
| 11 | City of False Pass | Community | 0 | Isanotski Cemetery | 101 Isanotski Rd | 54.854844 | -163.415576 | $1,000,000 | | | | | | x | | x | x | x | x | x | | | |
| 12 | City of False Pass | Community | 0 | City Park Playground | 18 Isanotski Dr | 54.852768 | -163.417387 | $100,000 | | City | City | | | x | | x | x | x | x | x | | | |
| 13 | City of False Pass | Community | 0 | Isanotski Green House | 18 Isanotski Dr | 54.852556 | -163.418116 | $100,000 | | City | City | | | x | | x | x | x | x | x | | | |
| 14 | City of False Pass | Community | 5 | Library & Post Office | 170 Unimak Dr | 54.855336 | -163.415078 | $1,000,000 | W2 | | City | | | x | | x | x | x | x | x | | | |
| 15 | City of False Pass | Education | 100 | False Pass School | 132 Flat Top Rd | 54.853003 | -163.41842 | $6,976,502 | W2 | AEB | | | | x | | x | x | x | x | x | | | |
| 16 | City of False Pass | Emergency Response | 2 | Public Safety | Larsen Dr | 54.855056 | -163.415896 | $500,000 | W2 | | City | | | x | | x | x | x | x | x | | | |
| 17 | City of False Pass | Government | 8 | Isanotski Corporation | 101 Isanotski Rd | 54.854034 | -163.415207 | $100,000 | W1A | | Other | | | x | | x | x | x | x | x | | | |
| 18 | City of False Pass | Government | 2 | City Office & Rec Center | Beach Rd | 54.854975 | -163.414765 | $1,000,000 | W2 | City | City | | | x | | x | x | x | x | x | | | |
| 19 | City of False Pass | Government | 5 | City Shop | Isanotski Dr | 54.851482 | -163.416079 | $500,000 | S2 | City | City | | | x | | x | x | x | x | x | | | |
| 20 | City of False Pass | Government | 5 | False Pass Tribal Council | 180 Unimak Dr | 54.862828 | -163.413463 | $100,000 | W2 | | Tribal | | | x | | x | x | x | x | x | | | |
| 21 | City of False Pass | Medical | 2 | Health Clinic | Larsen Dr | 54.855056 | -163.415896 | $1,000,000 | W2 | | City | | | x | | x | x | x | x | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | City of False Pass | Transportation | 0 | Airport Runway | 180 Unimak Dr | 54.850404 | -163.409617 | $50,000,000 | 0.5 miles of Gravel path | State | State | | | x | | x | x | x | x | x | | | |
| 23 | City of False Pass | Transportation | 0 | ADOT&PF Grader Shed | 180 Unimak Dr | 54.849361 | -163.410785 | $100,000 | S4 | State | State | | | x | | x | x | x | x | x | | | |
| 24 | City of False Pass | Transportation | 0 | City Dock | Unimak Dr | 54.864171 | -163.408151 | $60,000,000 | | City | City | | | x | | x | x | x | x | x | | | |
| 25 | City of False Pass | Transportation | 0 | Boat Ramp | Unimak Dr | 54.865651 | -163.409883 | $5,000,000 | | | City | x | | x | x | x | x | x | x | x | | | |
| 26 | City of False Pass | Transportation | 0 | Cargo Handling Area | Unimak Dr | 54.86704 | -163.411182 | $1,000,000 | | | City | | | x | | x | x | x | x | x | | | |
| 27 | City of False Pass | Transportation | 0 | Hoblet Harbor | Unimak Dr | 54.866081 | -163.408134 | $20,000,000 | S2 | | City | | | x | | x | x | x | x | x | | | |
| 28 | City of False Pass | Transportation | 0 | Harbor Cargo Ramp | Unimak Dr | 54.867078 | -163.408289 | $5,000,000 | | | City | x | | x | x | x | x | x | x | x | | | |
| 29 | City of False Pass | Transportation | 0 | Cargo Pier | Unimak Dr | 54.868021 | -163.409364 | $5,000,000 | | | City | | | x | | x | x | x | x | x | | | |
| 30 | City of False Pass | Transportation | 0 | Breakwaters | Unimak Dr | 54.865972 | -163.40696 | $20,000,000 | | | City | | | x | | x | x | x | | x | | | |
| 31 | City of False Pass | Utilities | 0 | Water Towers | Access Rd on Larsen Dr | 54.85685 | -163.418498 | $1,000,000 | | | City | | | x | | x | x | x | | x | | | |
| 32 | City of False Pass | Utilities | 0 | Electric Generator Building | Isanotski Dr | 54.851709 | -163.416384 | $500,000 | S3 | | City | | | x | | x | x | x | x | x | | | |
| 33 | City of False Pass | Utilities | 0 | Water Treatment Building | Bobby Dr | 54.853461 | -163.421717 | $500,000 | W2 | | City | | | x | | x | x | x | | x | | x | |
| 34 | City of False Pass | Utilities | 0 | Fuel Farm | Unimak Dr | 54.862319 | -163.414137 | $20,000,000 | | | Private | | | x | | x | x | x | x | x | | | |
| 35 | City of False Pass | Utilities | 0 | False Pass Water Dam | | 54.85572311 | -163.4270396 | $20,000,000 | | | | | | x | | | x | x | | x | | x | |
| 36 | City of False Pass | Utilities | 0 | Landfill | Landfill Rd | 54.873736 | -163.413837 | $500,000 | | | City | | | x | | x | x | x | | x | | | |
| **Total Occupants:** | | | **1072** | **Total Estimated Value:** | | | | **$229,576,502** | | | | | | | | | | | | | | | |

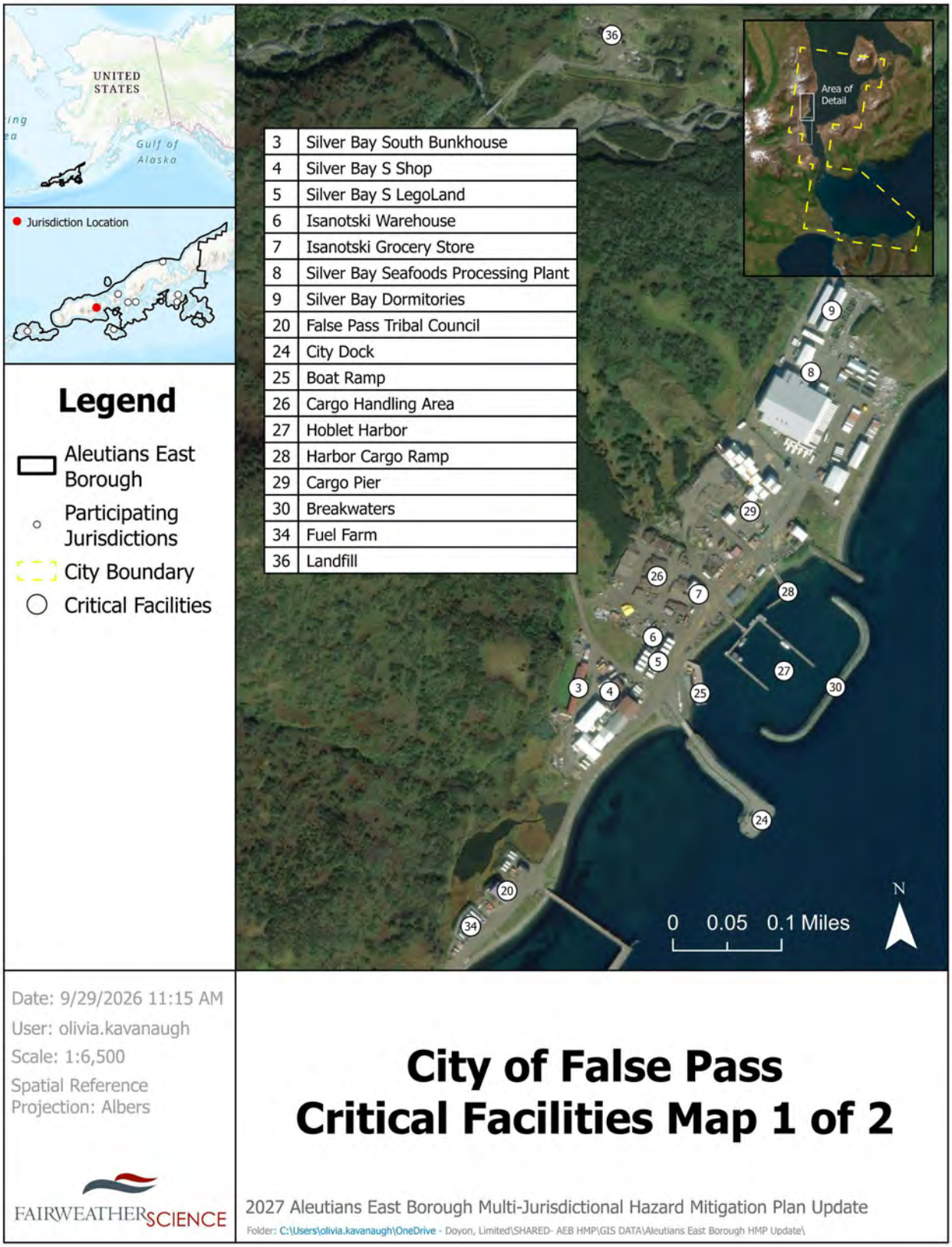



**Figure E-18- City of False Pass Critical Facilities Map 1 of 2**

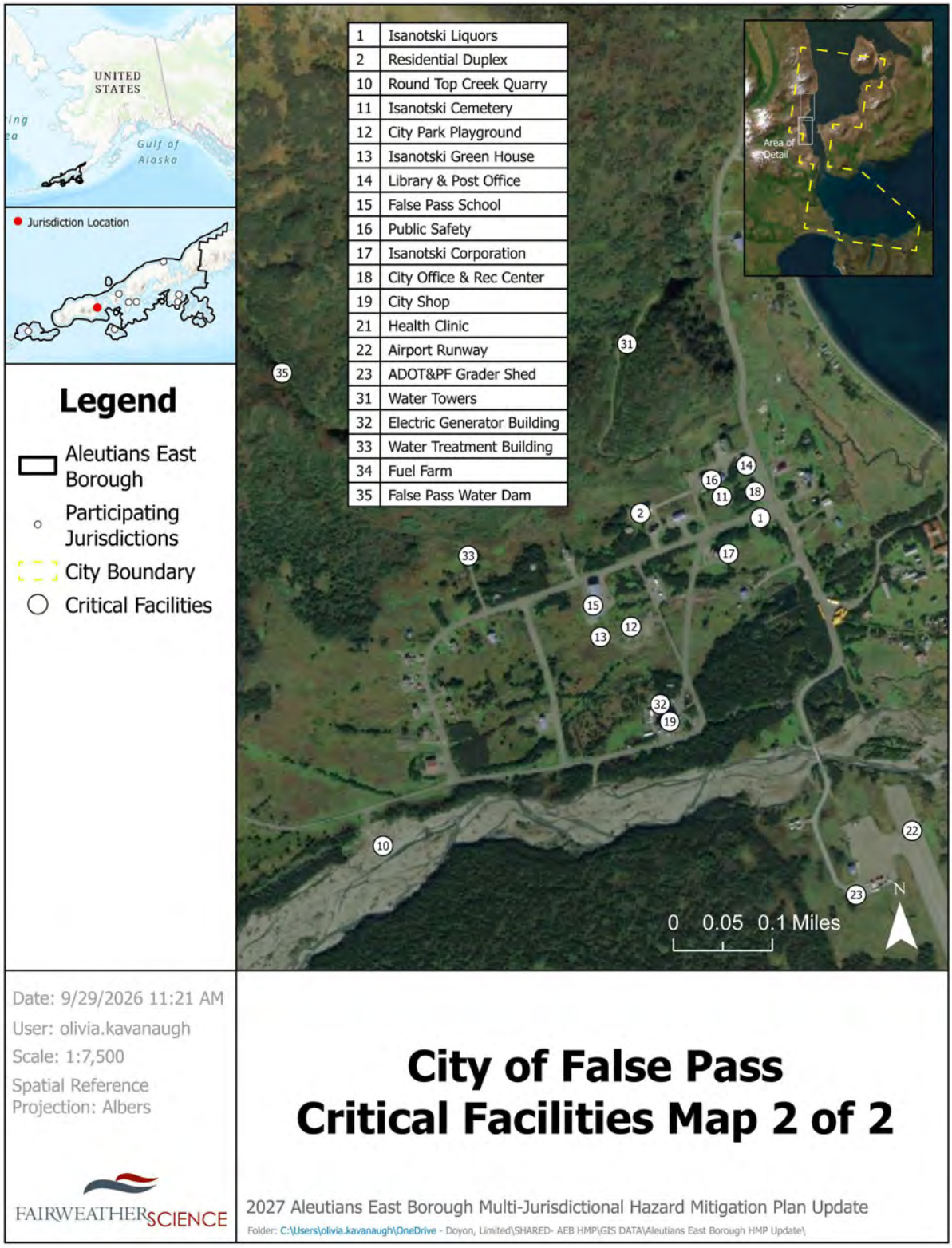



**Figure E-19- City of False Pass Critical Facilities Map 2 of 2**

## E.4.3 Summary of Vulnerability

**Table E-4- Jurisdictional Summary of Vulnerability- City of False Pass**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | 2 | 0 | $10,000,000 | 2 | 8 | $1,449,776 |
| Cryosphere-Snow Avalanche | Did not profile this hazard | | | | | |
| Earthquake | 36 | 1072 | $229,576,502 | 34 | 136 | $24,646,192 |
| Sediment Deterioration and Land Destabilization | 2 | 0 | $10,000,000 | 2 | 8 | $1,449,776 |
| \Flood | 34 | 1072 | $208,576,502 | 26 | 104 | $18,847,088 |
| Ground Failure/ Landslide | 36 | 1072 | $229,576,502 | 34 | 136 | $24,646,192 |
| Severe Weather | 36 | 1072 | $229,576,502 | 34 | 136 | $24,646,192 |
| Tsunami | 30 | 1072 | $186,576,502 | 23 | 92 | $16,672,424 |
| Volcano | 36 | 1072 | $229,576,502 | 34 | 136 | $24,646,192 |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | 2 | 0 | $20,500,000 | 4 | 16 | $2,899,552 |
| Invasive Species | 0 | 0 | $0 | 0 | 0 | $0 |

False Pass's vulnerability to natural hazards extends beyond potential damage to buildings and infrastructure. Subsistence is a mainstay of community life, and research involving False Pass describes access to subsistence foods as dependent on interconnected harvesting, accessing, processing, sharing, equipment, labor, and commercial-fishing functions (Reedy-Maschner and Maschner 2012). Disruptions affecting harvesting areas, transportation, fisheries, important providers, equipment, or sharing relationships may therefore create consequences extending beyond the directly affected harvester or household. These consequences are not fully represented in the quantitative exposure estimates above.

## E.5 Capability Assessment

***Note: the City of False Pass does not participate in the National Flood Insurance Program (NFIP).***

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| **Plans** | | |
| Capital Improvements Plan | Yes | Updated annually |
| Climate Change Adaptation Plan | No | |
| Community Wildfire Protection Plan | No | |
| Comprehensive/Master Plan | No | |
| Continuity of Operations Plan | No | |
| Economic Development Plan | Yes | Dated 1999 |
| Land Use Plan | No | |
| Local Emergency Operations Plan | Yes | Small Community Emergency Response Plan (SCERP) |
| Stormwater Management Plan | No | |
| Transportation Plan | No | The False Pass Tribe has a Long-Range Transportation Plan |
| **Land Use Planning and Ordinances** | | |
| Acquisition of land for open space and public recreation use | No | Land is owned by the Isanotski Corporation |
| Building code | No | |
| Flood insurance rate maps | No | |
| Floodplain ordinance | No | |
| Substantial Damage Plan | No | |
| Natural hazard specific ordinance (stormwater, steep slope, wildfire) | No | |
| Subdivision ordinance | No | |
| Zoning ordinance | No | |
| **Administrative** | | |
| Chief Building Official | No | |
| Civil Engineer | No | |
| Community Planner | No | |
| Emergency Manager | No | Not within the City. The Tribal VPSO (who is employed by APIA) would help serve in this position. |
| Floodplain Administrator | No | |
| GIS Coordinator | Yes | Utilizes contractors as needed |
| Planning Commission | No | |

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| **Technical** | | |
| Grant writing | Yes | Not a formal position. Utilizes contractors as needed |
| Hazard data and information | Yes | The City has access to hazard data through the Hazard Mitigation Plan |
| GIS analysis | Yes | Utilizes contractors as needed |
| Mutual aid agreements | No | |
| **Funding Resources** | | |
| Capital improvements project funding | No | |
| Community Development Block Grant | Yes | |
| Federal funding programs (non-FEMA) | Yes | Department of Energy for hydrokinetic power |
| Fees for water, sewer, gas, or electric services | Yes | |
| Impact fees for new development | No | |
| State funding programs | Yes | CDBG, CAP assistance, Alaska Energy Authority |
| Stormwater utility fee | No | |
| **Community Programs/Organizations** | | |
| Community newsletters | No | |
| Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events) | Yes | |
| Local news | No | |
| Organizations that represent/advocate for/interact with underserved and vulnerable communities/populations | Yes | Aleutian Pribilof Island Association (APIA) |
| Social media | Yes | The City has a Facebook page and is launching a website in late 2026/early 2027 |

Subsistence sharing and reciprocal support represent documented community resilience capabilities in False Pass. Research conducted in False Pass found that surveyed households received subsistence foods from others and that sharing relationships extended beyond the community (Reedy-Maschner and Maschner 2012). The study also documented the sharing of vessels and vehicles used for subsistence harvesting and arrangements in which households without boats contributed fuel to households with boats so they could participate in harvesting trips (Reedy-Maschner and Maschner 2012). These relationships can support household food access and community resilience, but their current structure and the information appropriate for public documentation should be confirmed through local engagement.

# E.6 Mitigation Strategy

## E.6.1 Mitigation Goals

The City of False Pass has identified its goals related to hazard mitigation as:

1. Protect critical infrastructure and community facilities from natural hazards
2. Implement actions to protect cultural and subsistence resources from natural hazards
3. Improve the resilience of transportation infrastructure
4. Strengthen emergency communications and warning systems
5. Implement public outreach/educational actions to increase awareness of hazards and promote overall preparedness
6. Increase community resilience through hazard planning, public education, emergency preparedness, and climate adaptation
7. Implement actions that protect the lives and property of residents and visitors from natural hazard events

## E.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

The City of False Pass reviewed mitigation actions identified in the 2021 AEB HMP and provided a status update for each action.

- ***Completed***- this action has been completed
- ***In Progress/Ongoing***- this action has been started is currently in-progress or ongoing
- ***Not Started***- this action has not been started

| ID | Action | Status |
|---|---|---|
| **1** | Identify buildings and facilities that must be able to remain operable during and following an earthquake event. | Ongoing<br>The City has a list of critical facilities that are inspected to ensure they are operable following an earthquake event |
| **2** | Consider participation in the Tsunami Awareness Program. | Completed |
| **3** | Install a tsunami siren. | Completed |
| **4** | Conduct special awareness activities, such as Winter Weather Awareness Week. | Ongoing |
| **5** | Dilapidated homes and debris become projectiles in severe windstorms with gusts greater than 100 mph. Remove debris. | Ongoing<br>The City and Tribe co-sponsor a community cleanup event each May |
| **6** | Update, as needed, emergency notification procedures and emergency planning for ash fall events. | Completed |
| **7** | Evaluate water treatment plant to ensure that ashfall can't enter the system. | Ongoing |
| **8** | Consider benefits of joining the NFIP. | Completed<br>The City has considered joining the NFIP but does not feel it is achievable or needed in the community |

| ID | Action | Status |
|---|---|---|
| **9** | Continue to monitor the concrete blocks and gravel at Unimak Drive and report to the USACE any erosion issues. | Ongoing |
| **10** | Erosion has occurred further south on the access road to Unimak Drive from City Pier to Fuel Road. Implement mitigation action. | Ongoing |
| **11** | Install culverts at Mountain Valley subdivision to prevent flooding over the road. | Completed |
| **12** | Repair the upper portion of the concrete boat ramp that has washed away. | Not Started- Remove<br>The City states that the boat ramp is beyond repair. |
| **13** | False Pass has a substandard gravel runway measuring 2,150 feet long by 60 feet wide, and the State requires a 3,100-foot runway. The runway also gets soft and becomes difficult to use during spring break-up, melting ice/snow and heavy rains, reducing aircraft performance and safety. The AEB is working with the City for a project to upgrade the runway. | In progress.<br>The City is currently coordinating with DOT on a project to resurface the runway apron and install new lighting. They are also working with DOT to update an airport layout plan to determine feasibility of building a new airport as the existing airport cannot be lengthened. |

## E.6.3 2027 Mitigation Action Plan

**Table E-5- 2027 Mitigation Action Plan- City of False Pass**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | All Hazards | Replace remote monitoring equipment at the water plant, including the turbidity meter and pumps, to improve reliability and operational monitoring. | H | City Administrator, Public Works | HMA, USDA, EPA | Structure and Infrastructure Projects | Water Plant | 0-2 years | B/C: This project would improve the reliability and monitoring of the water plant, helping prevent service disruptions and equipment damage during emergencies.<br>TF: This project is technically feasible using existing water plant infrastructure, with IT support for Wi-Fi and a small generator available for backup power. | SCERP/EOP; Water System/Utility Plan; Capital Improvement Plan; Emergency Operations/Continuity Plan |
| **2** | Cryosphere – Sea Ice | Regularly assess the City Dock and Fuel Dock for changing sea ice conditions and increased wave and storm exposure and inspect after significant sea ice events. | H | City Administrator, Public Works | City, USACE, NOAA, HMA, Alaska DGGS, Denali Commission | Other | City Dock, Fuel Dock | 0-2 years | B/C: This project would help identify damage and changing hazards at the docks, allowing repairs and maintenance to reduce future losses and operational disruptions.<br>TF: This project is technically feasible using existing City staff and resources, with inspections conducted regularly and after significant sea ice events. | SCERP/EOP; Port/Harbor Plan; Capital Improvement Plan; Comprehensive Plan |
| **3** | Cryosphere – Sea Ice | Retrofit or replace the City Dock and Fuel Dock as needed to improve resilience to changing sea ice and increased wave and storm exposure, with a focus on protecting utility lines, particularly water lines, from ice damage. | H | City Administrator, Public Works | MARAD PIDP, HMA, USACE, EDA, Denali Commission | Structure and Infrastructure Projects | City Dock, Fuel Dock | 3-4 years | B/C: This project would reduce the risk of damage and service disruptions by protecting the docks and critical water lines from sea ice, waves, and storms.<br>TF: This project is technically feasible but may require engineering assessments, specialized equipment, and outside contractors. | Capital Improvement Plan; Port/Harbor Plan; Comprehensive Plan; SCERP/EOP |
| **4** | Dam Failure | Complete formal assessment and dam breach inundation mapping of the False Pass Dam to determine risk of potential dam failure | M | City Administrator, Public Works | FEMA HHPD, HMA, USACE, Alaska DNR | Plans and Regulations | False Pass Dam | 0-2 years | B/C: This project would identify areas at risk from a potential dam failure and support emergency planning, evacuation, and future mitigation efforts.<br>TF: This project is technically feasible but will require qualified dam safety and engineering professionals to complete the assessment and inundation mapping. | SCERP/EOP; Comprehensive Plan; Capital Improvement Plan; Dam Safety Plan |
| **5** | Dam Failure | Develop a Dam Emergency Action Plan (EAP) with outlined procedures and protocols for the False Pass Dam in the event of a dam failure. | H | City Administrator, Public Works | FEMA HHPD, HMA, USACE, Alaska DNR, EMPG | Plans and Regulations | False Pass Dam | 0-2 years | B/C: This project would establish clear procedures for responding to a potential dam failure, improving coordination and reducing risks to downstream residents.<br>TF: This project is technically feasible with support from dam safety professionals and appropriate local, State, and Federal agencies. Contractor support to develop the EAP may be needed. | SCERP/EOP; Dam Safety Plan; Emergency Response Plan |
| **6** | Dam Failure | Provide dam safety information through various communication channels, including websites and social media, to residents downstream of the dam to increase awareness of potential hazards, emergency procedures, and evacuation routes. | H | City Administrator | EMPG, FEMA HHPD | Education and Awareness Programs | False Pass Dam | 0-2 years | B/C: This project would increase resident awareness of dam failure hazards, emergency procedures, and evacuation routes, improving preparedness for a potential emergency.<br>TF: This project is technically feasible using existing City communication | SCERP/EOP; Public Information/Outreach Plan; Comprehensive Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | channels and coordination with emergency management agencies. | |
| **7** | Dam Failure | Identify and establish a permanent secondary potable water source with treatment and chlorination capabilities, including 1,000-gallon emergency storage and 2,000-gallon regular-use capacity. | H | City Administrator, Public Works | USDA, UPA, Alaska DEC, HMA | Structure and Infrastructure Projects | Water Plant | 0-2 years | B/C: This project would provide a reliable backup water source during emergencies, reducing the risk of water service disruptions following a hazard event. TF: This project is technically feasible but will require engineering, treatment and chlorination equipment, and funding for construction and maintenance. | Water System Plan; SCERP/EOP; Capital Improvement Plan; Continuity of Operations Plan |
| **8** | Earthquake | Regularly inspect critical buildings and facilities following an earthquake event to ensure they remain structurally sound, safe for occupancy, and operational, and to identify and address damage or hazards promptly. | H | City Administrator, Public Works | City, HMA, EMPG | Other | All | 0-2 years | B/C: This project would help identify structural damage and safety hazards following an earthquake, reducing the risk of injury and allowing critical facilities to return to service safely. TF: This project is technically feasible using qualified building inspectors or engineers, with outside assistance as needed. | SCERP/EOP; Continuity of Operations Plan; Facilities Management Plan |
| **9** | Earthquake | Assess facilities for seismic risk and shaking impacts and retrofit high-risk facilities as needed. | L | City Administrator, Public Works | HMA, USGS, Denali Commission | Structure and Infrastructure Projects | All | 0-2 years | B/C: This project would identify and reduce seismic vulnerabilities in critical facilities, helping prevent damage and maintain essential services following an earthquake. TF: This project is technically feasible but may require structural engineering assessments, specialized contractors, and funding for needed retrofits. | Capital Improvement Plan; Comprehensive Plan; Facilities Management Plan; SCERP/EOP |
| **10** | Flood | Pursue funding to map coastal/creek flood hazard areas/risk in False Pass | H | City Administrator | HMA, NOAA Coastal Resilience, Alaska DGGS, USACE, ANTHC | Plans and Regulations | NA | 3-4 years | B/C: This project would identify areas at risk from coastal and creek flooding, supporting informed planning and reducing future damage to people and property. TF: This project is technically feasible with funding and support from qualified mapping and engineering professionals. | Comprehensive Plan; Capital Improvement Plan; SCERP/EOP |
| **11** | Flood, Sediment Deterioration and Land Destabilization | Continue to coordinate with Alaska DOT on the project to resurface the False Pass airport runway apron, install new lighting, and long-term erosion solution near the airport. | H | City Administrator | FAA, USACE, HMA, Denali Commission, Alaska DOT | Structure and Infrastructure Projects | Airport | 0-2 years | B/C: This project would improve airport safety and reliability while reducing the risk of erosion-related damage and disruptions to airport operations. TF: This project is technically feasible through continued coordination with Alaska DOT and may require agency funding and engineering support. | Airport Layout Plan; Capital Improvement Plan; Transportation Plan |
| **12** | Flood, Sediment Deterioration and Land Destabilization | Continue to coordinate with Alaska DOT on updating the Airport Layout Plan to determine feasibility of constructing a new airport in False Pass with a longer runway. | H | City Administrator | FAA, USACE, HMA, Denali Commission, Alaska DOT | Structure and Infrastructure Projects | Airport | 0-2 years | B/C: This project would assess the feasibility of a longer runway and improved airport layout, potentially improving transportation reliability and emergency access. TF: This project is technically feasible as a planning and assessment effort, with Alaska DOT coordination and additional engineering and environmental studies as needed. | Airport Layout Plan; Comprehensive Plan; Transportation Plan; Capital Improvement Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **13** | Flood, Sediment Deterioration and Land Destabilization | Repair and replace culverts as needed to maintain proper drainage and reduce flooding and sediment deterioration risks. | H | City Administrator, Public Works | HMA, Alaska DOT | Structure and Infrastructure Projects | Culverts | 3-4 years | B/C: This project would improve drainage and reduce flooding, erosion, and sediment-related damage to roads and other infrastructure.<br>TF: This project is technically feasible using standard drainage and roadway construction methods, with funding and equipment needed for repairs or replacement. | Capital Improvement Plan; Transportation Plan; Stormwater/Drainage Plan; Comprehensive Plan |
| **14** | Ground Failure/Landslide | Work with the State DGGS to map slopes and identify landslide-prone areas in False Pass. | M | City Administrator | USGS, HMA, Alaska DGGS, Denali Commission | Plans and Regulations | NA | 3-4 years | B/C: This project would identify landslide-prone areas and help the community make informed decisions about development, infrastructure, and future mitigation.<br>TF: This project is technically feasible through coordination with State DGGS and qualified geologic and mapping professionals. | Comprehensive Plan; Capital Improvement Plan; SCERP/EOP; Land Use Plan |
| **15** | Invasive Species | Increase community education on invasive species through the City website and public information signs at popular recreation sites and trailheads. | H | City Administrator | USDA NRCS, USFWS, NOAA, EMPG | Education and Awareness Programs | NA | 0-2 years | B/C: This project would increase public awareness of invasive species and help reduce their introduction and spread within the community.<br>TF: This project is technically feasible using existing City communication channels, signage, and community outreach resources. | Comprehensive Plan; Environmental Plan; SCERP/EOP |
| **16** | Invasive Species | Adopt a local ordinance requiring inspections of barges and other vessels to prevent rats from entering the community. | H | City Administrator | NOAA, USFWS, State DEC | Plans and Regulations | NA | 0-2 years | B/C: This project would reduce the risk of rats and other invasive species entering the community through incoming vessels and barges.<br>TF: This project is technically feasible through local ordinance development and enforcement, with coordination with vessel operators and applicable agencies. | SCERP/EOP; Environmental Plan; Port/Harbor Plan; Ordinances/Code |
| **17** | Invasive Species | Identify resources and funding opportunities for alder removal and management. | H | City Administrator | USDA, USFWS, NOAA | Natural Systems Protection | NA | 0-2 years | B/C: This project would reduce the spread and impacts of invasive alder and help protect local habitats and community resources.<br>TF: This project is technically feasible with appropriate funding, equipment, and potential coordination with qualified contractors or resource management agencies. | Environmental Plan; Natural Resources Plan; Comprehensive Plan |
| **18** | Sediment Deterioration and Land Destabilization | Continue to monitor erosion along Unimak Drive and report to the USACE any erosion issues. | M | City Administrator, Public Works | USACE, NOAA Coastal Resilience, HMA | Natural Systems Protection | Road | 0-2 years | B/C: This project would help identify erosion problems early and support timely repairs, reducing the risk of damage to Unimak Drive and associated infrastructure.<br>TF: This project is technically feasible using existing City resources and coordination with the USACE. | Transportation Plan; Capital Improvement Plan; SCERP/EOP |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **19** | Sediment Deterioration and Land Destabilization | Pursue funding for long-term erosion solution on Unimak Drive | H | City Administrator, Public Works | USACE, HMA, NOAA Coastal Resilience, EDA, Denali Commission | Natural Systems Protection | Road | 0-2 years | B/C: This project would reduce future erosion damage and help maintain reliable access along Unimak Drive. TF: This project is technically feasible but will require engineering studies, funding, and coordination with the USACE and other agencies. | Transportation Plan; Capital Improvement Plan; Comprehensive Plan |
| **20** | Severe Weather | Conduct community awareness activities, such as Winter Weather Awareness Week, to promote preparedness and safety during severe winter weather. | L | City Administrator | City, EMPG | Education and Awareness Programs | NA | 0-2 years | B/C: This project would increase community preparedness and promote safer actions during severe winter weather events. TF: This project is technically feasible using existing City communication channels and community outreach resources. | SCERP/EOP; Emergency Preparedness Plan |
| **21** | Severe Weather | Continue removing debris throughout the community to reduce the risk of flying debris during severe windstorms with gusts greater than 100 mph. | M | City Administrator | HMA, City, EMPG | Natural Systems Protection | All | 0-2 years | B/C: This project would reduce the risk of debris becoming airborne during severe windstorms, helping protect people, buildings, and infrastructure. TF: This project is technically feasible using existing City resources, equipment, and community cleanup efforts. | SCERP/EOP; Public Works/Capital Improvement Plan |
| **22** | Tsunami | Work with AEB to identify and evaluate alternative sites for a new False Pass School outside the tsunami inundation area. | M | City Administrator, School Administrator | NOAA, HMA, Alaska DGGS, Denali Commission | Plans and Regulations | School | 0-2 years | B/C: This project would evaluate options for locating the school outside the tsunami inundation area, reducing risk to students and staff during a tsunami. TF: This project is technically feasible as a planning effort but would require coordination with AEB, site studies, funding, and additional engineering. | Comprehensive Plan; School Facilities Plan; Capital Improvement Plan; SCERP/EOP |
| **25** | Tsunami | Build an emergency shelter outside the tsunami inundation area to provide a safe location for residents during a tsunami or other coastal emergency. | H | City Administrator | HMA, Denali Commission | Structure and Infrastructure Projects | Tsunami Shelter | 3-4 years | B/C: This project would provide a safe location for residents during a tsunami or other coastal emergency, reducing exposure to hazardous conditions. TF: This project is technically feasible but will require a suitable site, engineering and construction, and funding. | SCERP/EOP; Comprehensive Plan; Capital Improvement Plan; Shelter Plan |
| **26** | Tsunami | Develop and mark tsunami evacuation routes; install signs and identify high-ground assembly areas. | H | City Administrator, Public Works | NOAA, HMA, EMPG, Alaska DHS&EM | Structure and Infrastructure Projects | NA | 0-2 years | B/C: This project would provide clear, visible evacuation routes and assembly areas, helping residents evacuate more quickly and safely during a tsunami. TF: This project is technically feasible using existing City signs and resources, with installation at designated evacuation routes and high-ground assembly areas. | SCERP/EOP; Tsunami/Emergency Evacuation Plan; Comprehensive Plan |
| **27** | Volcano | Continue evaluating the water treatment plant and intake system to prevent ashfall from entering the water supply and continue shutting off the water supply valve during ashfall events. | H | City Administrator, Public Works | HMA, EPA, USDA, USGS | Natural Systems Protection | Water Plant | 0-2 years | B/C: This project would reduce the risk of volcanic ash entering the water supply and help maintain safe drinking water during ashfall events. TF: This project is technically feasible using existing water system infrastructure, with continued evaluation | Water System Plan; SCERP/EOP; Continuity of Operations Plan; Capital Improvement Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | and operational procedures for shutting off the intake during ashfall. | |
| **28** | Volcano | Create emergency kits with public education materials for volcanic ashfall, including ash-rated masks. Make kits available at the City Office or other key community location for distribution. | M | City Administrator | EMPG, USGS | Education and Awareness Programs | NA | 0-2 years | B/C: This project would provide residents with basic protective supplies and information, improving preparedness and reducing health risks during volcanic ashfall events.<br>TF: This project is technically feasible using standard emergency supplies and existing City distribution locations. | SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan |

### E.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Repair the upper portion of the concrete boat ramp that has washed away. | The boat ramp is beyond repair |
| Install backup generators in all critical facilities. | The City has portable generators to use as needed |
| Relocate critical facilities out of known high risk hazard areas. If relocation is not feasible, retrofit facilities to be more resilient to hazards (elevate, etc.). | Due to limited available land, relocation is not feasible |
| Install earthquake straps on heavy/tall furniture in critical facilities to reduce the potential of damage/injuries during an earthquake. | Furniture in City facilities are secured/anchored to the wall |
| Relocate key critical facilities out of known flood hazard areas. | Due to limited available land, relocation is not feasible |
| Provide an annual community workshop on how to mitigate impacts of invasive slugs on local gardens. | Invasive slugs have not been documented in False Pass and are not of concern at this time |
| Install warning signs in landslide prone areas. | Would need to complete formal landslide mapping first to determine hazard areas. |
| Adopt an ordinance to prohibit removal of vegetation in landslide areas. | Removal of vegetation is not an issue in the community and it is increasing the frequency of landslides in False Pass |

# E.7 Plan Update

## E.7.1 Changes in Development, including in Hazard-Prone Areas (Current and Future)

### E.7.1.1 Changes in Development Since 2021

There has been little development in False Pass between 2021 and 2026, and the City's overall vulnerability to natural hazards has not significantly changed.

### E.7.1.2 Future/Planned Development

Future development in False Pass includes a new school that is right sized for the current population. The City is also continuing to work with DOT to upgrade the airport, with plans to build a new airport with a longer runway.

The City intends to coordinate with the Aleutians East Borough on the planned location of the False Pass School to determine if a location outside of the tsunami inundation area is feasible.

These planned developments are not anticipated to increase or decrease the City's vulnerability to natural hazards. If a location outside of the tsunami hazard area is feasible, the City's vulnerability to tsunami hazards will decrease.

## E.7.2 Changes in Priorities and Mitigation Efforts

The City's priorities and mitigation efforts in the previous HMP mainly focused on flooding and erosion.

The City's priorities and goals in this HMP shift towards brick-and-mortar mitigation projects. The highest priority for the City is increasing the available water supply in the community and mitigating the potential of a dam failure.

# E.8 Plan Maintenance

## E.8.1 Planning Team MJHMP Maintenance Commitment

The City of False Pass is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.6.

The City of False Pass is committed to annually reviewing the Plan and City staff will work to complete their review responsibilities.

## E.8.2 Continued Public Involvement

The City of False Pass is dedicated to continued public involvement over the next five years.

The City of False Pass will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2032.

## E.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The City of False Pass jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The City Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### E.8.3.1.1 Implementing

Upon adoption of the Plan, the City of False Pass will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The City will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### E.8.3.1.2 Monitoring

The City of False Pass will monitor the progress of mitigation actions on an annual basis. The City Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### E.8.3.1.3 Evaluating

The City of False Pass will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

#### E.8.3.1.4 Updating

The City of False Pass will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.6(c)(4)(i). The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Figure E-20 provides a visual of the HMP plan maintenance activities per year.

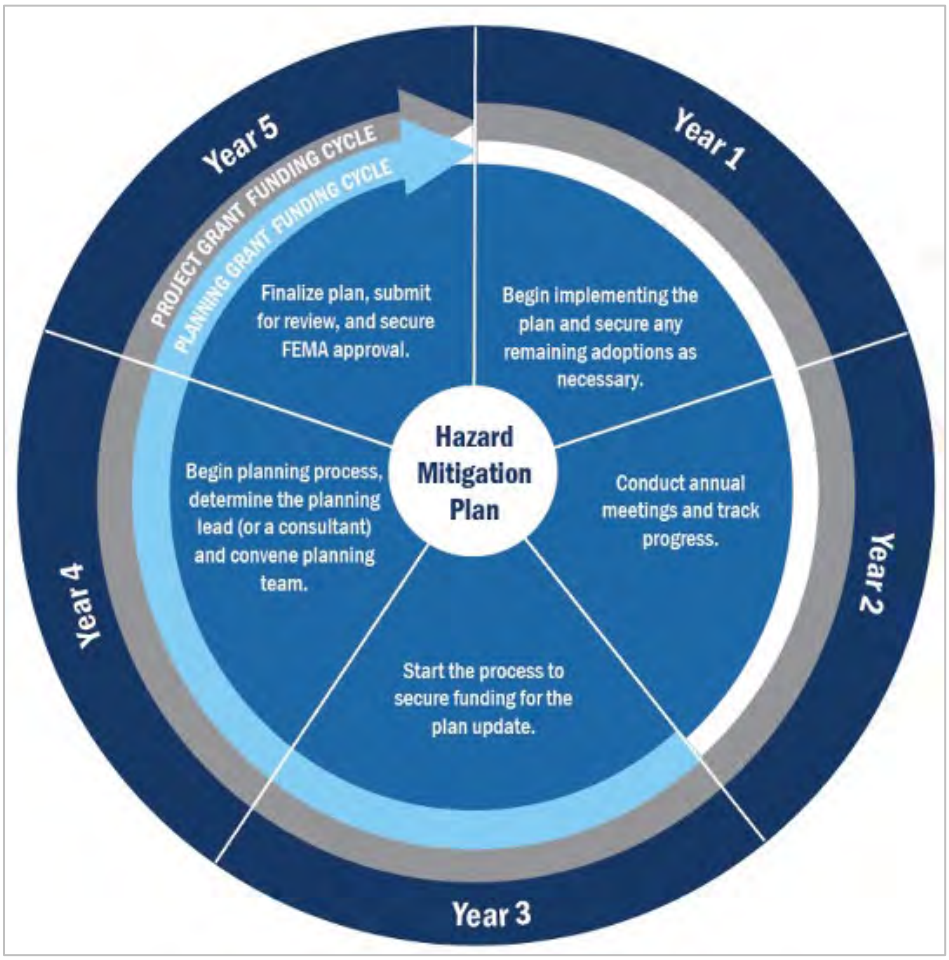



**Figure E-20- HMP Update Schedule**

## E.8.4 Plan Integration

The City of False Pass will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other planning and implementation processes, when appropriate.

The City will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the City's comprehensive and land use planning processes, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects.

As the plan is implemented, the City of False Pass will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## E.9 Plan Adoption

The City of False Pass formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

[insert signed adoption resolution]

# F. Native Village of False Pass



Photo Credit: CoastView

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# F.1 Planning Team and Tribal Definition of Public

## F.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Lena Hoblet** | Tribal Administrator / Grant Writer |
| **Nikki Hoblet** | City Administrator |
| **Carleen Hoblet** | City Clerk |
| **Billy Shelikoff** | Water Plant Operator |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

## F.1.2 Tribal Definition of Public

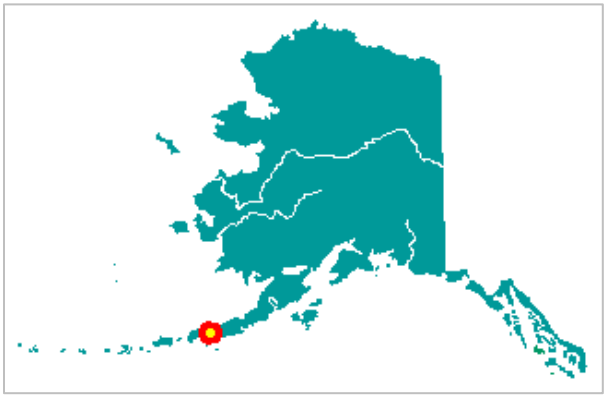
For this planning process, the Native Village of False Pass defines the “public” as enrolled Tribal citizens, residents of False Pass, local businesses and employers, partner governments and organizations, and other individuals with knowledge of or an interest in hazards affecting the community. All community residents may complete surveys and comment on drafts, while the Tribal Council retains authority to adopt the plan for the Tribe.

This definition ensures that anyone who lives or works within the community, as well as enrolled Tribal Members residing outside the community, is eligible to attend and participate in the public involvement portion of the HMP Update planning process.

# F.2 Community Profile

## F.2.1 Location and Geography

False Pass is located on the eastern shore of Unimak Island on a strait connecting the Pacific Gulf of Alaska to the Bering Sea. It is 646 air miles southwest of Anchorage. It lies at approximately 54.8549º north latitude and -163.4119º west longitude. The area encompasses 26.8 square miles of land and 41.4 square miles of water.



## F.2.2 History

The name False Pass is derived from the fact that the Bering Sea side of the strait is extremely shallow and cannot accommodate large vessels. The area was originally settled by a homesteader in the early 1900s and grew when P.E. Harris established of a cannery in 1917. When the cannery was built, natives migrated from the now abandoned communities of Morzhovoi, Sanak Island, and Ikatan.

A post office was established in 1921. The cannery operated continuously, except from 1973 to 1976, when two hard winters depleted the fish resources. It was destroyed by fire in March 1981 and was not rebuilt, but it remained a supply base until 2003 when Peter Pan Seafoods announced its closure. The fishing fleet continues to use the site as a refuelling station. The city was incorporated in 1990. Fishing, fish processing, and subsistence activities are mainstays of the community lifestyle in False Pass.

## F.2.3 Population

The 2020 Decennial Census recorded a population of 397. In 2025, the DCRA estimated a population of 398. The 2024 American Community Survey Demographic and Housing Estimates recorded a total population of 151 with a margin of error of ± 273.

## F.2.4 Demographics

There are currently 121 Tribal Members for the Native Village of False Pass.The tribal demographics of the Native Village of False Pass are majority Alaska Native but not enough data exists to determine the demographics of tribal members of two or more races

For the whole geography of False Pass, though the community population estimates vary between sources, the 2024 ACS reports a demographic composition of 6% White alone, 43.7% American Indian and Alaska Native, and 29.8% some other race, with Black or African American, Asian, and Native Hawaiian and Other Pacific Islander all reporting 0.0% of the population. White and some other races make up 20.5% of the population. 55% of the population identifies as Hispanic or Latino.

## F.2.5 Economy

While the Peter Pan cannery and supply site may have closed, the fisheries industry still drives much of the economy in False Pass. Both the Bering Sea and Bristol Bay fleets use False Pass as a major refueling stop. From 2000 to 2002, Bering Pacific Seafoods operated as a local cooperative cannery, reopening for the 2008 salmon season. As of 2011, six local fishermen held nine commercial salmon fishing permits. The primary employers in the community are the City of False Pass, Isanotski Corporation, Native Village of False Pass, and Silver Bay Seafoods.

Subsistence harvesting also contributes to household food access and economic resilience in False Pass. Research involving False Pass describes subsistence as an interconnected social, cultural, and economic

system involving harvesting, processing, sharing, exchange, access to commercial fisheries, equipment, labor, and social relationships (Reedy-Maschner and Maschner 2012).

## F.2.6 Land Use

Due to the provisions of the ANCSA, the regional and village native corporations received title to property in their traditional lands. The Isanotski Corporation holds title to significant surface lands while The Aleut Corporation holds title to the subsurface resources. The undeveloped land surrounding False Pass is primarily Alaska Native Land, owned by the Isanotski Corporation. Tribal members use the land surrounding False Pass for subsistence, cultural, and recreational purposes.

## F.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following jurisdictional-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **1999 Overall Economic Development Plan** | Provides long-term strategies for economic development and growth in the AEB and its communities | Used relevant information to develop the Community Profile |
| **2007 USACE Erosion Information Paper- False Pass** | Baseline erosion assessment of the community. | Used to describe historical erosion locations, rates, and impacts in the communities where reports were available. |
| **2010 & 2021 Aleutians East Borough MJHMP** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **2025 False Pass Water Intake Investigation Technical Memo** | Describes the findings of the engineers' site visit including the current (2025) site conditions of the False Pass Water Dam, and recommendations related to the structure | Used information in the Dam Failure hazard profile, suggested mitigation actions related dam failure |
| **2025 Tsunami Inundation Map of False Pass, Alaska** | Identify potential tsunami hazards for the community and model the extent of tsunami waves generated earthquake and landslide events. | Referenced data in Tsunami hazard profile/annex. Used inundation maps as the data source for potential losses due to tsunami event. |

Source: State of Alaska Community Plans Library, HDR 2025, Troshina, E.N., Salisbury, J.B., and Nicolsky, D.J., 2025

# F.4 Risk Assessment

## F.4.1 Hazards

The Native Village of False Pass Planning Team identified the following natural hazards that may impact their geography/community.

- ✓ Hazard profiled for this jurisdiction in the MJHMP Update
- X Hazard not profiled for this jurisdiction in the MJHMP Update

- ✓ Changes in the Cryosphere- Sea Ice
- X Changes in the Cryosphere- Snow Avalanche
- ✓ Dam Failure
- ✓ Earthquake
- ✓ Flood
- ✓ Ground Failure/Landslide
- X Invasive Species
- ✓ Sediment Deterioration and Land Destabilization
- ✓ Severe Weather
- ✓ Tsunami
- ✓ Volcano
- X Wildland Fire

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere- Sea Ice | 2- Possible | 2- Limited | While sea ice is less common in the Aleutian Islands than farther north in the Bering Sea, affected locations include exposed coastlines around False Pass. The Planning Team reported that sea ice runup has resulted in damage to the City Dock (Fuel Dock), pile, and navigation buoys. |
| Cryosphere- Snow Avalanche | Did not profile this hazard. | | |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and False Pass itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 2- Possible | 2- Limited | Sediment deterioration and land destabilization can occur throughout False Pass, with coastal and riverine land destabilization being the biggest concerns for the community.<br>Since False Pass is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surges, high winds, and severe storms that contribute to destabilization along the community's extensive coastline. |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Flood | 3- Likely | 2- Limited | The Planning Team reports that low-lying waterfront areas in False Pass have experienced coastal flooding, storm surge, and high tides. Other flooding-prone areas include the runway and roadways. |
| Ground Failure/ Landslide | 2- Possible | 4- Catastrophic | False Pass is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity. Landslides have been reported by the Planning Team in False Pass. |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of False Pass is susceptible to severe weather events and impacts. The Planning Team reports experiencing high winds and extreme cold events. |
| Tsunami | 3- Likely | 4- Catastrophic | According to FEMA's National Risk Index, the tsunami risk for False Pass is Relatively Moderate. According to the State of Alaska DHS&EM, False Pass has local tsunami potential and a medium risk of distant tsunami potential.<br>Most critical facilities and infrastructure in False Pass are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of False Pass is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Shishaldin.<br>Volcanic ashfall is the primary volcanic hazard that may impact False Pass. |
| Wildland Fire | Did not profile this hazard. | | |
| Dam Failure | 2- Possible | 3- Critical | False Pass has had historical vessel traffic related to the fishing and shipping industry, which has contributed to the spread of invasive species in the region. The entire natural area surrounding False Pass is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. False Pass's location adjacent to a busy coastal port is the primary human-caused pathway in the spread of invasive species in the region. |
| Invasive Species | Did not profile this hazard. | | |

### F.4.1.1 Changes in the Cryosphere- Sea Ice

#### F.4.1.1.1 Location

While sea ice is less common in the Aleutian Islands than farther north in the Bering Sea, affected locations include exposed coastlines around False Pass.

#### F.4.1.1.2 History

According to the Native Village of False Pass Planning Team, changing sea ice conditions impact marine travel, weather exposure, coastal processes, and access to subsistence resources.

#### F.4.1.1.3 Extent (Magnitude and Severity)

Sea ice runup has resulted in damage to the City Dock (Fuel Dock), pile, and navigation buoys in March/April 2026. This was reported by the Planning Team as a "30-year event".

Based on the extent of past changing sea ice events and the criteria identified in Table 5 of the Base Plan, the extent of changing sea ice in False Pass is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### F.4.1.1.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | According to the Native Village of False Pass Planning Team, changing sea ice conditions impact coastal processes. |
| Infrastructure | The Native Village of False Pass Planning Team reported that shoreline and harbor-area shoreline loss, which can be exacerbated by changing sea ice conditions, can threaten docks and waterfront utilities. |
| People | No specific previous impacts related to personal injury or death were reported by the Native Village of False Pass Planning Team. |
| Utilities | The Native Village of False Pass Planning Team reported that shoreline and harbor-area shoreline loss, which can be exacerbated by changing sea ice conditions, can threaten utilities especially near the waterfront. |
| Transportation | According to the Native Village of False Pass Planning Team, changing sea ice conditions impact marine travel, weather exposure, and access to subsistence resources. Shoreline and harbor-area land erosion, which can be exacerbated by changing sea ice conditions, can threaten roads and docks. |
| Economy | No specific previous impacts related to the local economy were reported by the Native Village of False Pass Planning Team. |
| Subsistence Resources | According to the Native Village of False Pass Planning Team, changing sea ice conditions impact access to subsistence resources. |

#### F.4.1.1.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that False Pass will experience an impactful sea ice change event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### F.4.1.1.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of sea ice hazards in Alaska. |
| Location | Future climate conditions are likely to influence the location of sea ice changes and associated hazards in Alaska by shifting the typical location of sea-ice loss northward and earlier in the season, resulting in longer periods of open water across the Bering Sea and reducing the likelihood that protective ice will form or persist near the Aleutians East Borough Planning Area. |
| Extent | Future climate conditions are likely to influence the extent of sea ice. The winter Bering Sea Ice cover continues to retreat as a long-term trend with year-to-year variability (State of Alaska DHS&EM 2023). |
| Impact | During the last several decades, Alaska has warmed twice as fast as the rest of the U.S. Sea ice and climate are intimately linked. An ice bench reduces wave development in the open ocean during winter months. Without an ice bench, waves can mechanically erode coastal beaches. Many villages are located along Alaska's coastline and are threatened by eroding shores.<br><br>Retreat of sea ice is anticipated to disrupt marine ecosystem, impact local communities where sea ice is important for subsistence or tourism, and contribute to increased storm surge, coastal flooding, and sediment deterioration and land destabilization (City of Cold Bay LHMP 2022). The presence of sea ice, which may continue to be highly variable from year to year despite a long-term downward trend, may cause delays to freight and damage to marine and coastal infrastructure. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of sea ice cover-related events, especially severe storms, in the Aleutians East Borough Planning Area. Due to the loss of winter sea ice and other factors including increased temperatures and precipitation, Alaska as a whole is projected to see a threefold increase in severe storms (State of Alaska DHS&EM, 2023). |
| Population Patterns | Future climate conditions may influence population patterns as they relate to sea ice hazards, as increased frequency and adverse impacts from severe storms could lead people to relocate from vulnerable coastal areas, or from the community entirely. |
| Land Use Development | Future climate conditions may influence land use development as it relates to sea ice hazards, as an increase in severe storms without sea ice protection could lead to changes in the location of certain land use development activities - such as areas slated for marine infrastructure, residential construction or waste management - that are vulnerable to these severe storms. |
| Subsistence Resources | Future climate conditions are expected to influence subsistence resources as they relate to sea ice hazards. Low winter sea ice extents, which have been seen in the Bering Sea in the last decade, affect the marine ecosystem that supports subsistence resources that are critical to AEB communities' ways of life. Some species are expected to shift northward, such as Pacific Cod. Migration patterns and timing for species including salmon, marine mammals, and subsistence waterfowl are also observed and expected in the future. |

### F.4.1.2 Changes in the Cryosphere- Snow Avalanche

The Native Village of False Pass Planning Team did not select this hazard to be profiled in the MJHMP Update.

Two landslides have been documented near False Pass, outside of City limits. These landslide events did not cause damage to any facilities or injuries/fatalities.

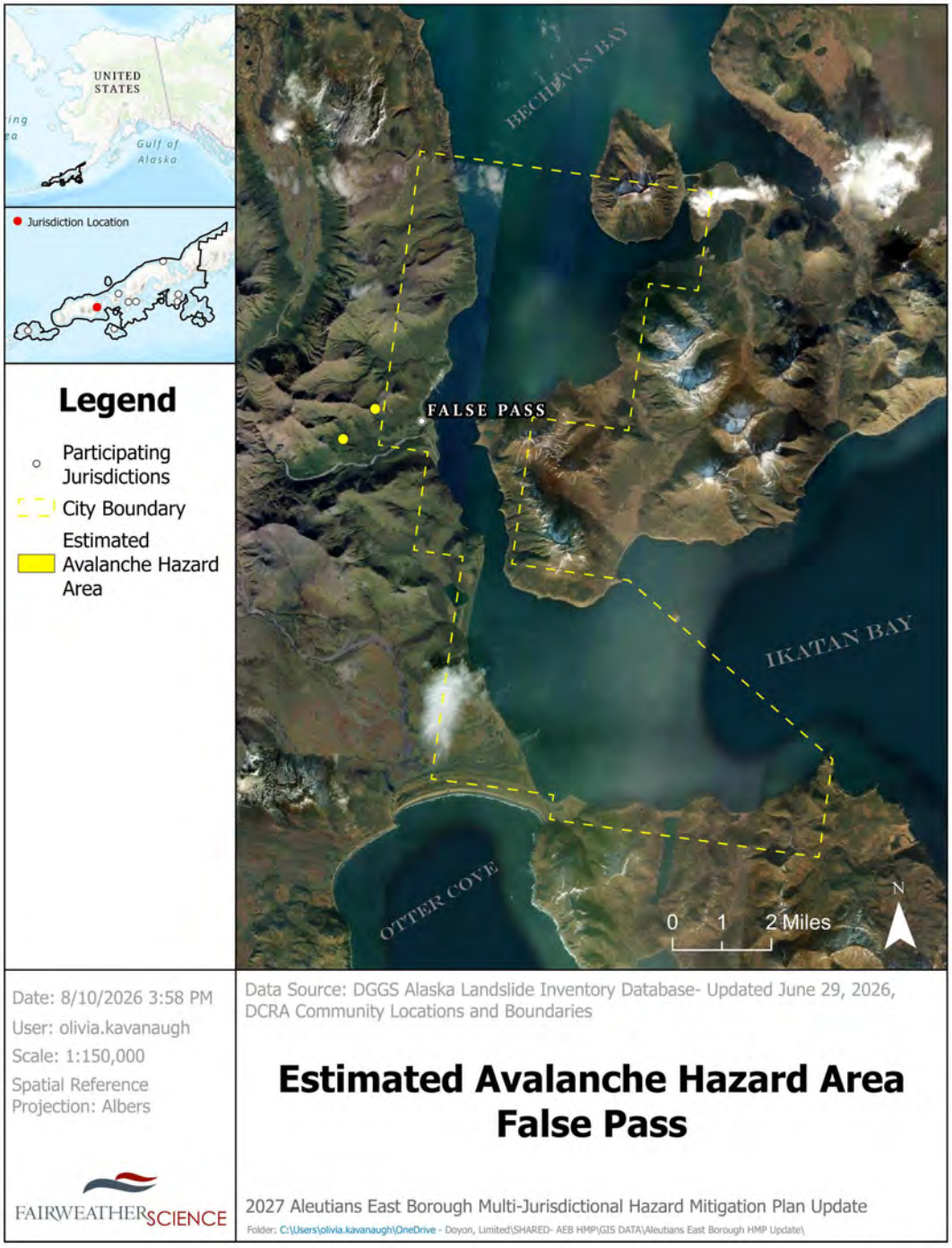



**Figure F-1- Estimated Avalanche Hazard Areas in False Pass**

### F.4.1.3 Dam Failure

#### F.4.1.3.1 Location

There is one dam in False Pass, the False Pass Water Dam, which is owned by the City.

Figure F-2 shows the location of the dam in False Pass as well as the potential inundation area if the dam were to fail.

As formal dam failure inundation mapping has not been completed for this dam, dam failure hazard areas in the community were identified by buffering the 1-mile downstream route by 0.1 miles (528 feet). This methodology does not account for site-specific topography or hydrology and may over or underestimate dam failure hazard areas in the community.

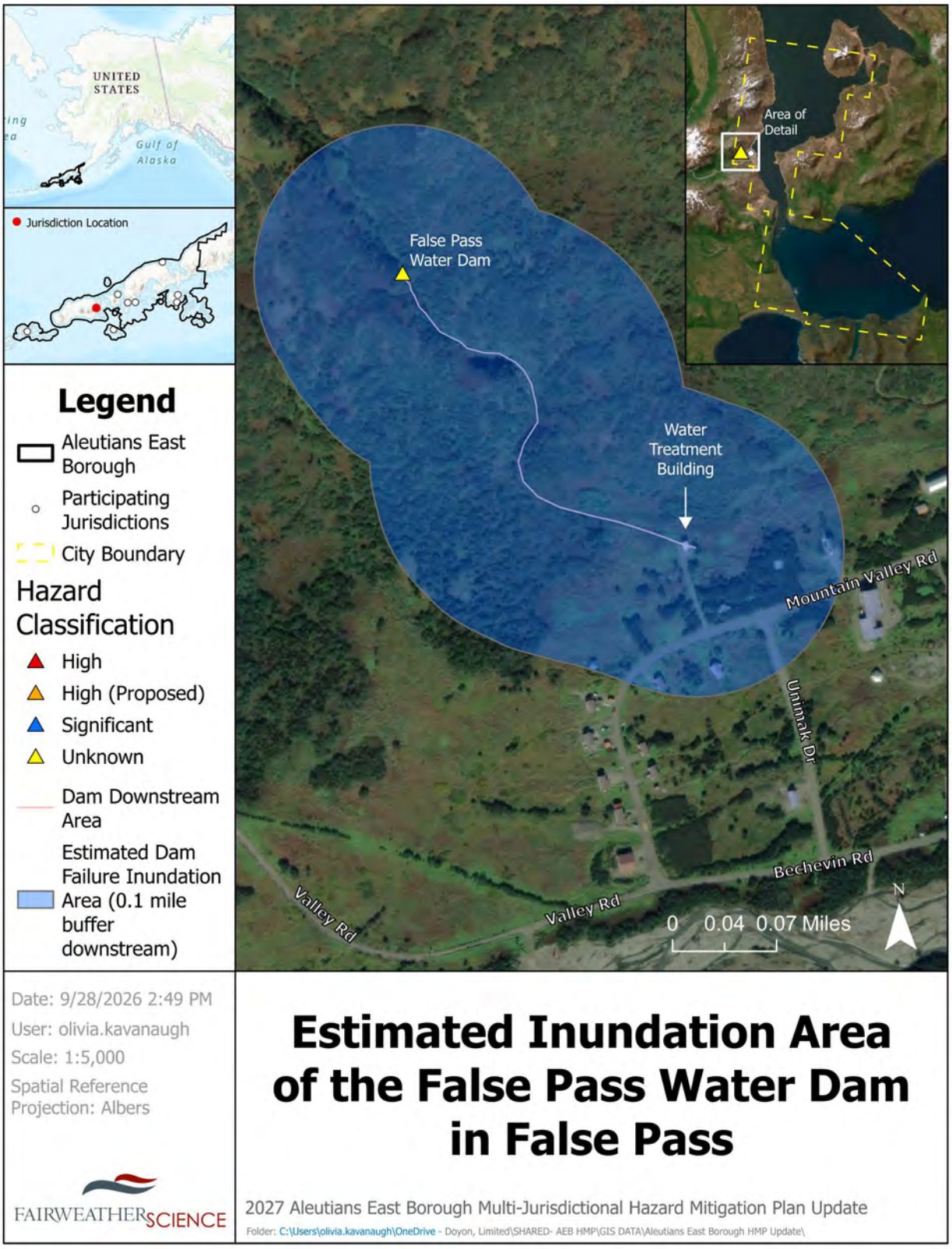



**Figure F-2- Estimated Inundation Area of the False Pass Water Dam**

| False Pass Water Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of False Pass |
| Year Built | Unknown |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | There is no information available about the inspection frequency of False Pass Water Dam. The last inspection was conducted on September 9, 2025. |
| Downstream Description | The dam outflow consists of a small, narrow outflow creek. |
| Downstream Area | The dam is located Northwest of False Pass, in low shrub habitat. The most recent inspection noted the access trail from the Water Pumphouse to the dam was engulfed by salmonberry bushes, cow parsnip, and alder trees. |
| Downstream Dams | There are no dams downstream of the False Pass Water Dam. |
| Downstream Bridges | There are no bridges downstream of False Pass Water Dam. |
| Reservoir Area | Unknown |
| Downstream Development | The Water Pumphouse is the first structure downstream of the dam, approximately 1 mile downstream. |
| General findings of the last inspection | While no definitive inspection rating was given to False Pass Water Dam during the 2025 inspection, all aspects of the dam where found to be in good condition with no observed defects or repair needs. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for False Pass Water Dam. |

Source: False Pass Planning Team, HDR 2025

#### F.4.1.3.1 History

There is no recorded history of dam failure in False Pass.

#### F.4.1.3.2 Extent (Magnitude and Severity)

Heavy rainfall, seismic activity, landslides, and flood events may affect the structural integrity of dams that would affect False Pass. Other natural hazards that are less predictable/ forecastable, like landslides or earthquakes, can also impact the structural integrity of dams and could lead to failure. Poor or infrequent maintenance, seismic activity, and severe weather can also weaken the integrity of a dam.

As formal dam failure inundation mapping has not been completed for the False Pass Water Dam, dam failure hazard areas in the community were identified by buffering the 1-mile downstream route by 0.1 miles (528 feet). This methodology does not account for site-specific topography or hydrology and may over or underestimate dam failure hazard areas in the community.

Based on this methodology, the only structure at risk of being impacted by a dam failure is the **Water Treatment Facility**, which is located about 1 mile downstream of the dam.

Based on the most recent condition assessments and the criteria identified in Table 5, the magnitude and severity of dam failure in False Pass is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks and more than 25% of property or critical infrastructure being severely damaged.

#### F.4.1.3.3 Impact

In False Pass, severe weather, flooding, landslide/ground failure events, or seismic activity could all bring enough rain and/or snowfall or topographic change to cause a dam failure. The age and conditions of the dam also pose a risk to the structural integrity of dams.

Dam failures result in impacts such as damage or destruction to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruption, and funding required to rehabilitate failed dams.

A dam failure will also cause secondary impacts to upstream and downstream flooding potential while the dam is not in operational order. Extreme precipitation events could impact drainages more severely than usual, due to space normally protected by the controlled release of a dam no longer afforded shielded from increased water flow.

A dam failure could generate a large and destructive flash flood downstream, depending on the size of the reservoir.

| | Description of Previous/Potential Impacts |
|---|---|
| Geography/Land | Due to a lack of historical dam failure events, there have not been any documented impacts to the geography or land in False Pass.<br>If a dam failure were to occur, the downstream area could experience rapid flooding, sediment deterioration, debris flows, and damage to infrastructure and property. Potential impacts would depend on the location, size, and condition of the dam, the volume of water released, and the characteristics of the downstream drainage area. |
| Infrastructure | Due to a lack of documented historical dam failure events, there have been no documented impacts to infrastructure within False Pass.<br>If a dam failure were to occur, the sudden release of water could damage or destroy downstream roads, bridges, culverts, utilities, water and wastewater systems, communications infrastructure, homes, and other critical facilities. Floodwater and debris could also block transportation routes and limit access to affected communities, potentially delaying emergency response and disrupting essential services.<br>Based on the methodology used to assess dam failure hazard areas in the community, the only structure at risk of being impacted by a dam failure is the Water Treatment Facility, which is located about 1 mile downstream of the dam. |
| People | Due to a lack of documented historical dam failure events, there have been no documented impacts to people within False Pass.<br>If a dam failure were to occur, the sudden release of water could create rapidly changing and potentially life-threatening flood conditions in downstream areas. Residents and people located near waterways or downstream areas could be exposed to flooding, debris, and dangerous water velocities. |
| Utilities | Due to a lack of documented historical dam failure events, there have been no documented impacts to utility systems within False Pass.<br>If a dam failure were to occur, flooding and debris could damage or disrupt electrical systems, water and wastewater facilities, fuel storage and distribution systems, communications infrastructure, and other essential utilities located downstream. |

| | Description of Previous/Potential Impacts |
|---|---|
| | Damage to utility systems could result in power outages, interruptions to water and wastewater services, loss of communications, and disruption of other essential services. |
| Transportation | Due to a lack of documented historical dam failure events, there have been no documented impacts to transportation infrastructure within False Pass.<br>If a dam failure were to occur, rapidly moving water, flooding, and debris could damage or wash out roads, bridges, culverts, and other transportation infrastructure located downstream. Flooding could also affect airport access, runways, taxiways, and associated facilities, potentially disrupting air service to and from affected communities. |
| Economy | Due to a lack of documented historical dam failure events, there have been no documented economic impacts from dam failure within False Pass.<br>If a dam failure were to occur, flooding and damage to infrastructure could disrupt local businesses, commercial activities, fisheries, transportation, and other economic activities. Damage to roads, airports, utilities, facilities, and equipment could result in costly repairs, business interruptions, supply delays, and temporary loss of income. |
| Subsistence Resources | Due to a lack of documented historical dam failure events, there have been no documented impacts from dam failure to subsistence areas or resources within False Pass.<br>If a dam failure were to occur, sudden flooding, sediment deterioration, and debris could affect streams, wetlands, shorelines, and other areas used for subsistence activities. Floodwater could damage or alter fish and wildlife habitat, affect water quality, and disrupt access to hunting, fishing, gathering, and other traditional subsistence areas. |

#### F.4.1.3.4 Probability of Future Events

According to the Alaska Dam Safety Program:

> *Dam owners conduct routine monitoring and inspection of dams within the state on the previously identified schedule, with priority placed on those dams which pose the greatest potential threat. However, to fully determine the probability of a future event, a full engineering inspection would need to be completed on each dam, something beyond the scope of this program. The majority of these more thorough inspections are conducted by an independent agency hired by the dam owner, FERC, or the USACE.*
>
> *Dams undergoing repair and/or reconstruction are required to be designed to pass at least the 1%-annual-chance rainfall event with one foot of freeboard. The most critical and hazardous dams are required to meet a spillway design standard much higher than passing the runoff from a 1%-annual-chance rainfall event. Although not all the dams have been shown to withstand the 1%-annual-chance rainfall event, most of the dams meet this standard due to original design requirements or recent spillway upgrades.*

The probability for dam failure reduces when the dam is properly maintained and receives a “Satisfactory” condition rating.

Based on the criteria listed in Table 5 of the Base Plan, and the most recent condition assessments (if available), it is **Possible** that False Pass will experience a dam failure event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year. Failure depends on loading conditions (existing condition, precipitation, seismic, deferred maintenance, etc.).

However, the State of Alaska Dam Safety Engineer warned of “condition creep”, where observational assessments of AEB dams have rated dams more poorly than their most recent available condition rating. If

False Pass Water Dam continues to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### F.4.1.3.5 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in False Pass. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in False Pass. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in False Pass. A potential outcome of changing climate in Alaska is an increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in False Pass. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in False Pass. Increased precipitation and frequency of severe weather events could contribute to more stress on the dam in False pass. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in False Pass as residents may relocate in and out of potential future inundation areas. Residents of False Pass may also relocate out of area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in False Pass. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in False Pass.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes.

### F.4.1.4 Earthquake

#### F.4.1.4.1 Location

The entire geography of False Pass is vulnerable to earthquakes, due to its location on the Alaska-Aleutian subduction zone.

According to the 2023 State of Alaska HMP, False Pass is located in an area with the potential of **Severe** perceived shaking from earthquakes (PGA 34 – 65). Perceiving shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. This map focuses on the actual variations in shaking intensity across a region as felt by people and structures.

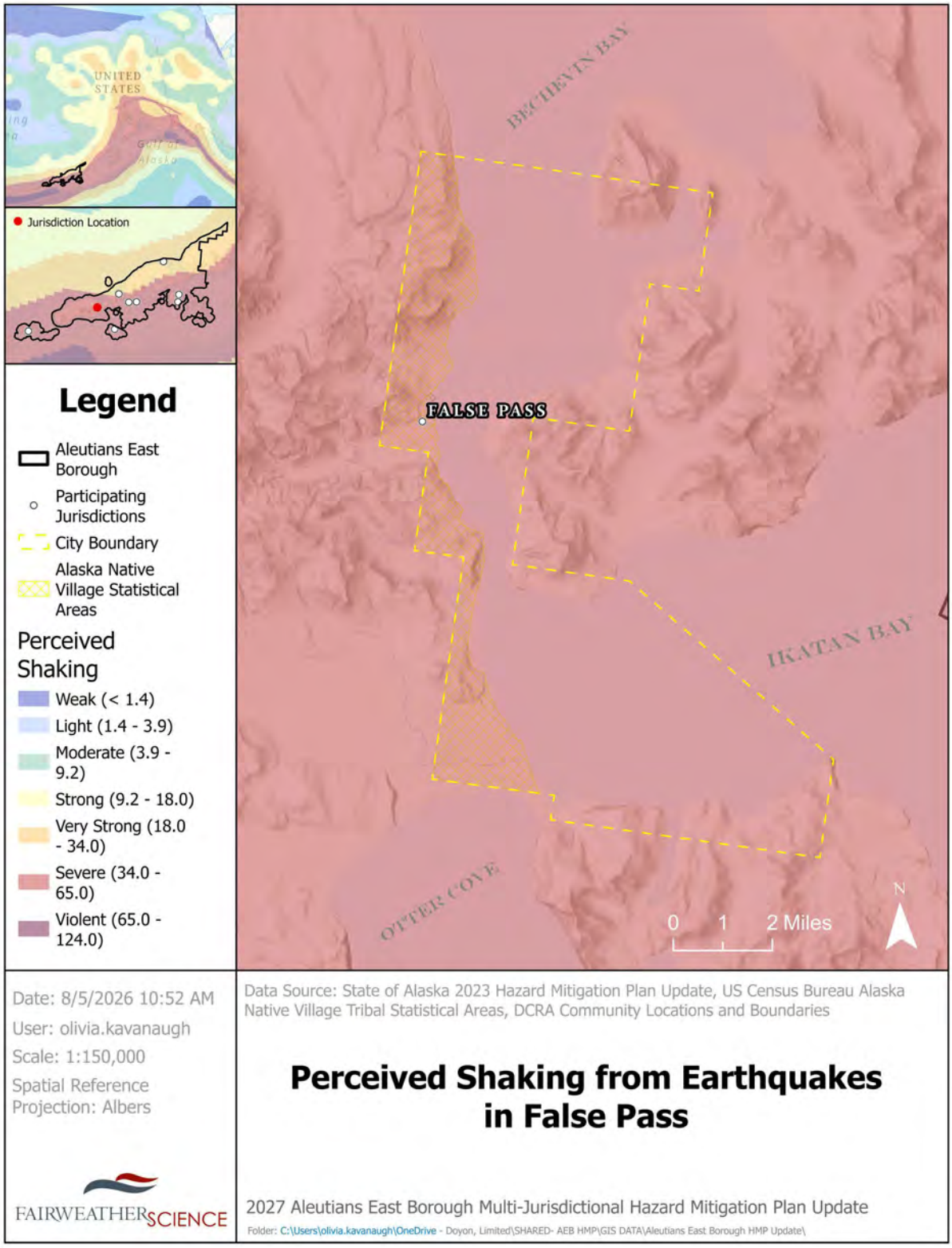



**Figure F-3 - Perceived Shaking from Earthquakes in False Pass**

#### F.4.1.4.2 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including False Pass can be found in Table 11 of the Base Plan.

#### F.4.1.4.3 Extent (Magnitude and Severity)

Thousands of earthquakes occur each year along the Aleutian chain. Strong shaking has occurred historically in False Pass and can damage infrastructure and trigger tsunamis.

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. These range in magnitude from less than 3.0 to 6.0 and greater. Based off this data, the area surrounding False Pass experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Based on the extent of past earthquakes events and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in False Pass is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### F.4.1.4.4 Impact

| Description of Impacts | |
|---|---|
| Geography/Land | There have been no recorded earthquake impacts on the geography or land in False Pass. An earthquake has the potential to trigger landslides, open cracks in the earth, and change the shoreline. |
| Infrastructure | While shaking has been perceived in False Pass, no reports of damage to buildings have been reported. A large earthquake could crack foundations and roadways and flatten buildings and other structures in the case of extremely severe earthquakes. |
| People | No injuries or fatalities due to earthquakes have been reported in False Pass. Injuries or fatalities are possible due to falling debris. |
| Utilities | There are no recorded impacts on utility systems due to earthquakes in False Pass. Earthquakes can damage sewer and water lines, and down telephone poles. |
| Transportation | There is no recorded transportation system impacts due to earthquakes in False Pass. In the future, earthquakes could damage roadways or airport runways, limit road and air travel, or cause a tsunami that could damage boat harbors and other water travel infrastructure. |
| Economy | There are no recorded economic impacts due to earthquakes in False Pass. |
| Subsistence Resources | There is no recorded earthquake caused impacts on subsistence resources in False Pass. |

#### F.4.1.4.5 Probability of Future Events

False Pass is located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing False Pass.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that False Pass will experience an earthquake of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### F.4.1.4.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | The characteristics and nature of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Location | The location of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Extent | The extent of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Impact | The impact of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales (Alaska DHS&EM 2023). |
| Probability of Future Events | The probability of future earthquake events is not affected by changing climate conditions and is not expected to change on human timescales (Alaska DHS&EM 2023). |
| Population Patterns | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, population patterns in False Pass are not expected to be affected. |
| Land Use Development | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, land use development in False Pass is not expected to be affected. |
| Subsistence Resources | As changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, subsistence resources in False Pass are not expected to be affected. |

### F.8.1.5 Flood

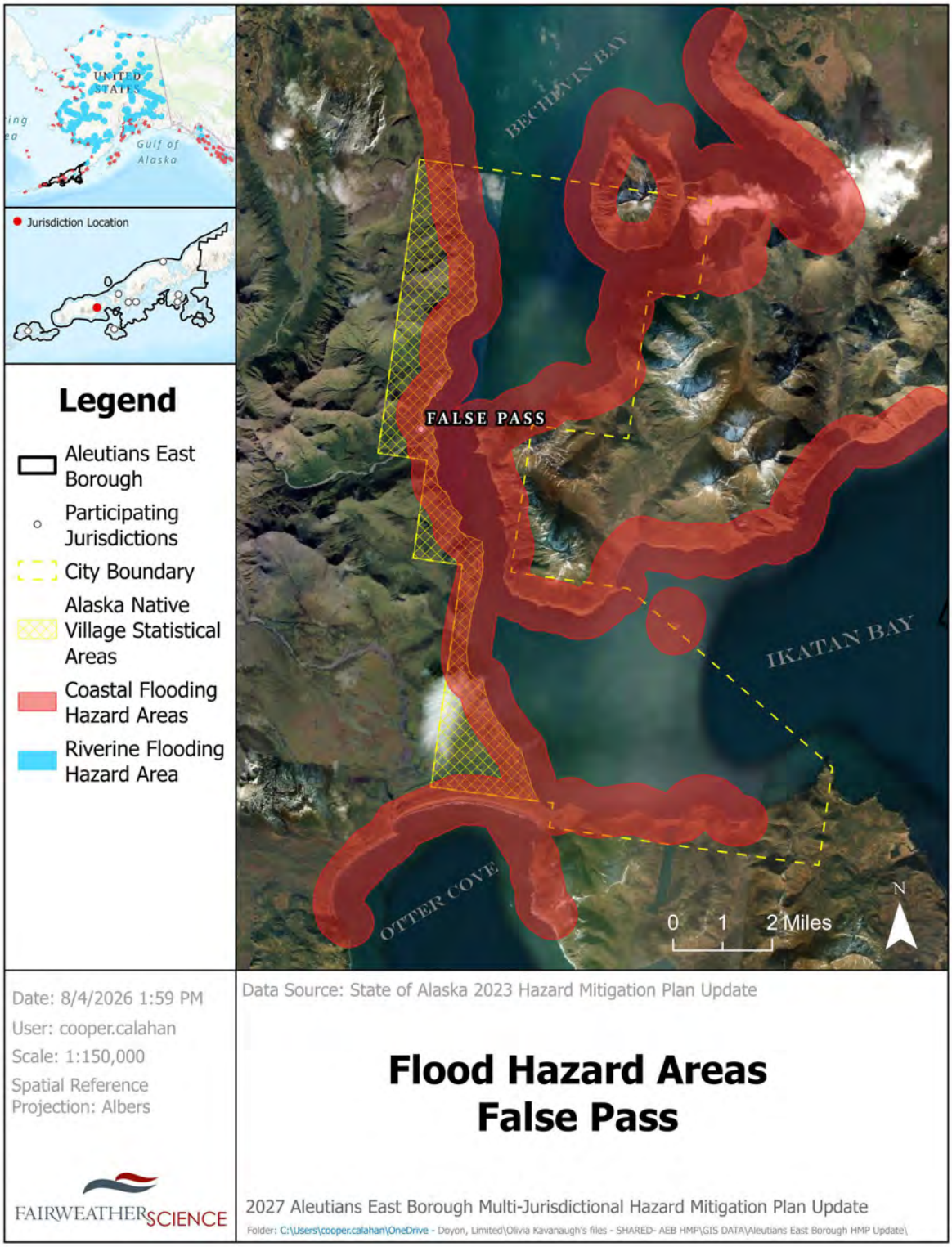
The Native Village of False Pass Planning Team reports that they experience storm surge, king tides, snowmelt flooding, and rainfall run-off flooding events.

#### F.8.1.5.1 Location

According to the 2023 State HMP, False Pass is within the identified Coastal Flooding Hazard Area (Figure F-4). The State of Alaska identifies coastal flooding hazard areas of 0.5 miles from the coastline (DHS&EM 2023).

The Native Village of False Pass Planning Team reports that flooding impacts shoreline and low-lying areas in False Pass. The Planning Team also reports that rainfall runoff impacts the landfill access road and other transportation routes in False Pass.

False Pass experiences flooding by the airport and the Mountain Valley subdivision.




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure F-4- False Pass Flood Hazard Areas**

#### F.8.1.5.2 History

In 2020, Road Top Creek flooded onto private land and washed-out foundations, the carpenter's shop with machinery, and warehouse on Peter Pan-owned land. In 2021, residents stated that water floods the road to the Mountain Valley subdivision a few times each year.

Floods in False Pass are a result of the 100-year discharge for the unnamed creek known locally as Round Top Creek. Past events have required the use of heavy equipment to divert flooding from the creek to an adjacent stream. The highest remembered flows in Round Top Creek occurred in the fall of 1963, December 1984, and November 1985. The flood of 1963 eroded through the middle of the newly constructed runway, but no reports of water entering the community were reported.

#### F.8.1.5.3 Extent (Magnitude and Severity)

Flooding has resulted in several inches of flood waters in False Pass.

The 2019 Denali Commission *Statewide Threat Assessment: Identification of Threats from Erosion, Flooding, and Thawing Permafrost in Remote Alaska Communities* identified False Pass and Nelson Lagoon as "threatened" communities based on the results of the USACE's Alaska Baseline Erosion Assessment, completed in 2009.

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest (number 63) has the lowest vulnerability.

Of these 187 communities, False Pass received a flood threat ranking of 56 out of 63 communities. While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking for flood threat. False Pass ranked 75 overall (out of 187 communities) for the combined erosion, flooding, and thawing permafrost threat. Some communities received the same ranking, indicating equal threat rankings.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding in False Pass is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### F.8.1.5.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Native Village of False Pass Planning Team did not report any specific previous geography/land impacts related to flooding in False Pass. |
| Infrastructure | In 2020, Road Top Creek flooded onto private land and washed-out foundations, the carpenter's shop with machinery, and warehouse on Peter Pan-owned land. In 2021, residents stated that water floods the road to the Mountain Valley subdivision a few times each year. |
| People | The Native Village of False Pass Planning Team did not report any specific previous personal injury or death related to flooding in False Pass. |
| Utilities | The Native Village of False Pass Planning Team did not report any specific utility outages or damage related to flooding in False Pass. |
| Transportation | In 2021, residents stated that water floods the road to the Mountain Valley subdivision a few times each year. The flood of 1963 eroded through the middle of the newly constructed runway, but no reports of water entering the community were reported. |
| Economy | No specific previous impacts related to the local economy were reported due to flooding by the Native Village of False Pass Planning Team. |

| | Description of Impact |
|---|---|
| Subsistence Resources | The Native Village of False Pass Planning Team did not report any specific previous subsistence resource impacts related to flooding in False Pass. |

#### F.8.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that False Pass will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### F.8.1.5.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in the Planning Area as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in the Planning Area is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in the Planning Area, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in the Planning Area. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021).<br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in the Planning Area, |

| Description of Future Conditions | |
|---|---|
| | however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |
| Population Patterns | It is possible that future flood events will cause changes in population patterns in the Planning Area as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### F.8.1.6 Ground Failure/Landslide

#### F.8.1.6.1 Location

False Pass is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity.

Many landslide paths coincide with avalanche paths, especially at higher elevations. Unmapped areas within the Borough remain to be studied for landslide hazards and will be included in future updates of this plan as resources become available to evaluate those areas for landslide hazards.

As landslide hazard areas are not well defined in the community and detailed terrain data, such as LiDAR, were not available, ArcGIS Pro basemaps, including satellite imagery, topographic maps, and terrain data, were used to identify mountainous areas, elevation, and observable slope characteristics.

Potential landslide hazard areas were manually delineated based on these features (Figure F-5). Where available, photographs of the surrounding geography were also reviewed to confirm the presence of steep slopes and other terrain characteristics indicative of potential landslide hazard.

***This assessment is intended to identify potential areas of landslide hazard at a planning level. It is not a substitute for site-specific landslide hazard mapping, geotechnical investigations, or detailed evaluation of local topography, and site-specific conditions. Areas identified through this assessment should be considered preliminary and should be subject to further investigation where development or other activities may be exposed to landslide hazards.***

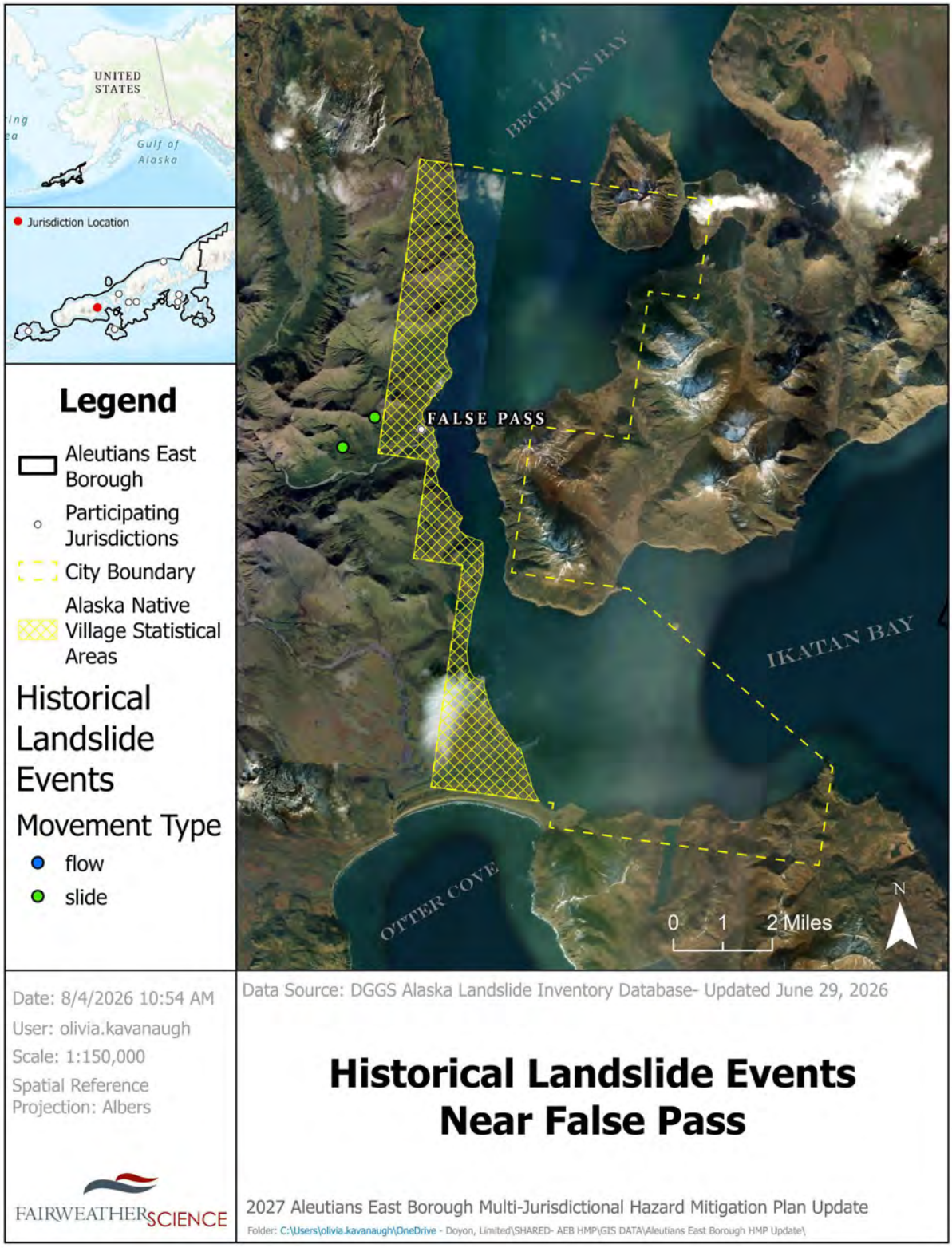



**Figure F-5 - Historic Landslide Events Near False Pass**

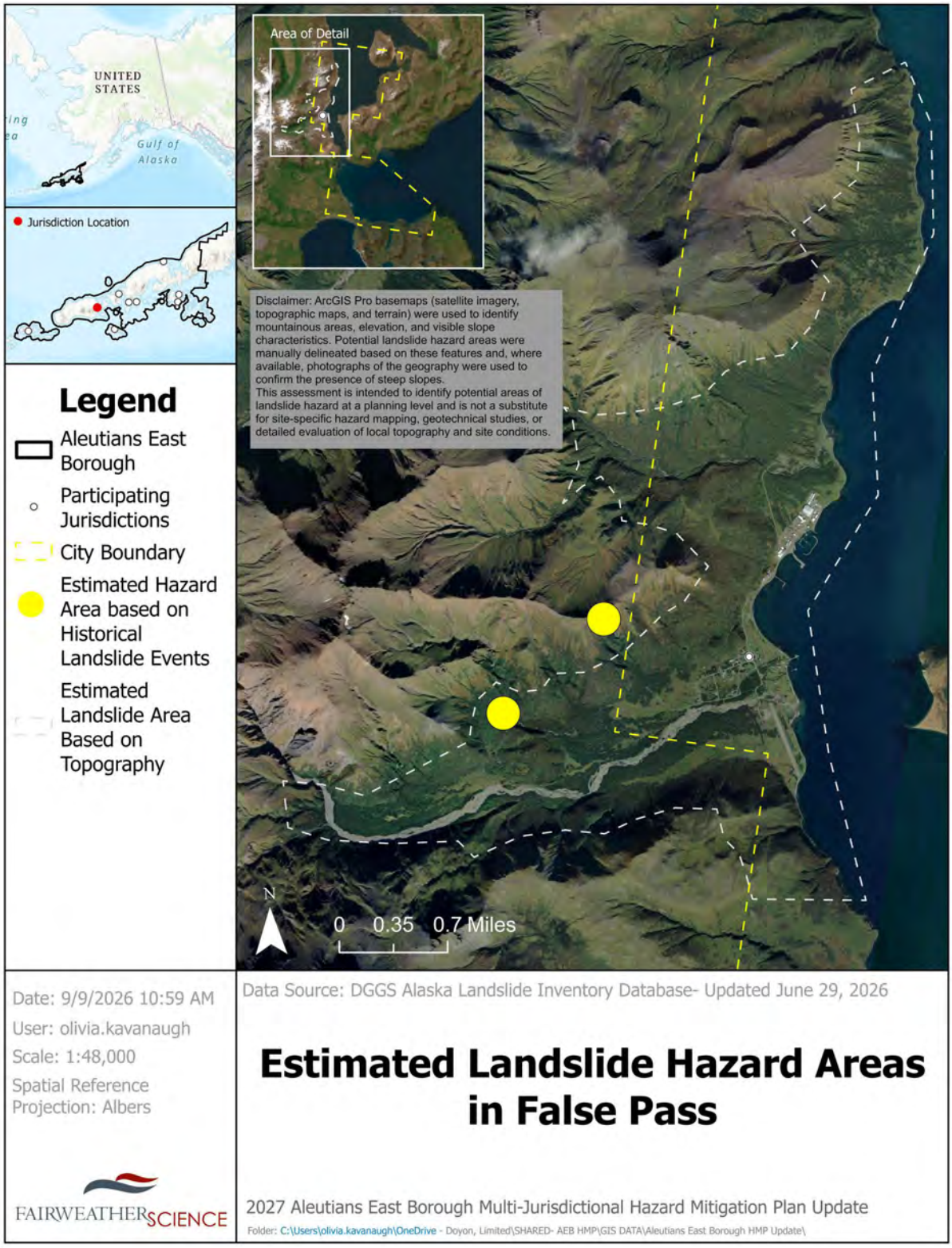



**Figure F-6- Estimated Landslide Hazard Areas in False Pass**

#### F.8.1.6.2 History

There have been two (2) recorded subaerial landslides near False Pass. The Alaska Landslide Inventory Database does not provide any additional information other than that they were classified as landslides and not debris flows.

The April 1st, 1946, earthquake near Unimak Island (approximately 42 m east of Akutan, 35 miles west of Cold Bay and 45 miles east of King Cove) created a tsunami wave that reached all the way to Antarctica. For years, speculation existed that the large tsunami was aided by a submarine landslide due to the disproportionate waves created by the earthquake. In 1996, the USGS GLORIA discovered numerous slope failures (historic submarine landslides) along the eastern Aleutian Shelf. An exceptionally large failure was found at the location of the now named Ugamak Slide (Fryer, Watts, Patson 2004). The Ugamak Slide consists of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

If the Ugamak Slide did indeed occur on April 1st, 1946, it is likely that much of the seismic motion, especially at longer periods, was from the slide itself. A tectonic shock – a shallow subduction earthquake – was probably the trigger but differentiating it from the rest of the motion may prove impossible. The evidence for a landslide source to the 1946 tsunami is substantial (Fryer, Watts, Patson 2004).

#### F.8.1.6.3 Extent (Magnitude and Severity)

Damage from ground failure or landslides ranges from minor with minimal repairs required to a massive economic impact with the possible destruction of critical community infrastructure and potential loss of human life.

Subaerial landslides on sloped terrain in False Pass pose a threat to critical facilities or human life. Subaerial landslides near bodies of water also pose a threat to critical facilities or human life in False Pass as they may trigger a tsunami or seiche.

A landslide (both submarine and subaerial) can trigger a tsunami. Due to False Pass's location between the Bering Sea and the Pacific Ocean, and exposure to the open ocean, a submarine landslide-induced tsunami affecting the Planning Area in the future is a possibility. In the past, a submarine landslide created secondary hazards (tsunamis), that have impacted False Pass.

Based on the Alaska Landslide Inventory Database, it can be estimated that the historical landslides recorded in False Pass range in width of less than 100 feet to over 500 feet.

The largest discovered underwater landslide deposit in the Aleutians East Borough is the Ugamak Submarine Slide. The Ugamak Submarine Slide consisted of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

Based on the extent of past landslide events and the criteria identified in Table 5 of the Base Plan, the extent of landslides in False Pass is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### F.8.1.6.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | Two recorded landslides have impacted near the jurisdiction; however, they were not near any critical facilities. Future landslides could damage steep hillsides, making them more prone to land destabilization, avalanches, and further landslides. |
| Infrastructure | There has not been any recorded impact on infrastructure in False Pass. Landslides can move structures off their foundation, damage walls and roofs, and cover or damage roadways and airport runways. |

| | Description of Impacts |
|---|---|
| People | There have been no recorded injuries or fatalities due to landslides in False Pass. Landslides can injure or kill people due to debris and soil flowing or burying people. |
| Utilities | There have been no recorded landslide impacts on utilities in False Pass. Landslides could damage sewer, water, and utility lines by moving earth downhill. |
| Transportation | There have been no recorded landslide impacts on transportation systems in False Pass. Road and air travel could be halted or delayed due to landslides damaging or covering the infrastructure. A submarine landslide could create a tsunami or seiche that damages boat harbors or other marine infrastructure, limiting water travel. |
| Economy | There have been no economic impacts due to landslides recorded in False Pass. |
| Subsistence Resources | There have been no recorded landslide impacts to subsistence resources. |

#### F.8.1.6.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that False Pass will experience a landslide event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### F.8.1.6.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of landslides in False Pass in the future. |
| Location | It is possible that future climate conditions will influence the location of future landslides in False Pass. Landslide probability is location specific, and numerous variables must be considered. It is common for debris flows to recur in the same channel or to shift slightly. Other types of landslides may reoccur in the same place or the area directly adjacent to a previous landslide. False Pass is in a highly seismic area, which can trigger landslides at any time, and create areas prone to landslides that did not used to be.<br>Ground failures related to more frequent severe weather events, an increase in atmospheric rivers, and potential droughts are expected to appear in locations that were previously frozen and are now thawing. This includes areas that are immediately adjacent to recently thawed ground and where overlying vegetation has been removed. However, landslides also occur in areas with no prior known instabilities due to changing conditions such as increased rainfall, strong earthquake shaking, and human activities (DHS&EM 2023). |
| Extent (Magnitude and Severity) | It is likely that future climate conditions will influence the magnitude of future landslides in False Pass. Landslides are expected to increase in magnitude with increased areas of effect as severe weather events increase in frequency (IPCC 2019).<br>Future climate conditions are expected to increase landslide frequency of all intensities, and as people develop across the landscape, including into hazardous areas, there will likely be an increase in more significant outcomes in the future (DHS&EM 2023). |

| Description of Future Conditions | |
|---|---|
| Impact | It is likely that future climate conditions will influence the impact of future landslides in False Pass. Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from an increase in atmospheric rivers, severe weather events, and glacial decline (IPCC 2019), which could increase future ground failure events and resultant impacts. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of future landslides in False Pass. Although the probability of ground failure is location-specific, it is likely, and increasing, due to a changing climate. Severe weather events such as precipitation and wind are a direct result of atmospheric warming. Atmospheric rivers are becoming increasingly common and increase the intensity and duration of precipitation events at regional and local scales. Landslide events are directly related to high intensity precipitation events, and those are likely to become more common over greater geographic regions of Alaska (DHS&EM 2023). |
| Population Patterns | It is possible future climate conditions will influence population patterns in False Pass. Since 2020, the population has remained stable, with the population fluctuating greatly during seasonal fishing season (US Census 2026). This may eventually mean more of the resident population living in landslide hazard areas, however an increased growing season due to future climate conditions could lengthen the tourist season. An increase in tourists throughout the year could possibly increase the number of people that are at risk of landslide hazards at any given moment. |
| Land Use Development | It is possible future climate conditions will influence future land use development in False Pass. Limiting development and relocating existing development outside of landslide hazard areas would change the development in these areas. A landslide warning system could require infrastructure development, and more development outside of the landslide zones could increase land use to accommodate displaced residents. It is also possible that land developed in the future, or that has already been developed, may eventually become prone to landslide hazards. |
| Subsistence Resources | It is possible that future climate conditions will result in landslides impacting subsistence resources. Landslides could wipe out land access to certain parts of coastline, berry gathering locations, or trails leading to hunting or fishing grounds. |

### F.8.1.7 Invasive Species

The Native Village of False Pass did not select this hazard to be profiled in the MJHMP Update.

### F.8.1.8 Sediment Deterioration and Land Destabilization

#### F.8.1.8.1 Location

Sediment deterioration and land destabilization can occur throughout False Pass, with coastal and riverine sediment deterioration and land destabilization being the biggest concerns for the community.

Since False Pass is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surges, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.

#### F.8.1.8.2 History

The history of coastal sediment deterioration and land destabilization in False Pass varies by location due to the localized nature of storms in the community. Most recorded impacts from sediment deterioration and land destabilization in False Pass is related to riverine sediment deterioration and land destabilization. Since 2000, the south side of the riverbank within False Pass has deteriorated significantly, with the destabilization within 100 feet of the airport bridge. Sediment deterioration and land destabilization has also had a history of impacting the area surrounding the FAA pad in False Pass, with the destabilization area creeping closer to the pad on an annual basis.

#### F.8.1.8.3 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of land destabilization vary throughout select communities. In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk. False Pass was categorized in erosion Group 2, which places it at a moderate risk of land destabilization according to the study.

Over the last 25 years, the south side of the riverbank has lost ~100 feet and the shoreline is within 100 feet of the bridge. To the north, the riverbank has lost about 10 to 20 feet. There is noticeable sediment deterioration within 50 feet of the FAA Pad, which is also causing concern for the electric utility generator building.

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the extent of sediment deterioration and land destabilization in False Pass is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### F.8.1.8.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding False Pass has been damages to shoreline and beaches, particularly along areas exposed to waves and storms. Sediment deterioration is leading to shoreline loss of 10-100 feet in False Pass. |
| Infrastructure | While infrastructure has not been impacted from sediment deterioration and land destabilization in False Pass, the City of False Pass Planning Team is concerned about shoreline loss near the FAA Pad potentially affecting the electric utility generator building, as well as encroaching shoreline loss near the bridge. |
| People | Sediment deterioration and land destabilization have not resulted in injuries or fatalities to the residents of False Pass. |

| Description of Impact | |
|---|---|
| Utilities | While utilities have not been impacted from sediment deterioration and land destabilization in False Pass, the community is concerned about shoreline loss near the FAA Pad potentially affecting the electric utility generator building. |
| Transportation | While transportation has not been impacted from sediment deterioration and land destabilization in False Pass, in the last 25 years, the south side of riverbank has lost ~100 feet and the shoreline is within 100 feet of the bridge, which could cause future transportation disruptions in the community. |
| Economy | There are a substantial number of roads and trails in False Pass that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities. |
| Subsistence Resources | Sediment deterioration and land destabilization has not impacted subsistence resources in False Pass. |

#### F.8.1.8.5 Probability of Future Events

The low-lying geography influences the likelihood of continued sediment deterioration and land destabilization in False Pass.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is Likely that **False Pass** will experience a sediment deterioration and land destabilization event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### F.8.1.8.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in False Pass. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in False Pass. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal land destabilization in False Pass (AK DGGS 2026). |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in False Pass. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in False Pass. Projected increases in precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in False Pass. Although the probability for land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |

| Description of Future Conditions | |
|---|---|
| Population Patterns | It is possible future climate conditions will influence population patterns in False Pass. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of False Pass entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in False Pass. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in False Pass. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

### F.8.1.9 Severe Weather

The Native Village of Fase Pass Planning Team reports that False Pass experiences high winds, freezing rain/ice storms, and extreme cold.

#### F.8.1.9.1 Location

Severe weather events can impact the entirety of False Pass.

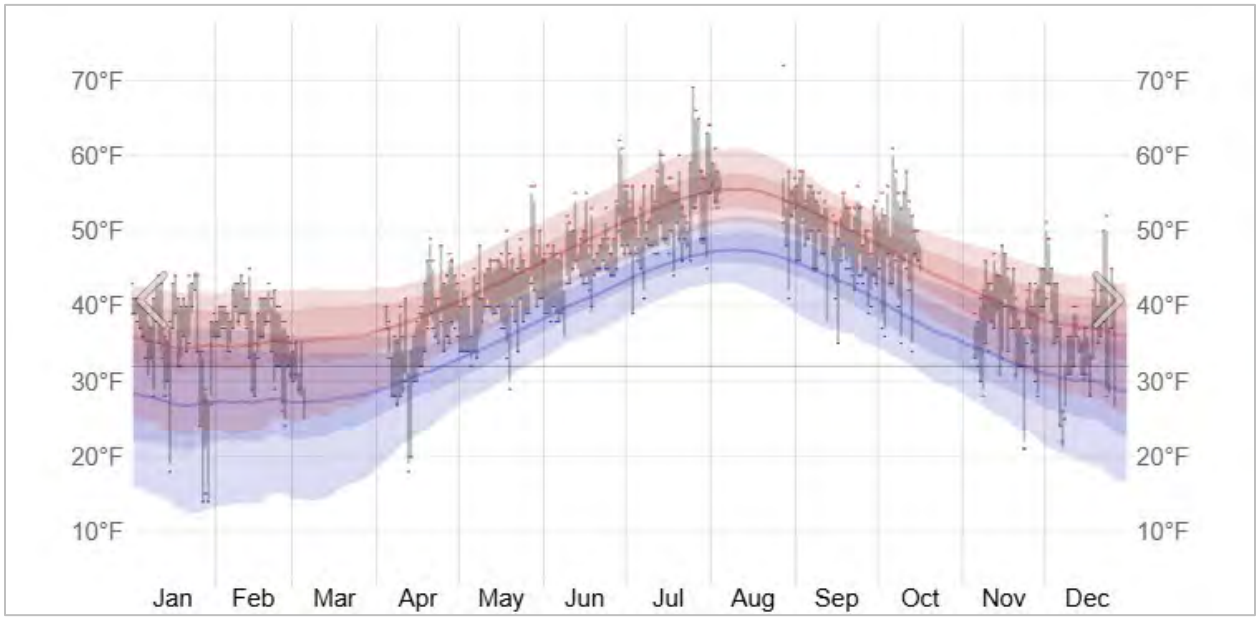
#### F.8.1.9.2 History

On April 7, 2011, a destructive storm caused extensive damage in False Pass. 100mph winds collapsed buildings and blew part of a roof off a home. According to False Pass City Clerk Chris Emrich, the public safety building roof was partially blown off, and the medical clinic windows were blown out. The doors to the ambulance bay were halfway ripped off. Siding was torn off the village public safety officer's house. The wind flipped a 4-wheel vehicle over and pushed it about 30 feet down the road. Windows were blown out in several homes. Several buildings completely collapsed, including older vacant houses (AEB 2011).

Gale warnings and small craft advisories are not uncommon in False Pass. On October 21, 2024, a powerful storm struck Alaska's west coast. On November 1, 2024, a gale warning and small craft advisory were still in effect for the Bering Sea at False Pass (Alaska DOT 2024).

#### F.8.1.9.3 Extent (Magnitude and Severity)

The figure below shows the daily range of reported temperatures (gray bars) and 24-hour highs (red ticks) and lows (blue ticks). The daily average high is indicated by the red line, and the low is indicated by the blue line.




Source: Weather Spark 2026

**Figure F-7- False Pass Airport Temperature History, 2024**

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather in False Pass considered **Critical,** with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### F.8.1.9.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team did not report specific previous geography/land impacts because of severe weather events in False Pass. |
| Infrastructure | The Planning Team reports that high winds damage roofs and siding. Ice can damage electrical and communications infrastructure.<br><br>On April 7, 2011, a destructive storm caused extensive damage in False Pass. 100mph winds collapsed buildings and blew part of a roof off a home. According to False Pass City Clerk Chris Emrich, the public safety building roof was partially blown off, and the medical clinic windows were blown out. The doors to the ambulance bay were halfway ripped off. Siding was torn off the village public safety officer's house. The wind flipped a 4-wheel vehicle over and pushed it about 30 feet down the road. Windows were blown out in several homes. Several buildings completely collapsed, including older vacant houses. |
| People | The Planning Team reports that high winds create blowing debris hazards. No specific personal injury or death was reported due to severe weather. The Planning Team also reports that isolation occurs when transportation is delayed due to extreme cold or other severe weather events. |
| Utilities | The Planning Team reports that high winds disrupt power and communications. Cold conditions increase the risk of frozen water systems, mechanical failures, and heating interruptions. |
| Transportation | The Planning Team reports that high winds can restrict air and marine travel. Other severe weather events also impact transportation in and out of the community. |
| Economy | No specific previous impacts related to the local economy were reported by the Native Village of False Pass Planning Team. |
| Subsistence Resources | The Planning Team did not report specific previous subsistence resource impacts because of severe weather events in False Pass. |

#### F.8.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that False Pass will experience a severe weather event (dense fog, extreme cold, heavy rain, heavy snow, or high winds), within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### F.8.1.9.6 Future Climate Conditions

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in False Pass. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in False Pass. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in False Pass. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in False Pass. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in False Pass. | It is unlikely that future climate conditions will influence the nature of future high wind events in False Pass. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in False Pass. | It is possible that future climate conditions will influence the location of future drought/water supply events in False Pass. | It is unlikely that future climate conditions will influence the location of future extreme cold events in False Pass. | It is unlikely that future climate conditions will influence the location of future heavy rain events in False Pass. | It is unlikely that future climate conditions will influence the location of future heavy snow events in False Pass. | It is unlikely that future climate conditions will influence the location of future high wind events in False Pass. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in False Pass could increase (UAF/SNAP 2025). | In False Pass, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Spring temperatures are projected to increase the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026).<br>Climate changes within Alaska are likely to result increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In False Pass, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Spring temperatures are projected to increase the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in False Pass. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP).<br>Extreme precipitation events have occurred throughout Alaska with increasing frequency.<br>In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In False Pass, climate models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>In False Pass experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months.<br>Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). |
| Impact | Projected increases in precipitation and associated moisture availability in False Pass could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026).<br>Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in False Pass are projected to increase, with estimated spring temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities in the Aleutians East Borough (Alaska DHS&EM 2023). | While overall temperature trends in False Pass are projected to increase, with estimated annual temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In False Pass, models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026).<br>As precipitation increases, impacts associated with heavy rainfall (localized flooding, landslide potential, roadway washouts, etc.) will increase. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | levels.<br>The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in False Pass by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in False Pass are projected to increase; with estimated winter temperature increases of approximately +7°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In False Pass, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+25%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in False Pass are projected to increase, with estimated spring temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In False Pass, spring is likely to have more precipitation (UAF/SNAP 2026).<br>Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in False Pass may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in False Pass have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in False Pass. | Future conditions of drought are not anticipated to significantly affect population patterns in False Pass. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in False Pass. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | It is not likely that future conditions influencing heavy rain will impact changes in False Pass population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in False Pass population patterns. | It is not likely that future conditions influencing high winds will impact changes in False Pass population patterns. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in False Pass. | Future conditions of drought are not anticipated to substantially affect future land use development in False Pass. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in False Pass, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in False Pass population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in False Pass land use development. | It is not likely that future conditions of high winds will impact changes in False Pass population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in False Pass. | Future conditions of drought may affect subsistence resources in False Pass, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | Future conditions of extreme cold may affect subsistence resources in False Pass, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | It is possible that future conditions of heavy rain will impact changes in False Pass land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above In False Pass, leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to development of landslide | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, | It is not likely that future conditions of high winds will impact changes in False Pass land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | monitoring equipment and/or landslide barriers/diversion structures. | thermal stress, and nutrient availability for subsistence species. | |

**Projected Conditions for False Pass (Isanaẋ)**

In False Pass (Isanaẋ), average annual temperatures may increase by about 9°F by the end of the century.

Spring temperatures are projected to increase the most (+9°F).

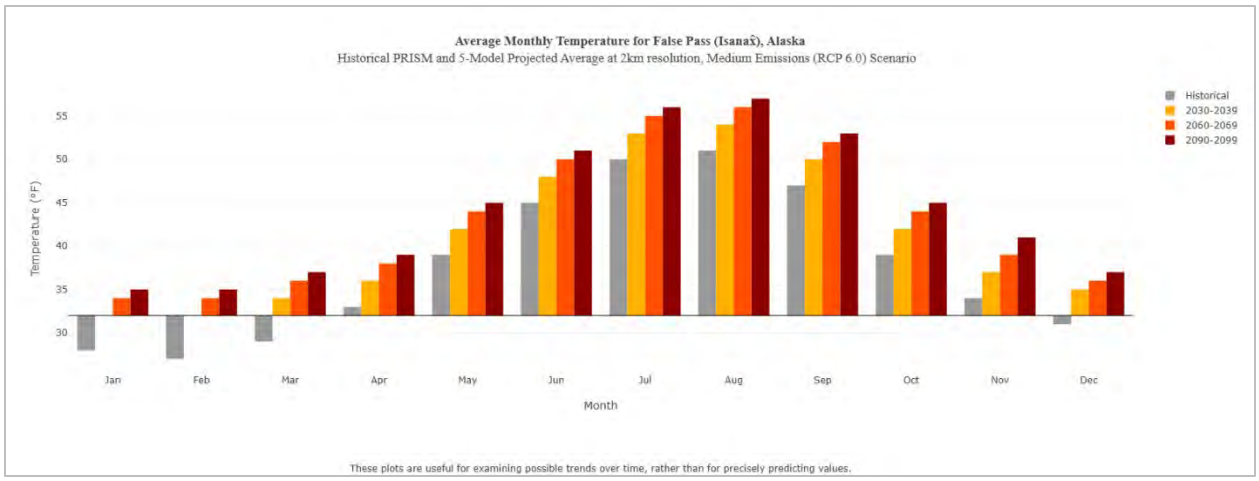
Winter may transition from below freezing to above freezing in the future.

Models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+24%).

In the past, this area had very low flammability. Future flammability may be about the same.

*Source: UAF/SNAP- Northern Climate Reports*

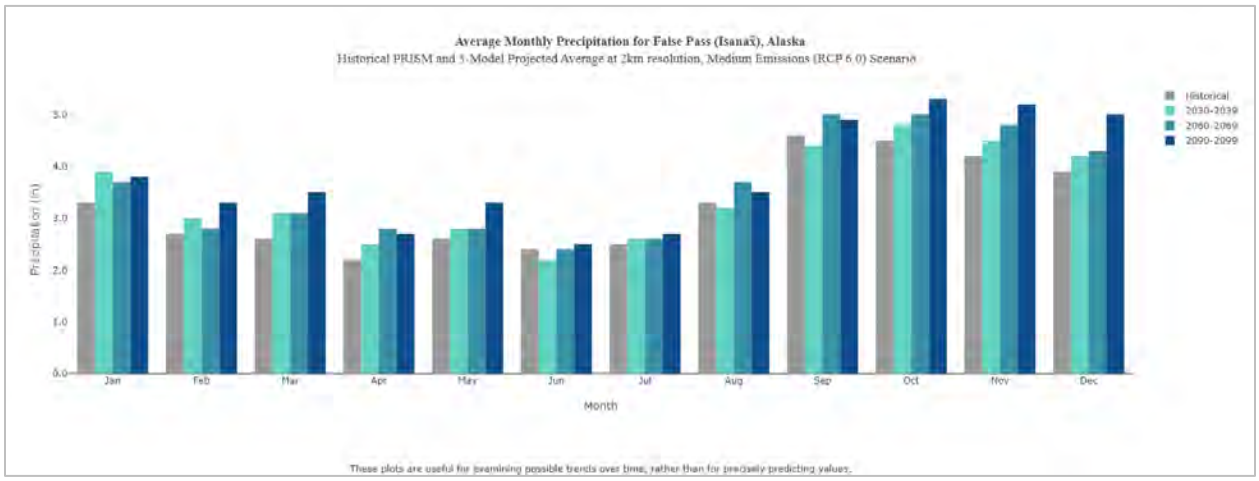
Figure F-8 models historical and future average monthly temperatures in False Pass from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure F-8- Historical and Future Projected Average Monthly Temperature in False Pass (1980-2099)**

Figure F-9 models historical and future average monthly precipitation in Nelson Lagoon from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure F-9- Historical and Future Projected Average Monthly Precipitation in False Pass (1980-2099)**

### F.8.1.10 Tsunami

#### F.8.1.10.1 Location

Most critical facilities and infrastructure in False Pass are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community (Figure F-10).

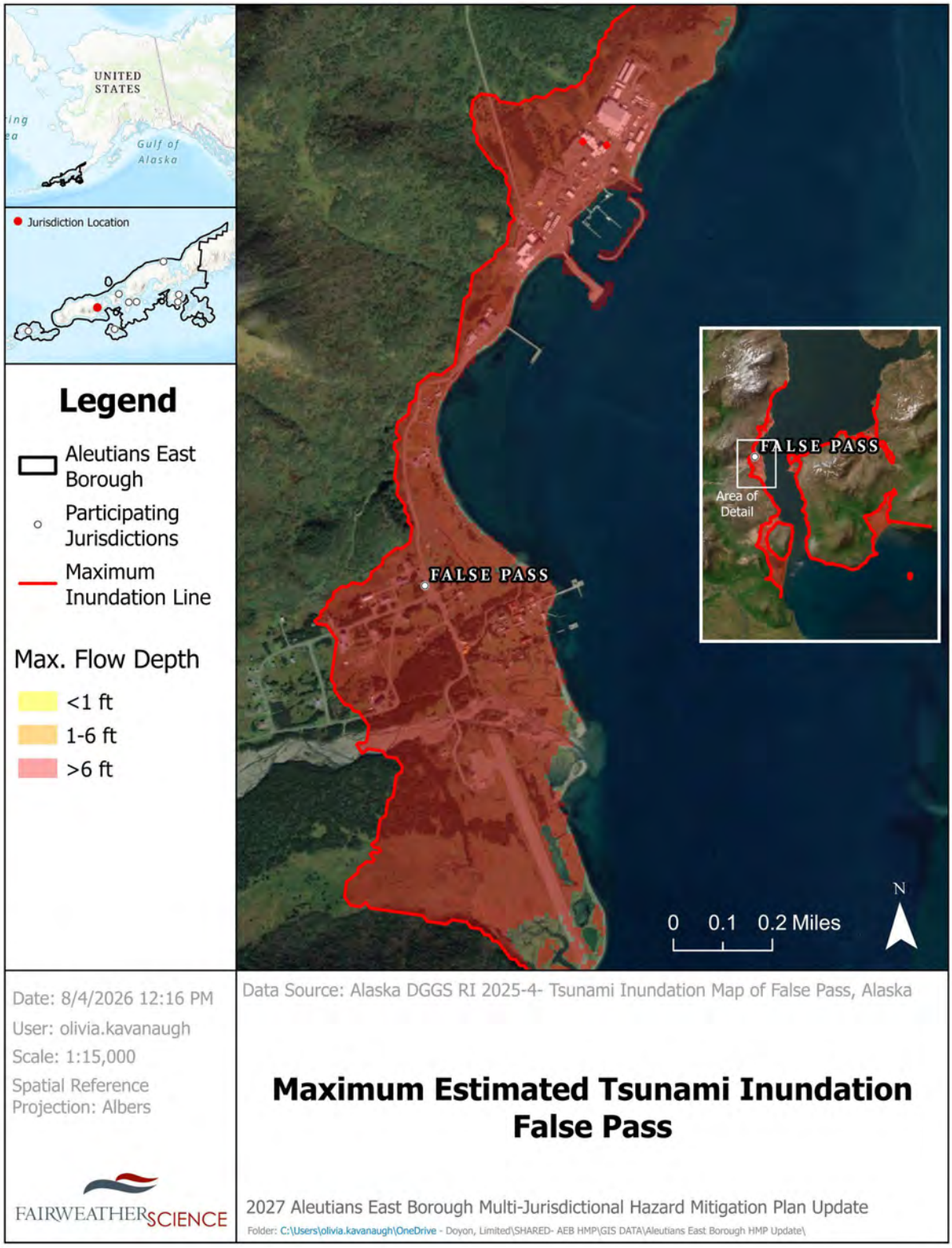



**Figure F-10- Maximum Estimated Tsunami Inundation, False Pass**

### F.8.1.10.2 History

False Pass is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust.

Since 1788, there have been 3 documented tsunami runup events in False Pass (Table F-1 and Figure F-12); however, none of these runup events were recorded near the population center. All events were recorded near the southern edge of the City boundary, not near any infrastructure or residential population.

**Table F-1- Tsunami Runups Events in False Pass (1788 - August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 12 | 1946-04-01 | IKATAN (AKUTAN), AK | EQ + LS | 8.6 | Unknown |
| 20 | 1946-04-01 | IKATAN, UNIMAK IS, AK | EQ + LS | 8.6 | 21.98 |
| 21 | 1946-04-01 | IKATAN, UNIMAK IS, AK | EQ + LS | 8.6 | 24.93 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

**April 1946 Aleutian Islands Earthquake and Tsunami**

The 1946 Aleutian Islands earthquake and tsunami struck on April 1, 1946, triggered by a powerful magnitude 8.6 undersea earthquake in the Aleutian Trench off Unimak Island, Alaska, which sent devastating Pacific-wide waves that resulted in a handful of deaths in Alaska and 159 deaths in Hilo, Hawaii.

The tsunami completely obliterated the steel-reinforced concrete Scotch Cap Lighthouse on Unimak Island (in the Aleutians East Borough, approximately 60 miles east of Akutan) and killed all five Coast Guard keepers (National Coast Guard Museum 2024).

Tsunami run-up of nearly 25 feet was recorded in False Pass, near the southern edge of the City boundary, not near any infrastructure or residential population.



Source: National Coast Guard Museum 2024

**Figure F-11- Scotch Cap Lighthouse: Before and After the 1946 Tsunami**

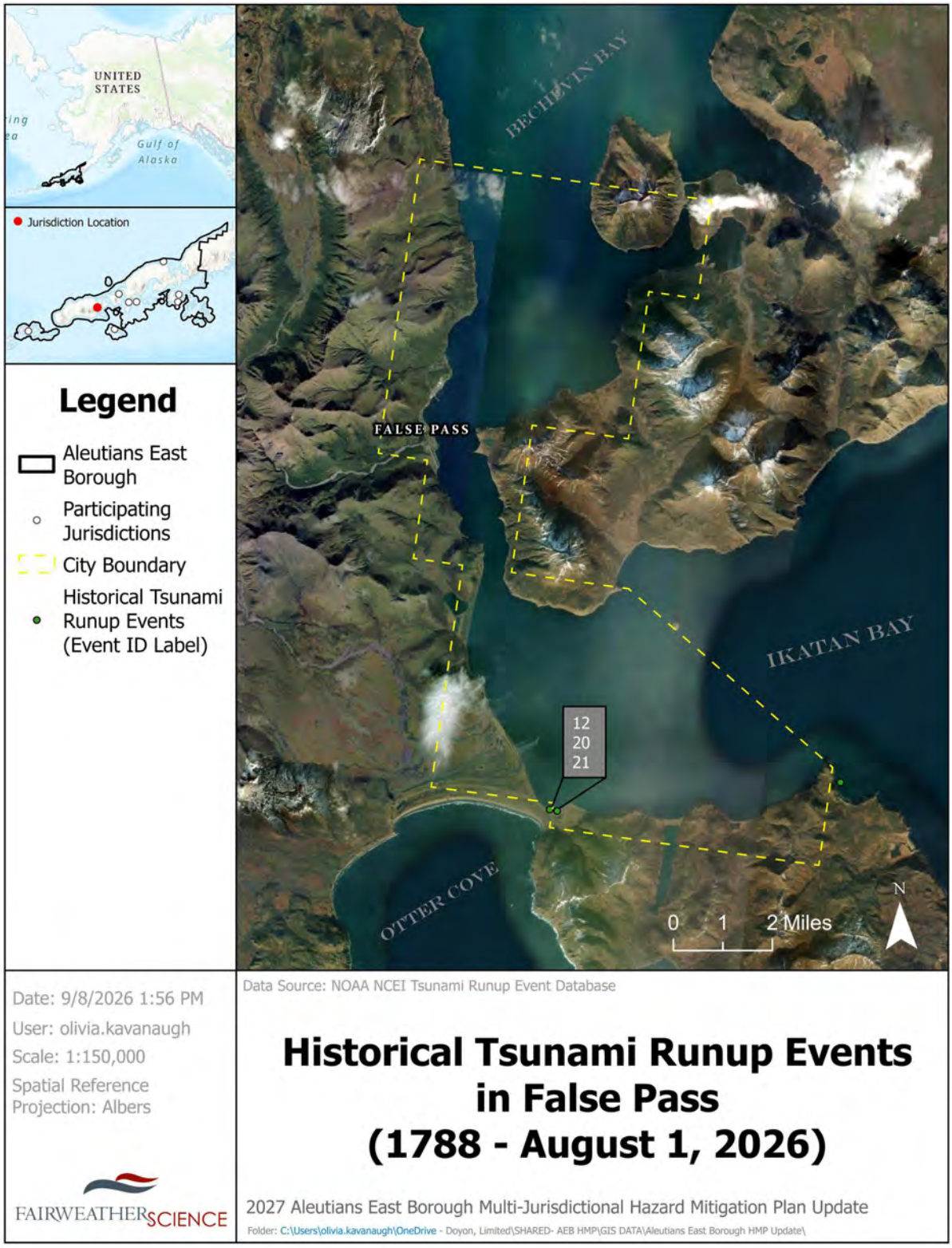



**Figure F-12- Historical Tsunami Runup Events in False Pass (1788 – August 1, 2026)**

#### F.8.1.10.3 Extent (Magnitude and Severity)

Areas within False Pass have experienced historical tsunami run up events from less than 10 feet to over 20 feet; however, none of these events impacted the population center of False Pass.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in False Pass is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### F.8.1.10.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | While False Pass is located in a tsunami-prone region, there is little evidence that historical tsunamis have reshaped the community's overall landscape.<br>Historical tsunami events have resulted in runup events over 20 feet in an uninhabited area of False Pass. |
| Infrastructure | Historical tsunami events have not impacted infrastructure in False Pass. Critical facilities at risk of tsunami inundation include the Airport Lease Building, Tribal Council Warehouse/Grocery Store, Store, Silver Bay Seafoods Processing Plant, Isanotski Cemetery, City Park Playground, Isanotski Green House, Library & Post Office, False Pass School, Public Safety Building, City Office & Recreation Center, City Shop, Health Clinic, Airport Runway, ADOT&PF Grader Shed, City Dock, Boat Ramp, Cargo Handling Area, Hoblet Harbor, Cargo Pier, Electric Generator Building, and Fuel Farm. |
| People | Historical tsunami events have resulted in tsunami warnings and local evacuations in False Pass but have not resulted in any injuries or fatalities. |
| Utilities | There are no documented reports of historical tsunamis causing significant damage to utility infrastructure in False Pass, including its electrical, water, wastewater, or communications systems. Future tsunamis could damage utility infrastructure, which could result in prolonged service disruptions and outages. |
| Transportation | Historically, there are no documented reports of tsunamis causing significant damage to transportation infrastructure in False Pass. A significant tsunami could inundate some roadways to and from the airport and in an extreme event potentially inundate the runway and airport infrastructure from the south. Aircraft taking off or landing on the water (floatplanes) could be impacted directly by a significant wave causing damage to aircraft and people onboard the aircraft. |
| Economy | There have been no recorded instances of a tsunami impacting the community's economy in False Pass. |
| Subsistence Resources | There have been no recorded instances of a tsunami impacting the community's access to subsistence resources in False Pass. |

#### F.8.1.10.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that False Pass will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

### F.8.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in False Pass is not anticipated to change in the future. |
| Location | The location of tsunami events in False Pass is not anticipated to change in the future. All low-lying coastal areas in False Pass will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in False Pass. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in False Pass. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in False Pass. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in False Pass, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in False Pass could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in False Pass, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in False Pass, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area. Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in False Pass. |

### F.8.1.11 Volcano

#### F.8.1.11.1 Location

The entire geography of False Pass is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Shishaldin.

According to the 2023 State of Alaska HMP, False Pass is located in a **moderate** volcanic ash hazard level area.

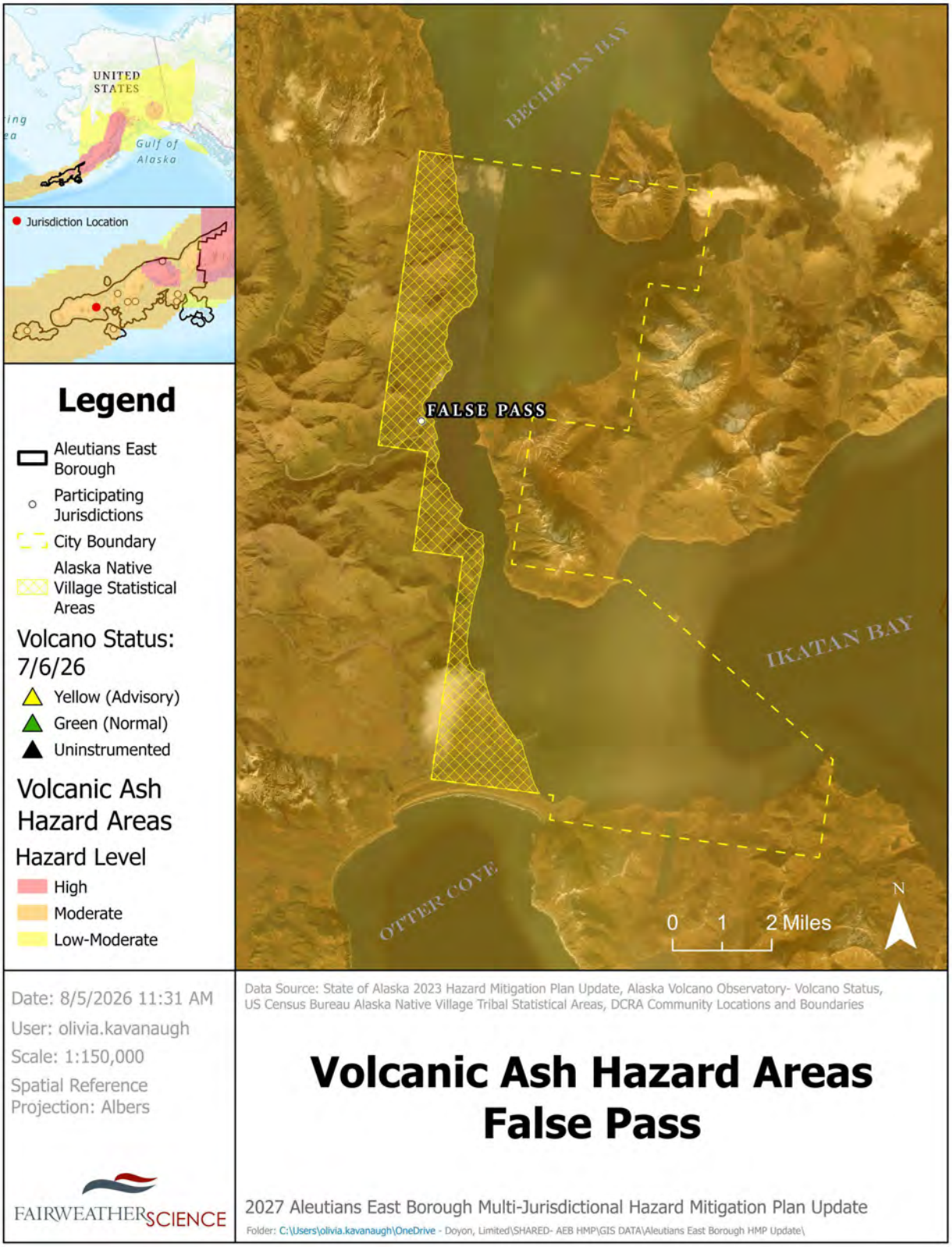



**Figure F-13 – False Pass Volcanic Hazard Areas**

### F.8.1.11.2 History

False Pass has had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to False Pass is **Mount Shishaldin**, which has resulted in several eruptions that has impacted the AEB, including False Pass. Located approximately 23 miles west of False Pass, Shishaldin has erupted a total of 24 times since 1900. In 2023, an eruption from Shishaldin resulted in False Pass experiencing volcanic ashfall for several months.

**Mount Westdahl** is a volcano that is located 55 miles west of False Pass. While not as recently active as Shishaldin, the 1991 eruption of Westdahl resulted in the smell of sulfur and light ashfall being reported by residents in False Pass.

### F.8.1.11.3 Extent (Magnitude and Severity)

False Pass is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Shishaldin, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, False Pass has been impacted by a volcanic ashfall event on approximately 5 occasions, with the majority resulting in trace to light ashfall in the community. The notable exception occurred in 1946, when an eruption from Shishaldin impacted False Pass with over 2 inches of ash covering the community (AVO 2026).

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcanoes in False Pass is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

### F.8.1.11.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding False Pass has been ashfall. While most of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposits (USGS 2015). |
| Infrastructure | The historical ashfall reported in False Pass has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of False Pass from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. |
| Utilities | While most historical volcanic eruptions impacting False Pass have not resulted in significant utility disruptions, reports from the 1946 Mount Shishaldin eruption indicated that the eruption caused electrical disturbances in the community. |
| Transportation | The primary transportation related impact from a volcanic eruption in False Pass is aircraft interruptions. There have been no reports of a volcanic eruption resulting in the closure of the False Pass airport. |
| Economy | The primary economic related impact from a volcanic eruption in False Pass is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations. |
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in False Pass that has impacted the community's access to subsistence resources. |

### F.8.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact False Pass.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 7, it is **Highly Likely** that False Pass will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### F.8.1.11.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in False Pass. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in False Pass. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in False Pass. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in False Pass. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in False Pass. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in False Pass. |
| Land Use Development | Future climate conditions are not expected to influence land use development in False Pass. |
| Subsistence Resources | Future climate conditions are not expected to influence False Pass's ability to access subsistence resources. |

### F.8.1.12 Wildland Fire

The Native Village of False Pass Planning Team did not select this hazard to be profiled in the MJHMP Update.

False Pass is located in an area with Very Low to Low Wildfire Exposure Risk (Figure F-14). Due to lack of available fuels and lack of historical events, the Native Village of False Pass Planning Team is not concerned about the community's wildfire risk.

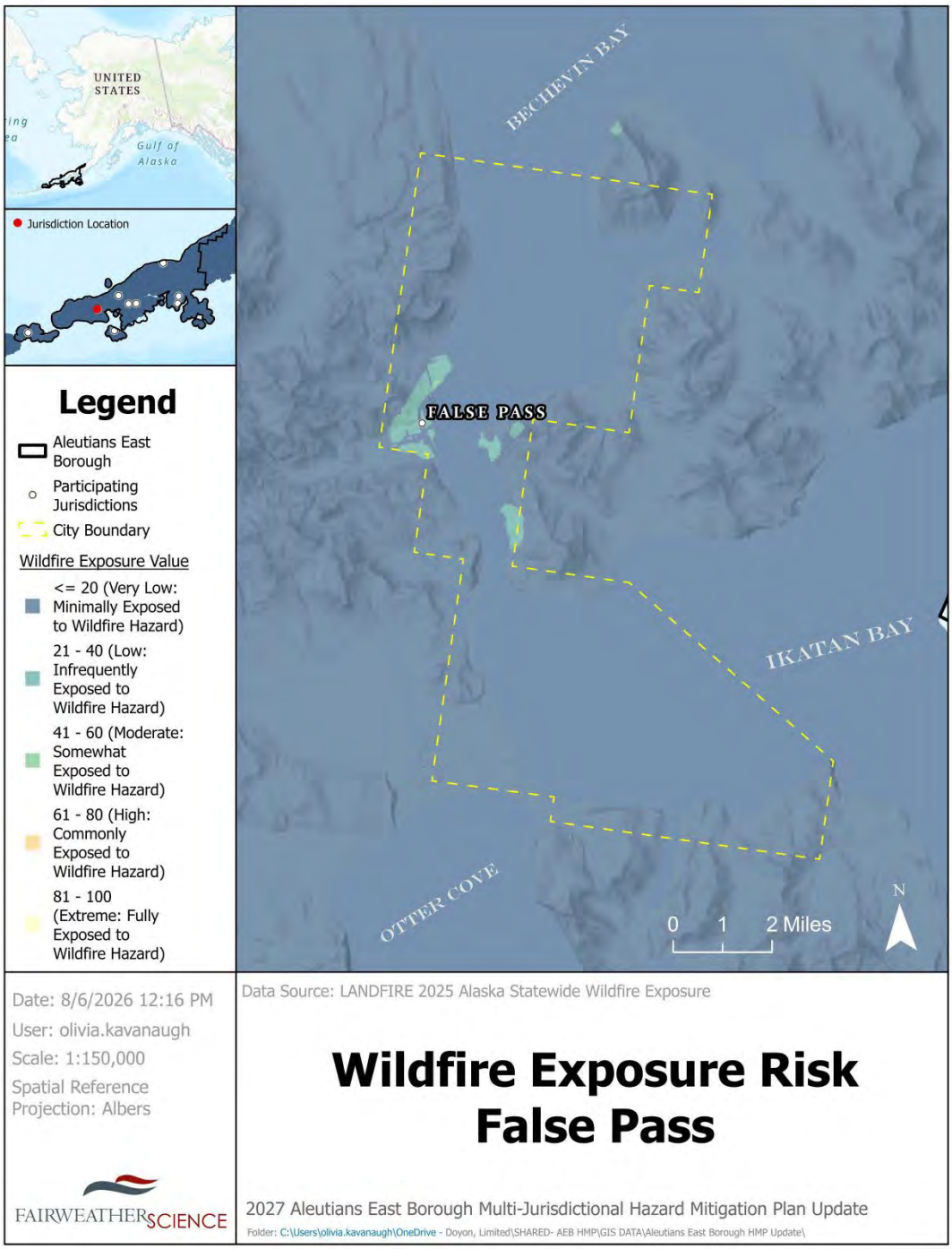
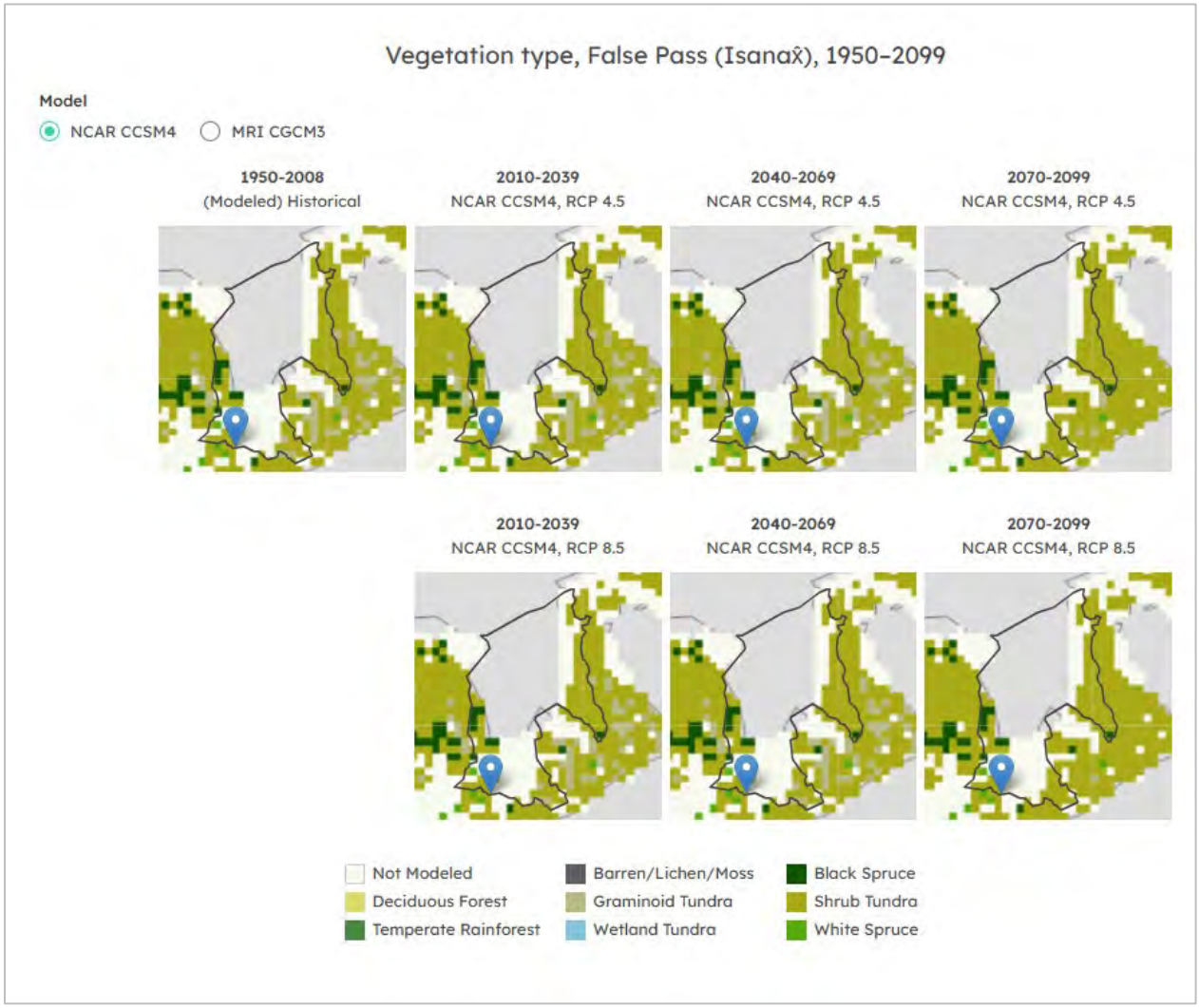



**Figure F-14- False Pass Wildfire Exposure Risk**

Vegetation Type: In False Pass, the predominant vegetation types are currently Shrub Tundra, Graminoid Tundra, and Black Spruce (UAF/SNAP 2026). Figure F-15 shows the projected changes in the location of vegetation in False Pass from 1950 through year 2099.

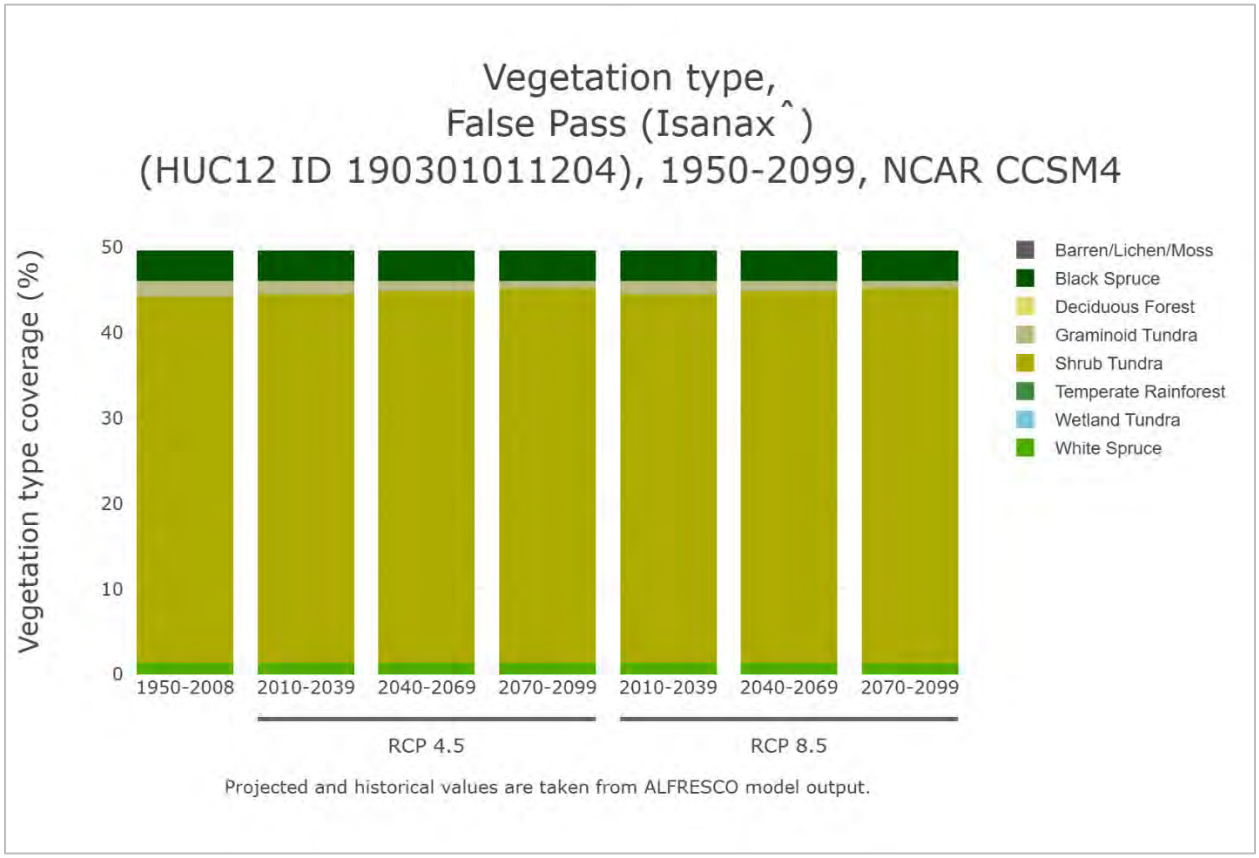



Source: UAF/SNAP 2026- Northern Climate Reports

**Figure F-15- False Pass Vegetation Type Map (1950 - 2099)**

Figure F-16 shows historical and projected changes in vegetation type coverage in False Pass from 1950 through year 2099.

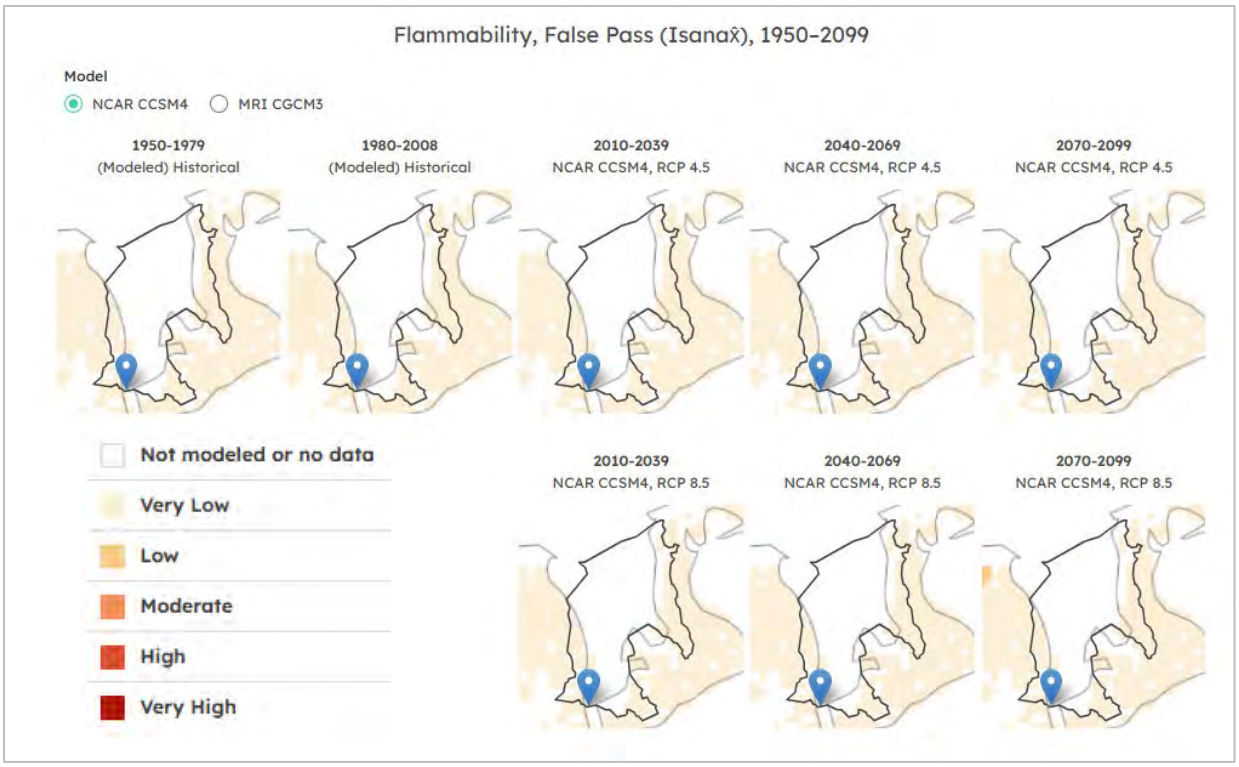
These models predict that the vegetation type in the community will stay relatively consistent through the end of the century, with a slight increase in the presence of Shrub Tundra and decrease in Graminoid Tundra type.




Source: UAF/SNAP 2026- Northern Climate Reports

**Figure F-16- False Pass Vegetation Type Graph (1950 - 2099)**

Flammability: Historically, False Pass has had Very Low flammability (UAF/SNAP 2026). Under the NCAR CCSM4 climate model, areas within False Pass are expected to remain Very Low flammability through the end of the century (Figure F-17).




Source: UAF/SNAP 2026- Northern Climate Reports

**Figure F-17- False Pass Historical and Projected Flammability (1950 - 2099)**

## F.4.2 Critical Facilities

**Table F-2- Critical Facilities- Native Village of False Pass**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Native Village of False Pass | Government | 5 | False Pass Tribal Council Office | 180 Unimak Dr | 54.862828 | -163.413463 | $100,000 | | | City | | | x | | x | x | x | x | x | | | |
| 2 | Native Village of False Pass | Commercial | 3 | Isanotski Liquors | Mountain Valley Rd | 54.854612 | -163.414538 | $100,000 | MH | Private | Other | | | x | | x | x | x | x | x | | | |
| 3 | Native Village of False Pass | Commercial | 0 | Residential Duplex | Larsen Dr | 54.854434 | -163.417555 | $100,000 | W1 | City | City | | | x | | x | x | x | x | x | | | |
| 4 | Native Village of False Pass | Commercial | 100 | Silver Bay South Bunkhouse | Unimak Dr | 54.865499 | -163.412537 | $100,000 | W2 | Private | Other | | | x | | x | x | x | x | x | | | |
| 5 | Native Village of False Pass | Commercial | 0 | Silver Bay S Shop | Unimak Dr | 54.865509 | -163.411853 | $100,000 | S3 | Private | Other | | | x | | x | x | x | x | x | | | |
| 6 | Native Village of False Pass | Commercial | 100 | Silver Bay S LegoLand | Unimak Dr | 54.865965 | -163.410894 | $100,000 | S3 | Private | Other | | | x | | x | x | x | x | x | | | |
| 7 | Native Village of False Pass | Commercial | 0 | Isanotski Warehouse | Unimak Dr | 54.866273 | -163.411082 | $100,000 | S3 | Private | Other | | | x | | x | x | x | x | x | | | |
| 8 | Native Village of False Pass | Commercial | 40 | Isanotski Grocery Store | Unimak Dr | 54.86689 | -163.410217 | $1,000,000 | S2 | Private | Other | | | x | | x | x | x | x | x | | | |
| 9 | Native Village of False Pass | Commercial | 250 | Silver Bay Seafoods Processing Plant | 100 Unimak Dr | 54.869869 | -163.408468 | $5,000,000 | S4 | Private | Other | | | x | | x | x | x | x | x | | | |
| 10 | Native Village of False Pass | Commercial | 450 | Silver Bay Dormitories | 101 Unimak Dr | 54.870682 | -163.408211 | $1,000,000 | W1A | Private | Other | | | x | | x | x | x | x | x | | | |
| 11 | Native Village of False Pass | Commercial | 0 | Round Top Creek Quarry | Old Landfill Rd | 54.849088 | -163.422823 | $1,000,000 | | | Other | | | x | | | x | x | | x | | | |
| 12 | Native Village of False Pass | Community | 0 | Isanotski Cemetery | 101 Isanotski Rd | 54.854844 | -163.415576 | $1,000,000 | | | | | | x | | x | x | x | x | x | | | |
| 13 | Native Village of False Pass | Community | 0 | City Park Playground | 18 Isanotski Dr | 54.852768 | -163.417387 | $100,000 | | City | City | | | x | | x | x | x | x | x | | | |
| 14 | Native Village of False Pass | Community | 0 | Isanotski Green House | 18 Isanotski Dr | 54.852556 | -163.418116 | $100,000 | | City | City | | | x | | x | x | x | x | x | | | |
| 15 | Native Village of False Pass | Community | 5 | Library & Post Office | 170 Unimak Dr | 54.855336 | -163.415078 | $1,000,000 | W2 | | City | | | x | | x | x | x | x | x | | | |
| 16 | Native Village of False Pass | Education | 100 | False Pass School | 132 Flat Top Rd | 54.853003 | -163.41842 | $6,976,502 | W2 | AEB | | | | x | | x | x | x | x | x | | | |
| 17 | Native Village of False Pass | Emergency Response | 2 | Public Safety | Larsen Dr | 54.855056 | -163.415896 | $500,000 | W2 | | City | | | x | | x | x | x | x | x | | | |
| 18 | Native Village of False Pass | Government | 8 | Isanotski Corporation | 101 Isanotski Rd | 54.854034 | -163.415207 | $100,000 | W1A | | Other | | | x | | x | x | x | x | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | Native Village of False Pass | Government | 2 | City Office & Rec Center | Beach Rd | 54.854975 | -163.414765 | $1,000,000 | W2 | City | City | | | x | | x | x | x | x | x | | | |
| 20 | Native Village of False Pass | Government | 5 | City Shop | Isanotski Dr | 54.851482 | -163.416079 | $500,000 | S2 | City | City | | | x | | x | x | x | x | x | | | |
| 21 | Native Village of False Pass | Medical | 2 | Health Clinic | Larsen Dr | 54.855056 | -163.415896 | $1,000,000 | W2 | | City | | | x | | x | x | x | x | x | | | |
| 22 | Native Village of False Pass | Transportation | 0 | Airport Runway | 180 Unimak Dr | 54.850404 | -163.409617 | $50,000,000 | 0.5 miles of Gravel path | State | State | | | x | | x | x | x | x | x | | | |
| 23 | Native Village of False Pass | Transportation | 0 | ADOT&PF Grader Shed | 180 Unimak Dr | 54.849361 | -163.410785 | $100,000 | S4 | State | State | | | x | | x | x | x | x | x | | | |
| 24 | Native Village of False Pass | Transportation | 0 | City Dock | Unimak Dr | 54.864171 | -163.408151 | $60,000,000 | | City | City | | | x | | x | x | x | x | x | | | |
| 25 | Native Village of False Pass | Transportation | 0 | Boat Ramp | Unimak Dr | 54.865651 | -163.409883 | $5,000,000 | | | City | x | | x | x | x | x | x | x | x | | | |
| 26 | Native Village of False Pass | Transportation | 0 | Cargo Handling Area | Unimak Dr | 54.86704 | -163.411182 | $1,000,000 | | | City | | | x | | x | x | x | x | x | | | |
| 27 | Native Village of False Pass | Transportation | 0 | Hoblet Harbor | Unimak Dr | 54.866081 | -163.408134 | $20,000,000 | S2 | | City | | | x | | x | x | x | x | x | | | |
| 28 | Native Village of False Pass | Transportation | 0 | Harbor Cargo Ramp | Unimak Dr | 54.867078 | -163.408289 | $5,000,000 | | | City | x | | x | x | x | x | x | x | x | | | |
| 29 | Native Village of False Pass | Transportation | 0 | Cargo Pier | Unimak Dr | 54.868021 | -163.409364 | $5,000,000 | | | City | | | x | | x | x | x | x | x | | | |
| 30 | Native Village of False Pass | Transportation | 0 | Breakwaters | Unimak Dr | 54.865972 | -163.40696 | $20,000,000 | | | City | | | x | | x | x | x | | x | | | |
| 31 | Native Village of False Pass | Utilities | 0 | Water Towers | Access Rd on Larsen Dr | 54.85685 | -163.418498 | $1,000,000 | | | City | | | x | | x | x | x | | x | | | |
| 32 | Native Village of False Pass | Utilities | 0 | Electric Generator Building | Isanotski Dr | 54.851709 | -163.416384 | $500,000 | S3 | | City | | | x | | x | x | x | x | x | | | |
| 33 | Native Village of False Pass | Utilities | 0 | Water Treatment Building | Bobby Dr | 54.853461 | -163.421717 | $500,000 | W2 | | City | | | x | | x | x | x | | x | | x | |
| 34 | Native Village of False Pass | Utilities | 0 | Fuel Farm | Unimak Dr | 54.862319 | -163.414137 | $20,000,000 | | | Private | | | x | | x | x | x | x | x | | | |
| 35 | Native Village of False Pass | Utilities | 0 | False Pass Water Dam | | 54.85572311 | -163.427039 | $20,000,000 | | | | | | x | | | x | x | | x | | x | |
| 36 | Native Village of False Pass | Utilities | 0 | Landfill | Landfill Rd | 54.873736 | -163.413837 | $500,000 | | | City | | | x | | x | x | x | | x | | | |
| **Total Occupants:** | | | **1072** | **Total Estimated Value:** | | | | **$229,576,502** | | | | | | | | | | | | | | | |

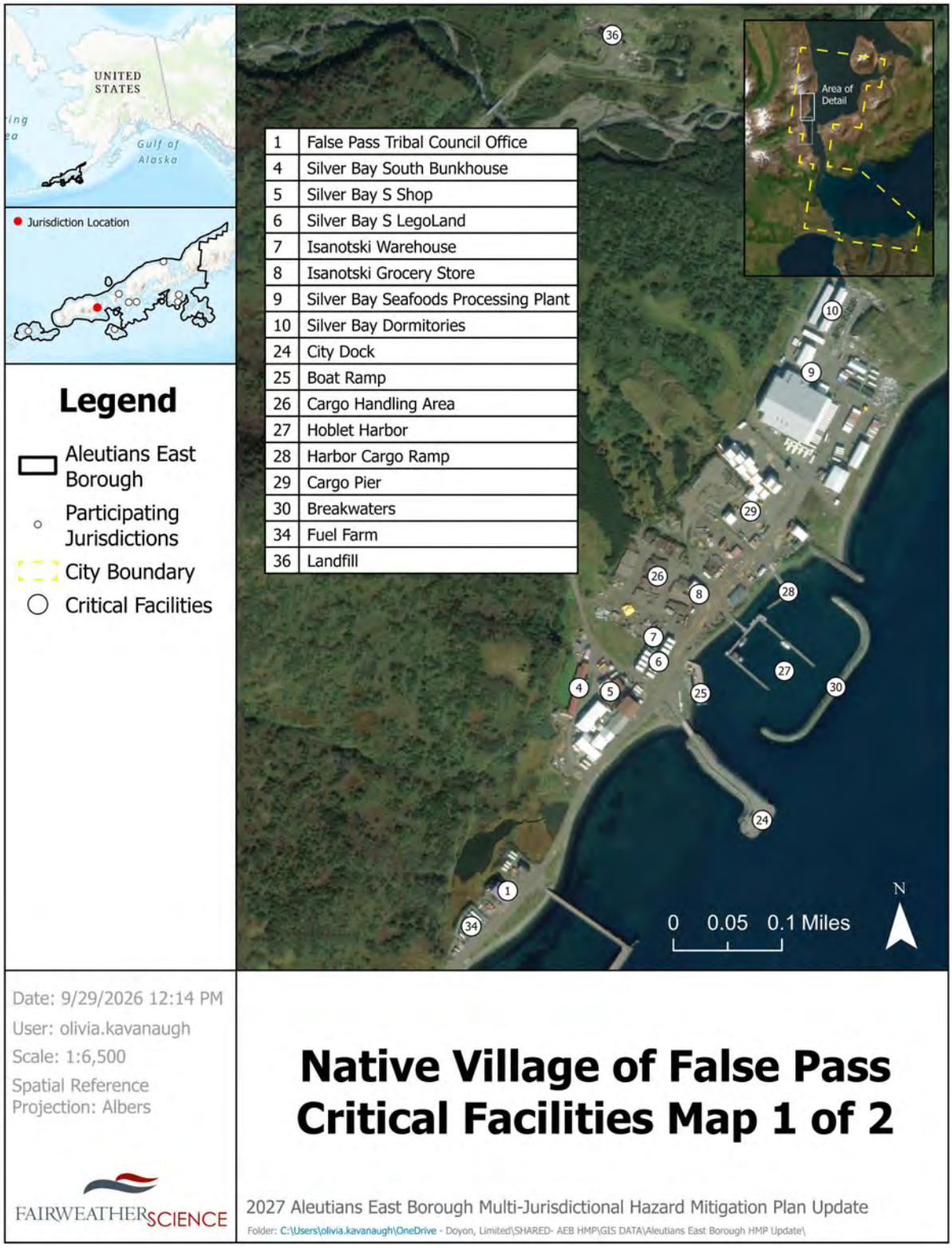



**Figure F-18- Native Village of False Pass Critical Facilities Map 1 of 2**

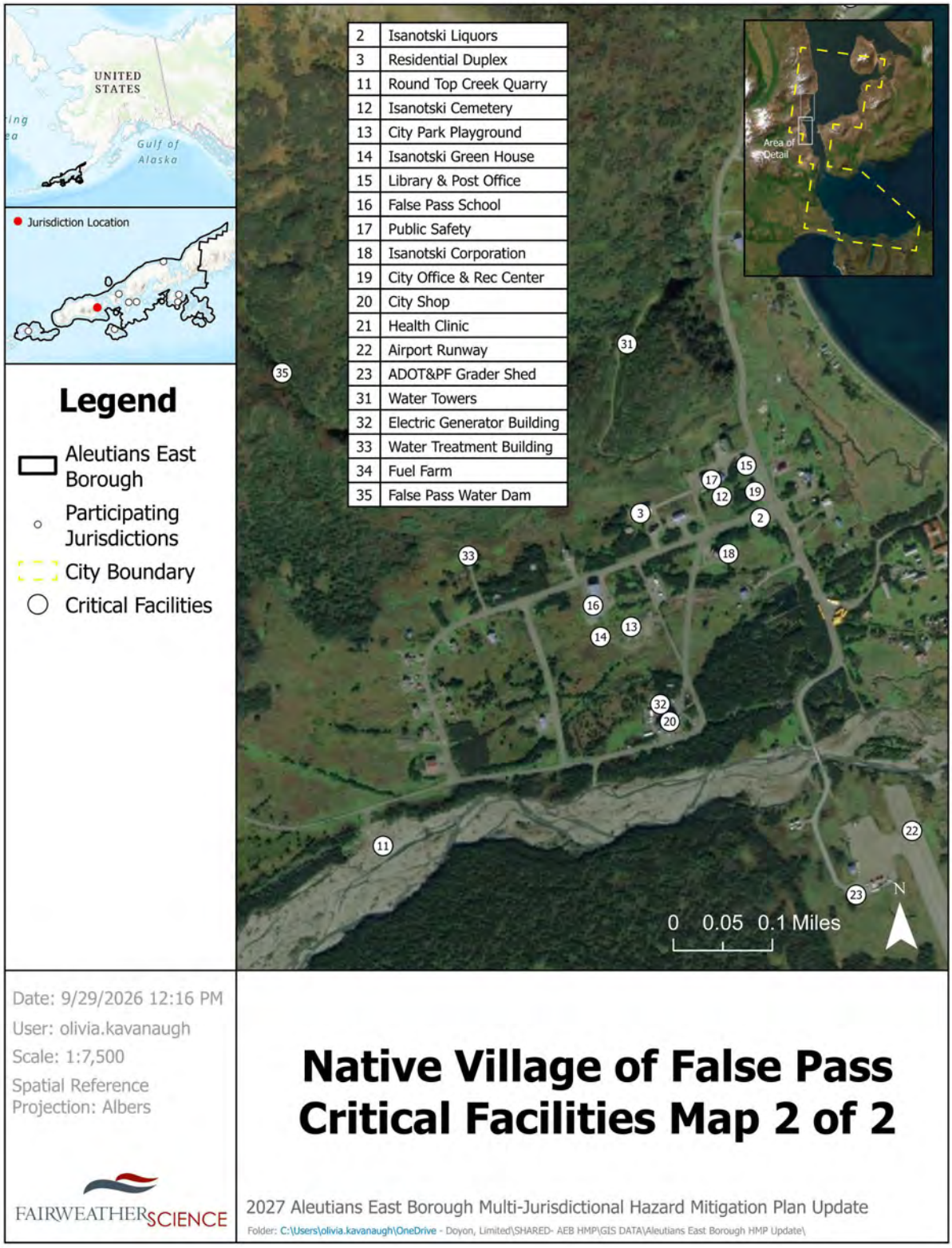



**Figure F-19- Native Village of False Pass Critical Facilities Map 2 of 2**

## F.4.3 Summary of Vulnerability

**Table F-3- Jurisdictional Summary of Vulnerability- Native Village of False Pass**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | 2 | 0 | $10,000,000 | 2 | 8 | $1,449,776 |
| Cryosphere-Snow Avalanche | Did not profile this hazard | | | | | |
| Earthquake | 36 | 1072 | $229,576,502 | 34 | 136 | $24,646,192 |
| Sediment Deterioration and Land Destabilization | 2 | 0 | $10,000,000 | 2 | 8 | $1,449,776 |
| \Flood | 34 | 1072 | $208,576,502 | 26 | 104 | $18,847,088 |
| Ground Failure/ Landslide | 36 | 1072 | $229,576,502 | 34 | 136 | $24,646,192 |
| Severe Weather | 36 | 1072 | $229,576,502 | 34 | 136 | $24,646,192 |
| Tsunami | 30 | 1072 | $186,576,502 | 23 | 92 | $16,672,424 |
| Volcano | 36 | 1072 | $229,576,502 | 34 | 136 | $24,646,192 |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | 2 | 0 | $20,500,000 | 4 | 16 | $2,899,552 |
| Invasive Species | Did not profile this hazard | | | | | |

The Native Village of False Pass's vulnerability to natural hazards extends beyond potential damage to buildings and infrastructure. Tribal members use surrounding lands for subsistence and cultural purposes, and research involving False Pass describes access to subsistence foods as dependent on interconnected harvesting, access, processing, sharing, equipment, labor, and commercial-fishing functions (Reedy-Maschner and Maschner 2012). Disruptions affecting harvesting areas, transportation, fisheries, important providers, equipment, or sharing relationships may therefore create consequences extending beyond the directly affected harvester or household. These consequences are not fully represented in the quantitative exposure estimates below.

## F.5 Capability Assessment

***Note: the Native Village of False Pass does not participate in the National Flood Insurance Program (NFIP).***

| Planning and Regulatory Tools | |
|---|---|
| **Plans** | **Existing?** |
| Comprehensive/ Master Plan | No |
| Capital Improvements Plan | No |
| Economic Development Plan | No |
| Emergency Operations Plan or Small Community Emergency Operations Plan | Yes- SCERP |
| Transportation Plan | Yes- Tribal Long Range Transportation Plan |
| Housing Plan | No- Houses are built close together |
| Hazard-specific plans or studies | Yes- tsunami inundation mapping |
| **Land Use Planning and Ordinances or Practices** | |
| **Ordinance/Practice** | **Existing?** |
| Zoning Ordinance | City- Yes, Tribe- No |
| Subdivision Ordinance | City- Yes, Tribe- No |
| Building Codes | No |
| Natural Hazard Specific Ordinance or Practices (Stormwater, Steep Slopes, Wildfire) | No |
| Acquisition of Land for Open Space and Public Recreation Uses | No |
| Maintenance Programs to Reduce Risk, E.G., Tree Trimming, Clearing Drainage Systems | No |
| Other | Tribe got funding to redo windows and roofs. Windows are rated for high winds. |
| **Administrative and Technical** | |
| **Resource** | **Existing?** |
| Tribal Council/ Governing Body | Yes |
| Tribal Chief Executive | Yes- Tribal Administrator |
| Mitigation Planning Committee | Yes, but not a formal Committee. Established to complete HMP Update. |
| Business Committees | No |
| Mutual Aid Agreements | No. Tribe relies on coordination with City, Borough, APIA/EAT, State, Coast Guard, and regional partners. |
| Code Inspector | No |

| Administrative and Technical | |
|---|---|
| **Resource** | **Existing?** |
| Environmental/Natural Resources Specialist | No |
| Emergency Manager | No |
| Community Planner | No |
| Housing Specialist | No |
| Engineer | No |
| Historian/ Cultural Advisor | No |
| Financial or Grants Specialist | Yes- need more staff/capacity |
| Administrative Staff Person | Yes- need more staff/capacity |
| Other- IGAP Coordinator | Yes |
| Warning Systems/ Services | Yes- Tsunami siren (owned by the City) |
| Hazard Data/Information | Yes- this HMP, FEMA, State of Alaska, AVO, NWS, USGS, Borough, and local observations. |
| Grant Writing | Yes |
| Geographic Information Systems (GIS) Analysis | Yes- but need additional training/capacity |

| Financial | |
|---|---|
| **Resource** | **Existing?** |
| Capital Improvements Project Funding | No |
| Gaming Revenue, Enterprise Revenues | No |
| Fees For Water, Sewer, Gas, or Electric Services | No |
| Fees From Festivals, Campsites, and recreational Areas | No |
| Permits and Other Fees | No |
| Federal Funding (BIA, HUD) | Yes |
| Contract Services | Yes |

| Education and Outreach | |
|---|---|
| **Program/Organization** | **Existing?** |
| Gatherings, Festivals, Celebrations and/or Meetings | Yes- holiday celebrations, Culture Camp |
| Natural Disaster or Safety- Related School Programs | Yes- school cultural programming |
| Fire Safety Programs | Yes- Through Clinic and VPSO |

Subsistence sharing and reciprocal support also represent documented community resilience capabilities in False Pass. Research conducted in False Pass found that surveyed households received subsistence foods from others and that sharing relationships extended beyond the community. The study also documented sharing of vessels and vehicles for subsistence harvesting and reciprocal fuel support that enabled households without boats to participate in harvesting trips (Reedy-Maschner and Maschner 2012). These relationships can support food access and community resilience.

# F.6 Mitigation Strategy

## F.6.1 Mitigation Goals

The Native Village of False Pass has identified its goals related to hazard mitigation as:

1. Protect life, health, and critical facilities from natural hazards.
2. Maintain reliable access to power, water, communications, transportation, healthcare, and emergency services during and after hazard events.
3. Reduce damage to Tribal facilities, homes, roads, bridges, docks, harbor infrastructure, fuel systems, and subsistence access points.
4. Incorporate local and Indigenous knowledge into hazard identification, land-use decisions, public education, and project prioritization.
5. Strengthen coordination among the Tribe, City, Borough, school, clinic, utilities, businesses, and state and federal partners.
6. Pursue feasible mitigation funding and complete priority projects within the five-year plan period.

## F.6.2 Status of Previously Identified Mitigation Actions

This is the first edition HMP for the Native Village of False Pass.

As such, there is no previous HMP and no previously identified mitigation actions for the jurisdiction to provide a status update.

Future plan updates will document the status and progress of mitigation actions identified in this HMP.

## F.6.3 2027 Mitigation Action Plan

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | All Hazards | Install backup generators in all critical facilities | M | Tribal Administrator | HMA, BIA Tribal Resilience, Denali Commission, USDA Rural Development | Structure and Infrastructure Projects | All | 0-2 years | B/C: This project would provide backup power to critical Tribal facilities during power outages, helping maintain essential services during emergencies. Costs would include generator purchase, installation, regular testing, and maintenance.<br>TF: This project is technically feasible but will require funding for generator equipment, installation, and ongoing testing and maintenance. | SCERP/EOP; Tribal Capital Improvement Plan; Tribal Continuity of Operations Plan (COOP); Tribal Facilities/Infrastructure Plan |
| **2** | All Hazards | Improve backup power, fuel security, communications redundancy, and emergency connectivity for critical Tribal facilities. | H | Tribal Administrator | HMA, THSGP, EMPG, USDA RD, Denali Commission, BIA | Structure and Infrastructure Projects | All | 0-2 years | B/C: This project would improve the Tribe's ability to maintain essential services and communications during power outages and other emergencies by providing reliable backup power, fuel, and communications.<br>TF: This project is technically feasible but will require funding for equipment, installation, regular testing, and maintenance. | SCERP/EOP; Tribal COOP; Tribal Capital Improvement Plan; Tribal Communications Plan; Tribal Infrastructure Plan |
| **3** | All Hazards | Create a community hazard education and annual HMP review program incorporating elder and subsistence-user observations. | M | Tribal Administrator | Tribe, EMPG, THSGP, BIA, USGS/NOAA, ANTHC, APIA | Education and Awareness Programs | NA | 0-2 years | B/C: This project would increase community awareness of local hazards and incorporate traditional and local knowledge into ongoing hazard mitigation planning.<br>TF: This project is technically feasible using existing Tribal staff, community outreach resources, and annual HMP review processes. | SCERP/EOP; Tribal Comprehensive Plan; Tribal Environmental/Natural Resources Plan |
| **4** | All Hazards | Continue to pursue ownership of the Old PeterPan cannery facility | H | Tribal Administrator | Tribe, EDA | Other | NA | 0-2 years | B/C: This project would allow the Tribe to pursue future use of the Old PeterPan cannery facility while addressing existing environmental contamination and associated risks.<br>TF: This project is technically feasible but will require environmental assessment, cleanup planning, funding, and coordination with applicable agencies. | Tribal Comprehensive Plan; Tribal Economic Development Plan; Tribal Capital Improvement Plan; Tribal Environmental/Brownfields Plan |
| **5** | Dam Failure | Identify and establish a permanent secondary potable water source with treatment and chlorination capabilities, including 1,000-gallon emergency storage and 2,000-gallon regular-use capacity. | H | Tribal Administrator | USDA, UPA, Alaska DEC, HMA | Structure and Infrastructure Projects | Water Plant | 0-2 years | B/C: This project would provide a reliable backup water source during emergencies, reducing the risk of water service disruptions following a hazard event.<br>TF: This project is technically feasible but will require engineering, treatment and chlorination equipment, and funding for construction and maintenance. | Water System Plan; SCERP/EOP; Capital Improvement Plan; Continuity of Operations Plan |
| **6** | Earthquake | Assess facilities for seismic risk and shaking impacts and retrofit high-risk facilities as needed. | M | Tribal Administrator | HMA, USGS, Denali Commission | Structure and Infrastructure Projects | All | 0-2 years | B/C: This project would identify and reduce seismic vulnerabilities in critical facilities, helping prevent damage and maintain essential services following an earthquake. | Capital Improvement Plan; Comprehensive Plan; Facilities Management Plan; SCERP/EOP |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | TF: This project is technically feasible but may require structural engineering assessments, specialized contractors, and funding for needed retrofits. | |
| **7** | Earthquake, Severe Weather | Complete seismic and wind vulnerability assessments for Tribal Office, warehouse, utilities, and other critical facilities; retrofit priority deficiencies. | H | Tribal Administrator | HMA, HUD, BIA Tribal Resilience, Denali Commission | Structure and Infrastructure Projects | All | 0-2 years | B/C: This project would identify vulnerabilities in critical Tribal facilities and reduce the risk of damage and service disruptions by addressing priority deficiencies.<br>TF: This project is technically feasible but will require qualified structural engineers, assessments, funding, and specialized contractors for priority retrofits. | SCERP/EOP; Tribal COOP; Tribal Capital Improvement Plan; Tribal Facilities/Infrastructure Plan |
| **8** | Flood | Pursue funding to map coastal/creek flood hazard areas/risk in False Pass | M | Tribal Administrator | HMA, NOAA Coastal Resilience, Alaska DGGS, USACE, ANTHC | Plans and Regulations | NA | 3-4 years | B/C: This project would identify areas at risk from coastal and creek flooding, supporting informed planning and reducing future damage to people and property.<br>TF: This project is technically feasible with funding and support from qualified mapping and engineering professionals. | Comprehensive Plan; Capital Improvement Plan; SCERP/EOP |
| **9** | Flood | Improve road and culvert drainage and stabilize vulnerable slopes/access routes, including landfill and utility access. | H | Tribal Administrator | HMA, USDA, USACE, Alaska DOT | Structure and Infrastructure Projects | Roads and culverts | 3-4 years | B/C: This project would improve drainage and stabilize vulnerable slopes and access routes, reducing flooding, erosion, and disruptions to critical access.<br>TF: This project is technically feasible using standard drainage and stabilization methods but may require engineering, equipment, funding, and outside contractors. | SCERP/EOP; Tribal Transportation Plan; Tribal Capital Improvement Plan; Tribal Infrastructure Plan |
| **10** | Flood, Sediment Deterioration and Land Destabilization | Assess and mitigate coastal shoreline loss, storm surge, and drainage risks affecting docks, roads, harbor areas, and subsistence access. | H | Tribal Administrator | USACE, HMA, NOAA Coastal Resilience, EDA Public Works, Denali Commission | Structure and Infrastructure Projects | Docks, Roads, Harbors | 3-4 years | B/C: This project would reduce damage and access disruptions to docks, roads, harbor areas, and subsistence areas from coastal shoreline loss, storm surge, and flooding.<br>TF: This project is technically feasible but will require engineering assessments, funding, and coordination with applicable agencies and contractors. | SCERP/EOP; Tribal Comprehensive Plan; Tribal Transportation Plan; Tribal Environmental/Natural Resources Plan |
| **11** | Flood, Sediment Deterioration and Land Destabilization | Continue to coordinate with Alaska DOT on the project to resurface the False Pass airport runway apron, install new lighting, and long-term erosion solution near the airport. | H | Tribal Administrator | FAA, USACE, HMA, Denali Commission, Alaska DOT | Structure and Infrastructure Projects | Airport | 0-2 years | B/C: This project would improve airport safety and reliability while reducing the risk of erosion-related damage and disruptions to airport operations.<br>TF: This project is technically feasible through continued coordination with Alaska DOT and may require agency funding and engineering support. | Airport Layout Plan; Capital Improvement Plan; Transportation Plan |
| **12** | Flood, Sediment Deterioration and Land Destabilization | Continue to coordinate with Alaska DOT on updating the Airport Layout Plan to determine feasibility of constructing a new airport in False Pass with a longer runway. | H | Tribal Administrator | FAA, USACE, HMA, Denali Commission, Alaska DOT | Structure and Infrastructure Projects | Airport | 0-2 years | B/C: This project would assess the feasibility of a longer runway and improved airport layout, potentially improving transportation reliability and emergency access.<br>TF: This project is technically feasible as a planning and assessment effort, with Alaska DOT coordination and additional | Airport Layout Plan; Comprehensive Plan; Transportation Plan; Capital Improvement Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | engineering and environmental studies as needed. | |
| **13** | Flood, Sediment Deterioration and Land Destabilization | Repair and replace culverts as needed to maintain proper drainage and reduce flooding and sediment deterioration risks. | H | Tribal Administrator | HMA, Alaska DOT | Structure and Infrastructure Projects | Culverts | 3-4 years | B/C: This project would improve drainage and reduce flooding, erosion, and sediment-related damage to roads and other infrastructure. TF: This project is technically feasible using standard drainage and roadway construction methods, with funding and equipment needed for repairs or replacement. | Capital Improvement Plan; Transportation Plan; Stormwater/Drainage Plan; Comprehensive Plan |
| **14** | Ground Failure/Landslide | Work with the State DGGS to map slopes and identify landslide-prone areas in False Pass. | M | Tribal Administrator | USGS, HMA, Alaska DGGS, Denali Commission | Plans and Regulations | NA | 3-4 years | B/C: This project would identify landslide-prone areas and help the community make informed decisions about development, infrastructure, and future mitigation. TF: This project is technically feasible through coordination with State DGGS and qualified geologic and mapping professionals. | Comprehensive Plan; Capital Improvement Plan; SCERP/EOP; Land Use Plan |
| **15** | Sediment Deterioration and Land Destabilization | Continue to monitor erosion along Unimak Drive and report to the USACE any erosion issues. | M | Tribal Administrator | USACE, NOAA Coastal Resilience, HMA | Natural Systems Protection | Road | 0-2 years | B/C: This project would help identify erosion problems early and support timely repairs, reducing the risk of damage to Unimak Drive and associated infrastructure. TF: This project is technically feasible using existing Tribal resources and coordination with the USACE. | Transportation Plan; Capital Improvement Plan; SCERP/EOP |
| **16** | Sediment Deterioration and Land Destabilization | Pursue funding for long-term erosion solution on Unimak Drive | H | Tribal Administrator | USACE, HMA, NOAA Coastal Resilience, EDA, Denali Commission | Natural Systems Protection | Road | 0-2 years | B/C: This project would reduce future erosion damage and help maintain reliable access along Unimak Drive. TF: This project is technically feasible but will require engineering studies, funding, and coordination with the USACE and other agencies. | Transportation Plan; Capital Improvement Plan; Comprehensive Plan |
| **17** | Severe Weather | Continue removing debris throughout the community to reduce the risk of flying debris during severe windstorms with gusts greater than 100 mph. | M | Tribal Administrator | HMA, Tribe, EMPG | Natural Systems Protection | All | 0-2 years | B/C: This project would reduce the risk of debris becoming airborne during severe windstorms, helping protect people, buildings, and infrastructure. TF: This project is technically feasible using existing Tribal resources, equipment, and community cleanup efforts. | SCERP/EOP; Public Works/Capital Improvement Plan |
| **18** | Tsunami | Work with AEB to identify and evaluate alternative sites for a new False Pass School outside the tsunami inundation area. | M | Tribal Administrator | NOAA, HMA, Alaska DGGS, Denali Commission | Plans and Regulations | School | 0-2 years | B/C: This project would evaluate options for locating the school outside the tsunami inundation area, reducing risk to students and staff during a tsunami. TF: This project is technically feasible as a planning effort but would require coordination with AEB, site studies, funding, and additional engineering. | Comprehensive Plan; School Facilities Plan; Capital Improvement Plan; SCERP/EOP |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **19** | Tsunami | Build an emergency shelter outside the tsunami inundation area to provide a safe location for residents during a tsunami or other coastal emergency. | H | Tribal Administrator | HMA, Denali Commission | Structure and Infrastructure Projects | Tsunami Shelter | 3-4 years | B/C: This project would provide a safe location for residents during a tsunami or other coastal emergency, reducing exposure to hazardous conditions. TF: This project is technically feasible but will require a suitable site, engineering and construction, and funding. | SCERP/EOP; Comprehensive Plan; Capital Improvement Plan; Shelter Plan |
| **20** | Tsunami | Develop and mark tsunami evacuation routes; install signs and identify high-ground assembly areas. | H | Tribal Administrator | NOAA, HMA, EMPG, Alaska DHS&EM | Structure and Infrastructure Projects | NA | 0-2 years | B/C: This project would provide clear, visible evacuation routes and assembly areas, helping residents evacuate more quickly and safely during a tsunami. TF: This project is technically feasible using existing City signs and resources, with installation at designated evacuation routes and high-ground assembly areas. | SCERP/EOP; Tsunami/Emergency Evacuation Plan; Comprehensive Plan |
| **21** | Volcano | Create emergency kits with public education materials for volcanic ashfall, including ash-rated masks. Make kits available at the City Office or other key community location for distribution. | M | Tribal Administrator | EMPG, USGS | Education and Awareness Programs | NA | 0-2 years | B/C: This project would provide residents with basic protective supplies and information, improving preparedness and reducing health risks during volcanic ashfall events. TF: This project is technically feasible using standard emergency supplies and existing Tribal distribution locations. | SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **22** | Volcano | Develop an ashfall protection project for HVAC, generators, water systems, vehicles, and critical equipment; establish protected supply storage. | M | Tribal Administrator | HMA, EPA, USDA, BIA, USGS | Structure and Infrastructure Projects | All | 0-2 years | B/C: This project would protect critical equipment, vehicles, water systems, and emergency supplies from volcanic ashfall, helping maintain essential Tribal services during and after an eruption. TF: This project is technically feasible but will require funding for protective measures, equipment, and secure storage improvements. | SCERP/EOP; Tribal COOP; Tribal Capital Improvement Plan; Tribal Facilities/Infrastructure Plan; Tribal Water/Utilities Plan |

### F.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Regularly inspect critical buildings and facilities following an earthquake event to ensure they remain structurally sound, safe for occupancy, and operational, and to identify and address damage or hazards promptly. | Not a current priority. |
| Consider participation in the Tsunami Awareness Program. | Not a current priority. |
| Install a tsunami siren in False Pass | Not a current priority. |
| Conduct community awareness activities, such as Winter Weather Awareness Week, to promote preparedness and safety during severe winter weather. | Not a current priority. |
| Update, as needed, emergency notification procedures and emergency planning for ash fall events. | Not a current priority. |
| Continue evaluating the water treatment plant and intake system to prevent ashfall from entering the water supply and continue shutting off the water supply valve during ashfall events. | Not a current priority. |
| Consider benefits of joining the NFIP. | Not applicable. |
| Relocate critical facilities out of known high risk hazard areas. If relocation is not feasible, retrofit facilities to be more resilient to hazards (elevate, etc.) | No locations to relocate critical facilities to. |
| Install earthquake straps on heavy/tall furniture in critical facilities to reduce the potential of damage/injuries during an earthquake. | Not a current priority. |
| Work with the AEB to relocate the False Pass School out of a tsunami inundation zone (~10 feet inundation) | Working to rebuild the school. |
| Relocate key critical facilities out of known flood hazard areas | Not a current priority. |
| Complete formal assessment and dam breach inundation mapping of the False Pass Dam to determine risk of potential dam failure | Not a current priority. |
| Develop a Dam Emergency Action Plan (EAP) with outlined procedures and protocols for the False Pass Dam in the event of a dam failure. | Not a current priority. |
| Provide dam safety information through various communication channels, including websites and social media, to residents downstream of the dam to increase awareness of potential hazards, emergency procedures, and evacuation routes. | Not a current priority. |
| Replace remote monitoring equipment at the water plant, including the turbidity meter and pumps, to improve reliability and operational monitoring. | Not a current priority. |
| Increase community education on invasive species through the City website and public information signs at popular recreation sites and trailheads. | Not a current priority. |

| Proposed Project | Reason for Not Selecting |
|---|---|
| Provide an annual community workshop on how to mitigate impacts of invasive slugs on local gardens | No slugs documented. |
| Adopt a local ordinance requiring inspections of barges and other vessels to prevent rats from entering the community. | Not a current priority. |
| Identify resources and funding opportunities for alder removal and management. | Not a current priority. |
| Regularly assess the City Dock and Fuel Dock for changing sea ice conditions and increased wave and storm exposure and inspect after significant sea ice events. | Not a current priority. |
| Retrofit or replace the City Dock and Fuel Dock as needed to improve resilience to changing sea ice and increased wave and storm exposure, with a focus on protecting utility lines, particularly water lines, from ice damage. | Not a current priority. |
| Install warning signs in landslide prone areas | Not a current priority. |
| Adopt an ordinance to prohibit removal of vegetation in landslide areas | Not a current priority. |

# F.7 Plan Update

## F.7.1 Changes in Development, including in Hazard-Prone Areas (Current and Future)

### F.7.1.1 Changes in Development Since 2021

There has been little development in False Pass between 2021 and 2026, and the Tribe's overall vulnerability to natural hazards has not significantly changed.

### F.7.1.2 Future/Planned Development

Future development in False Pass includes a new school that is right sized for the current population. The City is also continuing to work with DOT to upgrade the airport, with plans to build a new airport with a longer runway.

The City intends to coordinate with the Aleutians East Borough on the planned location of the False Pass School to determine if a location outside of the tsunami inundation area is feasible.

These planned developments are not anticipated to increase or decrease the Tribe's vulnerability to natural hazards. If a location outside of the tsunami hazard area is feasible, the Tribe's vulnerability to tsunami hazards will decrease.

## F.7.2 Changes in Priorities and Mitigation Efforts

As this is the Native Village of False Pass's first HMP, there are no previous mitigation priorities or efforts against which to identify changes.

The priorities and mitigation efforts established in this HMP represent the jurisdiction's initial approach to hazard mitigation. Future plan updates will document changes in priorities and mitigation efforts based on changes in hazard conditions, community needs, capabilities, and implementation progress.

# F.8 Plan Maintenance

## F.8.1 Planning Team MJHMP Maintenance Commitment

The Native Village of False Pass is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.7.

The Native Village of False Pass is committed to annually reviewing the Plan and Tribal staff will work to complete their review responsibilities.

## F.8.2 Continued Public Involvement

The Native Village of False Pass is dedicated to continued public involvement over the next five years.

The Native Village of False Pass will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2032.

Future engagement should also provide opportunities for Tribal citizens and other community knowledge holders to identify new local observations, environmental changes, subsistence-related impacts, traditional access concerns, and other knowledge relevant to hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where Indigenous Knowledge or other community-provided information is considered for incorporation into the MJHMP, appropriate attention should be given to Tribal review, attribution, sensitivity, and preferences regarding public disclosure.

## F.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The Native Village of False Pass jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The Tribal Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### F.8.3.1.1 Implementing

Upon adoption of the Plan, the Native Village of False Pass will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The Borough will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### F.8.3.1.2 Monitoring

The Native Village of False Pass will monitor the progress of mitigation actions on an annual basis. The Tribal Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### F.8.3.1.3 Evaluating

The Native Village of False Pass will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

Annual reviews should also consider whether new Indigenous Knowledge, local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

#### F.8.3.1.4 Updating

The Native Village of False Pass will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.7. The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Figure F-20 provides a visual of the HMP plan maintenance activities per year.

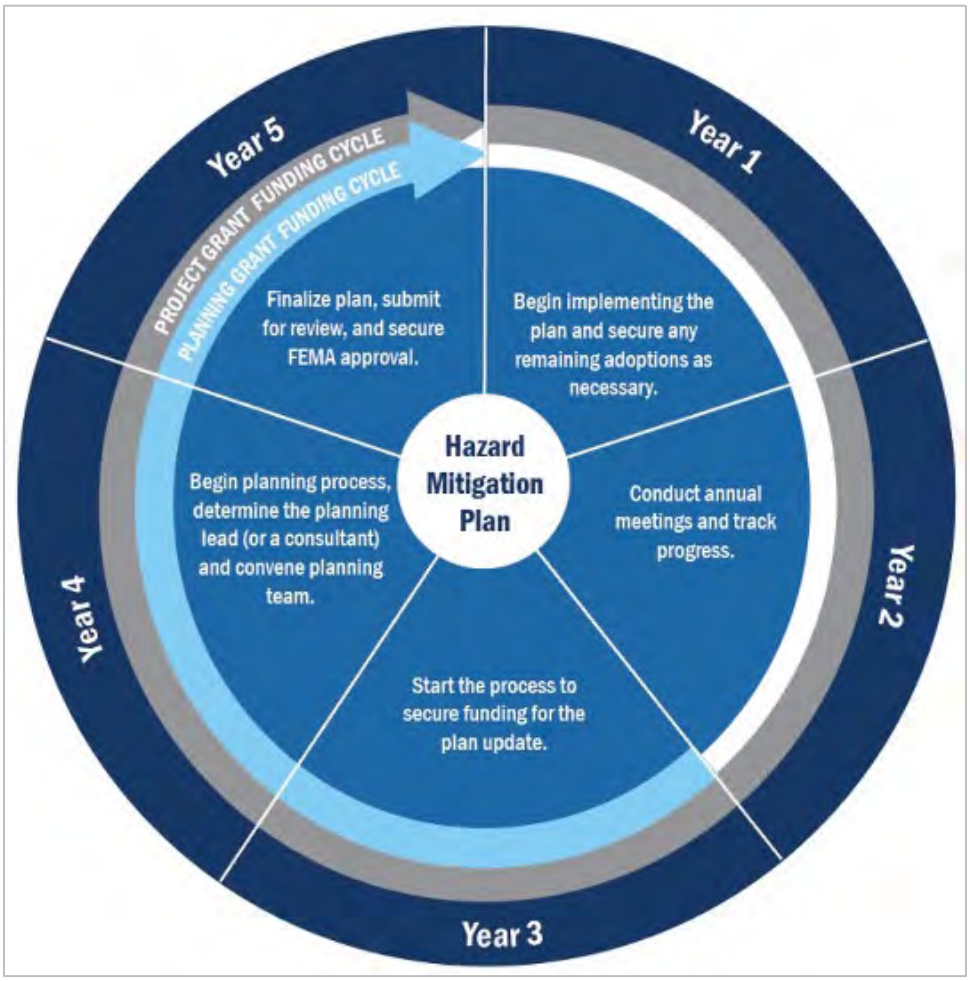



**Figure F-20- HMP Update Schedule**

## F.8.4 Plan Integration

The Native Village of False Pass will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other Tribal planning and implementation processes, when appropriate including other FEMA programs and initiatives.

The Tribe will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the Tribe's comprehensive and land use planning processes, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects as well as the upcoming APIA Regional Adaptation Plan.

As the plan is implemented, the Native Village of False Pass will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## F.9 Plan Adoption

The False Pass Tribal Council formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

### F.9.1 Tribal Assurances

The Native Village of Akutan assures that the Tribal Planning Team and Tribal Council will comply with applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding (including 2 CFR Parts 200 and 3002) and will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes.

[insert signed adoption resolution]

# G. City of King Cove



Photo Credit: Aleutians East Borough

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# G.1 Planning Team

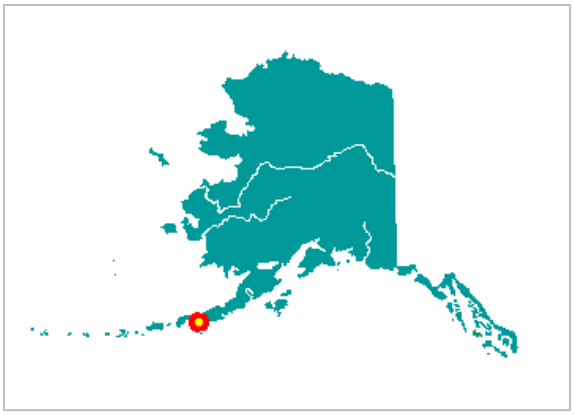
## G.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Chris Babcock** | Planning Manager, Fire Chief |
| **Gary Hennigh** | City Manager |
| **Chris Lewis** | Public Works Director |
| **Eric Siweck** | Police Chief |
| **Michael Franklin** | Superintendent |
| **Brenda Wilson** | City Council Member |
| **Carter** | College Student |
| **Amber Juefowytsch** | Ast. City Manager |
| **Robin Gould** | Clinic Manager |
| **Warren Wilson** | King Cove Mayor |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

# G.2 Community Profile

## G.2.1 Location and Geography

King Cove is located on the south side of the Alaska Peninsula, on a sand spit fronting Deer Passage and Deer Island. The community is located 18 miles southeast of Cold Bay and 625 miles southwest of Anchorage. Located in the maritime climate zone, temperatures average 25° to 55°F, with extremes from -9° to 76°F. Snowfall averages 52 inches annually, and total annual precipitation is 33 inches. Access to King Cove can be limited in the summer during fog and in the winter during high wind events.



## G.2.2 History

The Unangaŝ people have lived on and used the Alaska Peninsula and surrounding marine environment for thousands of years. The lands and waters surrounding present-day King Cove therefore have a history of Indigenous use that predates development of the modern community. The modern King Cove townsite developed beginning in 1911, when Pacific American Fisheries constructed a salmon cannery. Of the first ten founding families, five consisted of a European father and an Aleut mother. The City of King Cove was officially incorporated in 1949. The cannery operated continuously from 1911 to 1976, when it was partially destroyed by fire. Its rebuilding was spurred by the adoption of the 200-mile fisheries limit. While King Cove remains tied to fishing and fish processing, the 2024 closure of the Peter Pan Seafoods processing complex had a major economic impact on the community.

## G.2.3 Population

According to the 2024 ACS Census, the population of King Cove was 1,352.

## G.2.4 Demographics

King Cove is a mix of non-Native and Unangan residents. According to the 2020 census data, 327 residents identified as Alaska Native or American Indian, 213 identified as White, 109 identified as Asian, 29 identified as some Other Race, 10 identified as Black or African American, 6 identified as Native Hawaiian and Other Pacific Islander, and 63 identified as two or more races, with 48 of those residents identifying as White and Alaska Native or American Indian.

## G.2.5 Economy

King Cove's economy depends almost completely on the year-round commercial fishing and seafood processing industries. While the closure of the Peter Pan processing facility significantly impacted the community's economy, several smaller processing facilities are still in operation. Sixty-two residents hold commercial fishing permits. Subsistence harvesting also provides important food resources, including salmon, caribou, geese, and ptarmigan, supplementing household food supplies and reducing reliance on purchased food.

## G.2.6 Land Use

King Cove is defined by commercial and industrial infrastructure related to the fishing industry, with a small concentration of land dedicated to residential buildings. The undeveloped land surrounding King Cove is primarily Alaska Native Land, owned by the King Cove Corporation.

## G.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following community-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **1968 King Cove Alaska Comprehensive Development Plan** | Establish a long-term framework for King Cove's land use, transportation, infrastructure, and community development. | Used to identify infrastructure and land use planning for the HMP Update. |
| **1981 City of King Cove Alaska Comprehensive Plan** | Evaluate population, land use, housing, transportation, utilities, and community facilities to guide future community expansion. | Used to identify hazard areas, infrastructure and land use planning for the HMP Update. |
| **2003 City of King Cove Waterfront Utilities Plan** | Assess waterfront utility needs and identify infrastructure improvements to support future waterfront and harbor development. | Used to identify hazard areas, infrastructure and utility use planning for the HMP Update. |
| **2006 Comprehensive Community Plan** | Assess existing conditions and establish goals, policies, and land-use priorities for King Cove's future growth and development. | Used to identify hazard areas, infrastructure and land use planning for the HMP Update. |
| **2007 USACE Erosion Information Paper- King Cove** | Baseline erosion assessment of the community. | Used to describe historical erosion locations, rates, and impacts in the communities where reports were available. |
| **2010 & 2021 Aleutians East Borough MJHMP** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **2016 Tsunami Inundation Maps for King Cove and Cold Bay Communities, Alaska** | Identify potential tsunami hazards for the geographies and model the extent of tsunami waves generated earthquake and landslide events. | Referenced data in Tsunami hazard profile/annex. Used inundation maps as the data source for potential losses due to tsunami event. |

Source: State of Alaska Community Plans Library, E.N. Suleimani, D.J. Nicolsky, R.D. Koehler, J.T. Freymueller, and A.E. Macpherson 2016

# G.4 Risk Assessment

## G.4.1 Hazards

The City of King Cove Planning Team identified the following natural hazards that may impact their geography/community.

✓ Hazard profiled for this jurisdiction in the MJHMP Update
X Hazard not profiled for this jurisdiction in the MJHMP Update

X Changes in the Cryosphere- Sea Ice
✓ Changes in the Cryosphere- Snow Avalanche
✓ Dam Failure
✓ Earthquake
✓ Flood
✓ Ground Failure/Landslide
✓ Invasive Species
X Sediment Deterioration and Land Destabilization
✓ Severe Weather
✓ Tsunami
✓ Volcano
X Wildland Fire

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere- Sea Ice | Did not profile this hazard | | |
| Cryosphere- Snow Avalanche | 2- Possible | 4- Catastrophic | King Cove is vulnerable to avalanches due to its steep and rugged mountainous terrain, heavy snowfall, strong winds, and rapidly changing winter weather conditions. Avalanches can occur on steep slopes and may be triggered by heavy snowfall, wind loading, rain, warming temperatures, or seismic activity.<br>The 2021 Aleutians East Borough Hazard Mitigation Plan identifies three avalanche-prone areas in and around King Cove.<br>The Planning Team reported an avalanche on February 1, 2012. This avalanche reportedly struck the Alaska Commercial (AC) Store. |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and King Cove itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 2- Possible | 2- Limited | Sediment deterioration and land destabilization can occur throughout King Cove, with coastal land destabilization being the biggest concern for the community. Since King Cove is classified as a coastal community, it is susceptible to shoreline |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.<br>Riverine land destabilization isn't identified as a concern for the community.<br>According to a 2007 USACE study, erosion occurs along Gould's Lagoon shoreline and that the roadway connecting the Old Ram and New Ram subdivisions is the most vulnerable. |
| Flood | 3- Likely | 2- Limited | According to the Aleutians East Borough Planning Team, W Lagoon Rd in King Cove experiences annual flooding related to the King Tide. During the 2025 event, flooding cut off a portion of W Lagoon Rd, which resulted in 30-40 people unable to access or leave their homes.<br>Due to the absence of major rivers, riverine flooding is not considered a significant hazard, according to the Planning Team. Historical flooding has generally been limited to localized inundation of low-lying coastal areas, harbor facilities, and roadways during severe North Pacific storms. |
| Ground Failure/ Landslide | 2- Possible | 2- Limited | King Cove is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity. |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of King Cove is susceptible to severe weather events and impacts.<br>The Planning Team reported that King Cove experiences some of the most severe winter storms in Alaska because of its location on the Pacific side of the Alaska Peninsula. The community is frequently affected by powerful North Pacific low-pressure systems that produce hurricane-force winds, heavy snow, freezing rain, blizzard conditions, and coastal flooding. |
| Tsunami | 3- Likely | 4- Catastrophic | King Cove is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. Most critical facilities and infrastructure in King Cove are vulnerable to effects from tsunamis, due to the estimated inundation zone |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | encompassing most of the infrastructure in the community. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of King Cove is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.<br>Volcanic ashfall is the primary volcanic hazard that may impact King Cove.<br>King Cove is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, King Cove has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community. |
| Wildland Fire | Did not profile this hazard | | |
| Dam Failure | 2- Possible | 3- Critical | There are two dams in King Cove, both owned by the City. The two proposed High hazard dams in King Cove are the Clear Creek Dam and Delta Creek Dam. There has not been a history of dam failure in King Cove. |
| Invasive Species | 3- Likely | 2- Limited | King Cove has had historical vessel traffic related to the fishing and shipping industry, which has contributed to the spread of invasive species in the region. The entire natural area surrounding King Cove is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. King Cove's location adjacent to a busy coastal port is the primary human-caused pathway in the spread of invasive species in the region. |




**Figure G-1- City of King Cove Planning Area**

#### G.4.1.1 Changes in the Cryosphere- Sea Ice

The City of King Cove Planning Team did not select this hazard to be profiled in the MJHMP Update.

### G.4.1.2 Changes in the Cryosphere- Snow Avalanche

#### G.4.1.2.1 Location

The 2021 Aleutians East Borough Hazard Mitigation Plan identifies three avalanche-prone areas in and around King Cove (Figure G-2). Although no damaging avalanches have been recorded there recently, these paths remain active hazard zones during winters with heavy snowfall and rain-on-snow events.

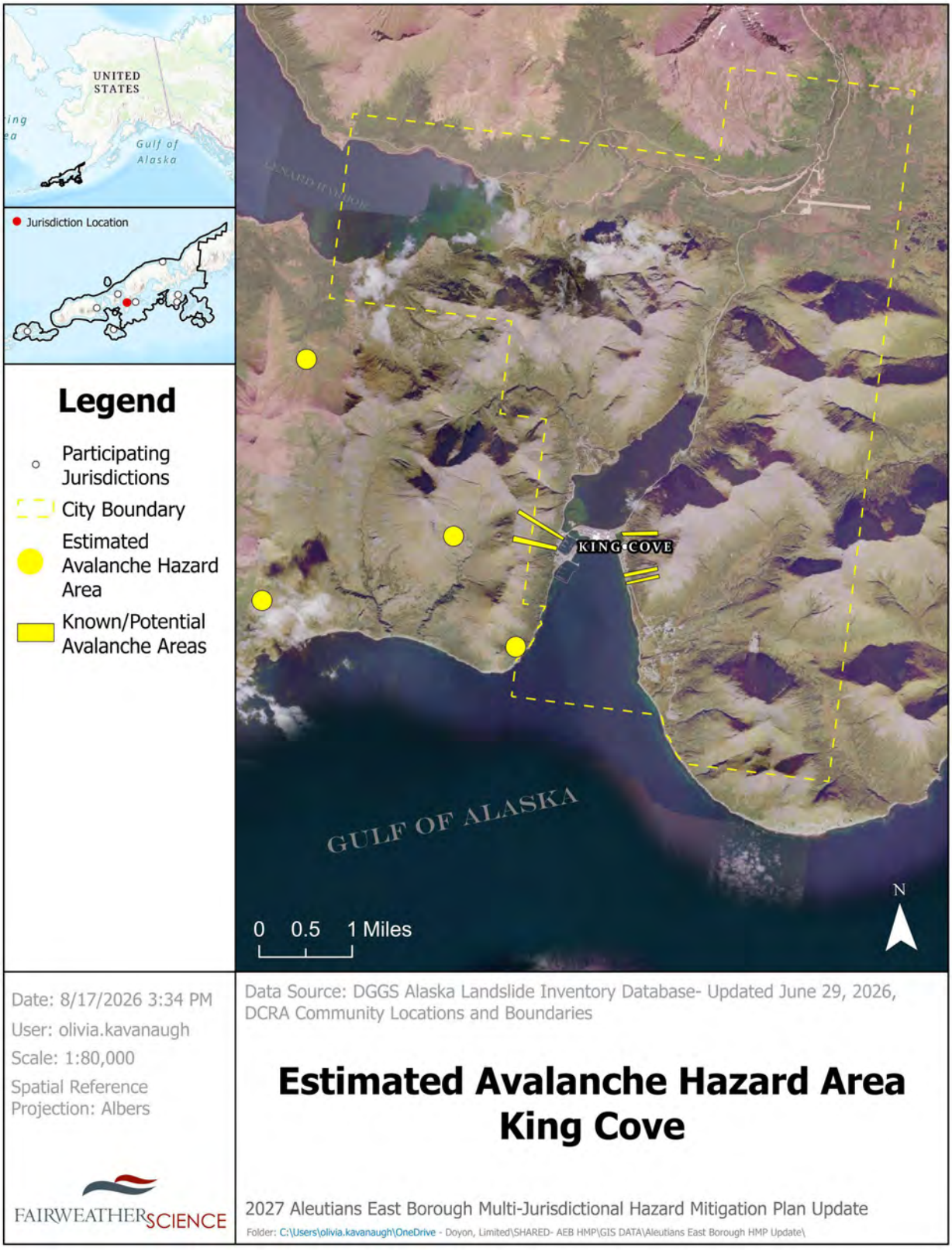



**Figure G-2- King Cove Avalanche Hazard Areas**

#### G.4.1.2.2 History

An *Anchorage Daily Times* article of 1960 describes an event in which a dwelling in King Cove was flattened by strong winds during a snow storm at approximately 10 p.m. on January 19, 1960. Five young children and one adult died during this event. In the article, their deaths are attributed to exposure while pinned under the wreckage of their home, which was blown over by winds of about 60 knots. The temperature was reported to be 18 degrees F at the time.

Community oral history provided through the City of King Cove also describes a destructive event remembered as occurring sometime in the 1950s or 1960s. Elders recalled a mud and rock avalanche coming down near Ram's Creek Road, striking a house, carrying it toward the beach, and continuing to the bay. The timing and some details of the oral account overlap with the documented 1960 event, while other details differ. It is therefore unclear whether the written and oral accounts represent different descriptions of the same event or document separate events. Both are retained here as part of King Cove's documented and community-remembered hazard history.

Avalanche impacts have also occurred more recently. The Planning Team reported an avalanche on February 1, 2012. This avalanche reportedly struck the Alaska Commercial (AC) Store. An article from the Bristol Bay Times by Hannah Heimbuch, dated March 9, 2012, described this impact on the community:

> *AC Store Manager, Jeff Watt, said he and several other employees typically would have been there at the time-around 7:50 p.m. on February 1-but weather had prompted him to send everyone home early just 20 minutes before. When the crew arrived early the next morning, they noticed a few inches of water on the sales floor, leaking from broken pipes. The scene in the warehouse was more severe, with a snow slide taking up a large part of the room, 12 to 14 feet at its deepest level. The store stocks large appliances like washers, dryers and refrigerators, and of the 12 units stored in the warehouse, only two survived intact. 'It tossed one about 30 feet before it ran into something else,' Watt said. With such a heavy appliance getting tossed around like a basketball, Watt and his employees were fortunate to be on their way home when the snow hit. It took several bobcats and 20 people several days to get the snow cleared from the warehouse and clearing damaged merchandise and taking inventory took employees another two weeks.*
>
> *This has been a particularly undecided winter on the peninsula and in King Cove, with seriously fluctuating temperatures and high snowfall, which makes for an unstable snow pack. This was one of several avalanches that occurred over the span of a few days-albeit one of the most destructive seen in years. 'They've had a couple of avalanches at this store before,' Watt said, 'But it's opened the door a couple of feet. (This) probably came into my building a couple of hundred feet.*

There have been no documented avalanches in King Cove during the last five years (2021-2026). However, avalanche hazard remains a recognized risk for the community because of the steep mountains immediately above portions of the town.

#### G.4.1.2.3 Extent (Magnitude and Severity)

King Cove has experienced at least one documented damaging avalanche in recent history when an avalanche struck the Alaska Commercial (AC) Store on February 1, 2012. Community members also report a historic avalanche more than 50 years ago that destroyed a residence. Although no recent avalanche incidents have occurred, continued development near steep slopes, changing winter weather patterns, and increased rain-on-snow events support maintaining avalanche hazards as a planning concern.

Based on the extent of past snow avalanche events and the criteria identified in Table 5 of the Base Plan, the extent of snow avalanche in King Cove is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### G.4.1.2.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team does not report any specific previous impacts to geography/land from snow avalanches in King Cove. |
| Infrastructure | The 2012 reported avalanche event damaged the Alaska Commercial (AC) store, including water damage from broken and leaking pipes. The Planning Team reports that there has been no other damage from snow avalanches to homes, business, or public facilities in King Cove. |
| People | On January 19, 1960, a winter storm event with a reported avalanche resulted in the deaths of six people, who reportedly died from exposure after being pinned in their houses. The Planning Team reports that there have been no other injuries or fatalities from avalanches in King Cove. |
| Utilities | The Planning Team does not report any specific previous impacts to utilities from snow avalanches in King Cove. |
| Transportation | The Planning Team does not report any specific previous impacts to transportation from snow avalanches in King Cove. |
| Economy | The Planning Team does not report any specific previous economic impacts due to snow avalanches in King Cove. |
| Subsistence Resources | The Planning Team does not report any specific previous impacts to subsistence resources from snow avalanches in King Cove. |

#### G.4.1.2.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that King Cove will experience a snow avalanche event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### G.4.1.2.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of snow avalanche hazards in Alaska. |
| Location | It is possible future climate conditions will influence the location of snow avalanche hazards in Alaska. As warmer, wetter winters become more prevalent, heavy-snow avalanches may occur on different slopes that have not historically experienced avalanches. |
| Extent | Future climate conditions are likely to influence the magnitude and severity of avalanches. Avalanche activity is determined by several factors, including snowpack type, internal liquid volume, air temperature, precipitation, elevation, slope, ground cover, etc. An increase in liquid content within snowpack, from increased December-March air temperature and January-February increased precipitation, may lead to greater occurrence of wet snow avalanches, especially in late winter/early spring (Ballesteros-Canovas et al. 2018). |
| Impact | Future climate conditions are likely to influence the impact of avalanches. As snowpack experiences greater liquid volume, avalanche risk will increase (Ballesteros-Canovas et al. 2018). As snowpack retreats to higher elevations due to |

| Description of Future Conditions | |
|---|---|
| | reduced snowpack and quickened melt, the impacted area will also shift upwards. Impacts in this scenario will likely be due to loss of water supply, affecting culture, wildlife resources, and tourism (IPCC 2018). Infrastructure in avalanche hazard zones may also be impacted by an increase in frequency and extent of wet snow avalanches. Damage to structures may vary depending on the impact pressure of the avalanches. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of future avalanche events in the Aleutians East Borough Planning Area. Some studies suggest that a warming climate may increase avalanche risk due to changes in snow accumulation and moisture content, as well as loss of snowpack stability because of changing air temperature (DGGS 2023d). Ballesteros-Canovas et al. (2018) predicts an increase in avalanche activity in the 2nd half of the 21st century; largely wet-snow avalanches due to increased air temperature and precipitation. |
| Population Patterns | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in the Aleutians East Borough Planning Area. However, this is jurisdiction dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in construction moving outside of avalanche zones. Due to the cost and difficulty of building in the Aleutian Islands, it is possible that if a home is damaged by an avalanche that the residents may move out of the community completely. |
| Land Use Development | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in the Aleutians East Borough Planning Area. However, this is jurisdiction dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in land use which promotes development outside of possible avalanche slide paths. |
| Subsistence Resources | Future climate conditions are not anticipated to influence subsistence resources as they relate to avalanche hazards. |

### G.4.1.3 Dam Failure

#### G.4.1.3.1 Location

There are four dams in King Cove, all owned by the City. The two proposed High hazard dams in King Cove are the Clear Creek Dam and Delta Creek Dam. Two other dams, Old Rams Creek Dam and Waterfall Creek Dam, have an unknown hazard classification.

Figure G-3 shows the location of the dams in King Cove as well as the potential inundation area if the dam were to fail.

As formal dam failure inundation mapping has not been completed for these dams, dam failure hazard areas in the community were identified by buffering the 1-mile downstream route by 0.1 miles (528 feet). This methodology does not account for site-specific topography or hydrology and may over or underestimate dam failure hazard areas in the community.

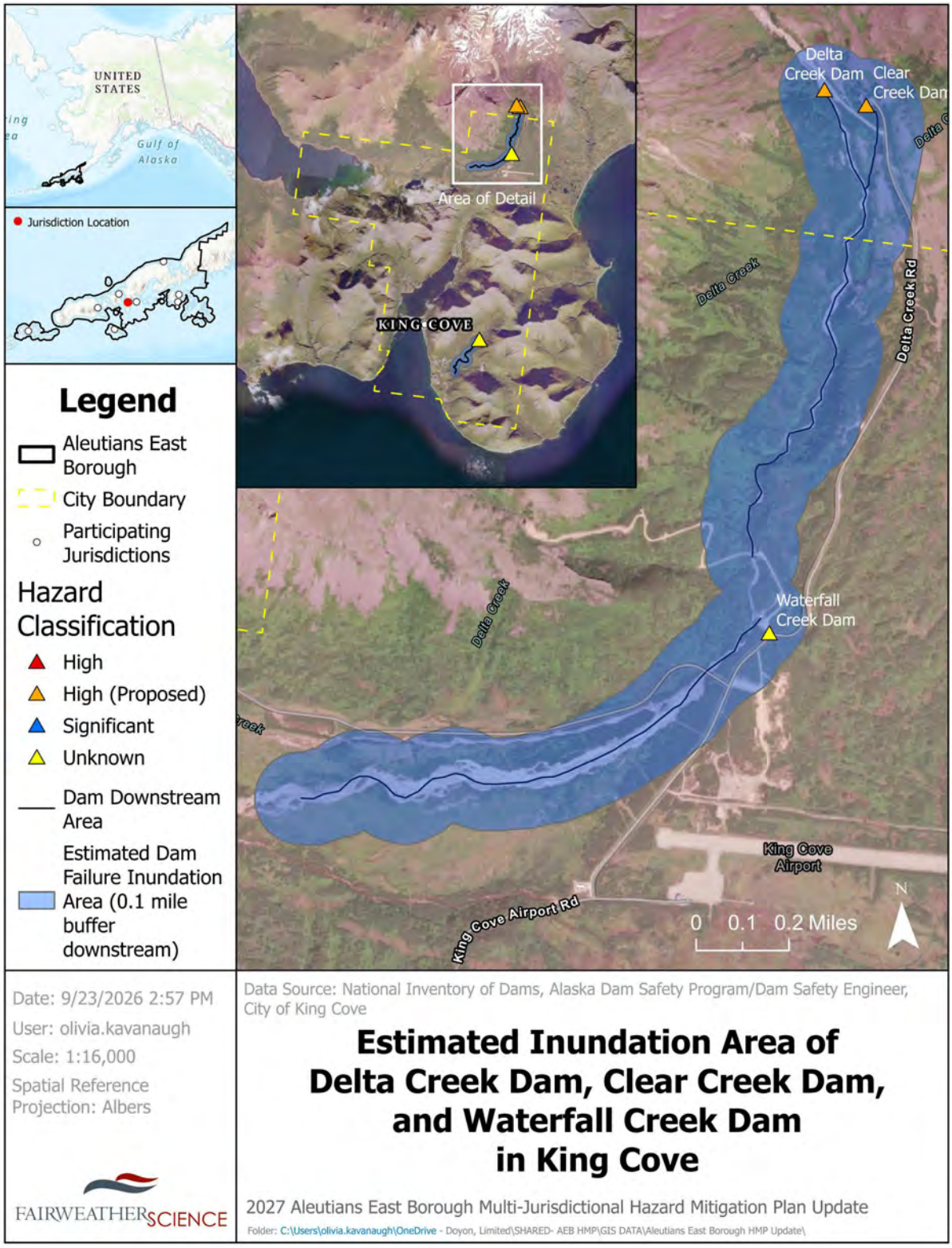



**Figure G-3- Location and Estimated Inundation Area of Delta Creek Dam, Clear Creek Dam, and Waterfall Creek Dam in King Cove**

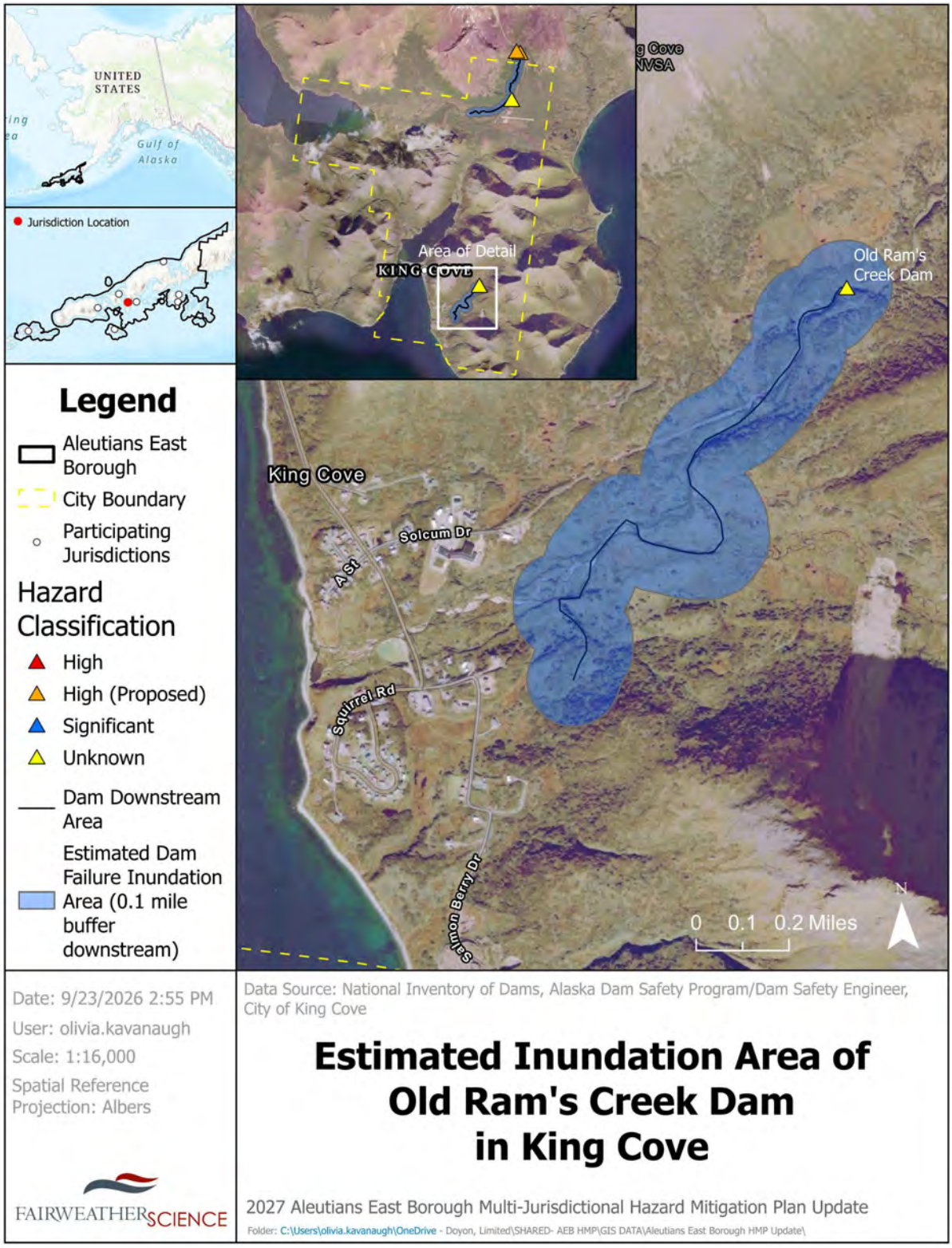



**Figure G-4- Location and Estimated Inundation Area of Old Ram's Creek Dam in King Cove**

| Clear Creek Dam | |
|---|---|
| Hazard Classification | High (Proposed by Alaska State Dam Engineer) |
| Owner | City of King Cove |
| Year Built | Unknown |
| Dam Type | Concrete |
| Dam Purpose | Hydroelectric |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | There is no information available about the inspection frequency of Clear Creek Dam, or the last inspection date. |
| Downstream Description | The dam outflow consists of a continuation of Clear Creek, which flows approximately 0.25 miles before its confluence with Delta Creek. Delta Creek flows another 4.5 miles downstream before depositing into Lenard Harbor. |
| Downstream Area | The Dam is located east of Anvil Mountain, in low shrub, alpine habitat. Clear Creek (the outflow) flows to its confluence with Delta Creek which then flows into more vegetated, lower lying lands for 4.7 miles before draining into Lenard Harbor. There are numerous roadways and two bridges downstream of the dam. |
| Downstream Dams | There are no dams immediately downstream of the Clear Creek Dam. |
| Downstream Bridges | There are three (3) bridges downstream of Clear Creek Dam. The first bridge allows Reservoir Dam Road to pass over Clear Creek approximately 300 feet downstream of the dam. The next two bridges occur downstream of the confluence of Clear Creek and Delta Creek, which means they are at risk of possible inundation from two different dams. The second bridge is approximately 0.9 miles downstream, allowing Waterfall Creek Road to pass over Delta Creek. The second bridge is approximately 1.1 miles downstream and allows AEB Route 1 to pass over Delta Creek. |
| Reservoir Area | The reservoir is continuously fed by Clear Creek upstream of the dam. The reservoir is narrow, approximately 150 feet long and 60 feet wide. |
| Downstream Development | King Cove Airport is located 1.5 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam. |
| General findings of the last inspection | There is no data available on the date of the last dam inspection, or what the condition assessment of Clear Creek dam is currently. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of Clear Creek and Delta Creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Clear Creek Dam. Based on the State of Alaska Dam Safety Engineer's preliminary inspection, critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: State of Alaska Dam Safety Engineer 2025, NHA 2023



Source: NHA 2023

**Figure G-5 - Clear Creek Dam**

| Delta Creek Dam | |
|---|---|
| Hazard Classification | High (Proposed by Alaska State Dam Engineer) |
| Owner | City of King Cove |
| Year Built | 1975 |
| Dam Type | Concrete |
| Dam Purpose | Hydroelectric |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | No information is available on the inspection frequency of the Delta Creek Dam. |
| Downstream Description | The dam outflow consists of a continuation of Delta Creek, which flows approximately 0.25 miles before Clear Creek joins Delta Creek. From Delta Creek Dam, Delta Creek flows another 4.7 miles downstream before depositing into Lenard Harbor. |
| Downstream Area | The Dam is located east of Anvil Mountain, in low shrub, alpine habitat. Delta Creek (the outflow) then flows into more vegetated, lower lying lands for 4.7 miles before. There are numerous roadways and two bridges downstream of the dam. Clear Creek dam is also downstream of Delta Creek Dam. |
| Downstream Dams | There is one (1) dam downstream of the Delta Creek Dam. Clear Creek Dam is located approximately 450 feet downstream and to the east of the Delta Creek Dam-Clear Creek Dam is not located in the same water drainage of Delta Creek Dam. |
| Downstream Bridges | There are two (2) bridges downstream of Delta Creek Dam. The first bridge is approximately one mile downstream, allowing the Waterfall Creek Road to pass over Delta Creek. The second bridge is approximately 1.25 miles downstream and allows AEB Route 1 to pass over Delta Creek. |
| Reservoir Area | The reservoir area is very small, with an approximate length of 90 feet and width of 45 feet. The reservoir is continuously fed by Delta Creek. |
| Downstream Development | Although it never crosses Delta Creek, Airport Road parallels the creek for approximately 1.8 miles. King Cove Airport is located 1.6 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam. |
| General findings of the last inspection | No information has been made available about the dam's most recent inspection, or what condition it was rated. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of Delta Creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Delta Creek Dam. |

Source: State of Alaska Dam Safety Engineer 2026, NHA 2023

| Old Rams Creek Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of King Cove |
| Year Built | 1975 |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | The length of the dam is approximately 45 feet long. The height is unknown. |
| Drainage Area | Unknown |
| Inspection Frequency | The dam is inspected annually by the City of King Cove Public Works Department The last inspection was conducted in 2025. |
| Downstream Description | The dam outflow consists of a small, narrow outflow creek, Ram Creek. Ram Creek Dam Road parallels Ram Creek the entire length of the creek. The creek runs through typical Aleutian vegetation, primarily alders and salmonberry bushes and devoid of trees. The creek terminates 1.6 miles downstream of the dam into King Cove. |
| Downstream Area | The Dam is located Southwest of the city of King Cove. The most recent inspection noted the access trail from the Water Pumphouse to the dam was engulfed by salmonberry bushes, cow parsnip, and alder trees. |
| Downstream Dams | There are no dams immediately downstream of the Old Rams Creek Dam. |
| Downstream Bridges | There is one (1) bridge downstream of Old Rams Creek Dam. Approximately 1.5 miles downstream, a bridge crosses over the outflow stream, allowing Rams Creek Road to pass over the top. |
| Reservoir Area | Unknown |
| Downstream Development | Ram Creek Dam Road parallels Ram Creek the entire length of the creek. Approximately 1.5 miles downstream of the dam, King Cove School, King Cove Powerhouse and multiple residential structures are located North of the creek. South of the creek, immediately adjacent to the creek, is the King Cove Baseball Field, and approximately 0.2 miles South is the King Cove Public Works building and the Agdaagux Tribe of King Cove building. |
| General findings of the last inspection | No definitive inspection rating was given to Old Rams Creek Dam during the 2025 inspection. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Old Rams Creek Dam. Based on the critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: City of King Cove Planning Team

| Waterfall Creek Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of King Cove |
| Year Built | 2017 |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | The dam is approximately 60 feet long; the height is unknown. |
| Drainage Area | Unknown |
| Inspection Frequency | Waterfall Creek Dam is inspected annually by the City of King Cove Public Works. The last inspection was conducted in 2025. |
| Downstream Description | The dam outflow immediately flows into Delta Creek. Approximately 0.25 miles downstream, the water pumphouse is adjacent to the creek. The False Pass school, Mountain Valley Road, and the Isanotski Cemetery. |
| Downstream Area | Although it never crosses Delta Creek, Airport Road parallels the creek for approximately 1.8 miles. King Cove Airport is located 1.6 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam |
| Downstream Dams | There are no dams immediately downstream of the Waterfall Creek Dam. |
| Downstream Bridges | There is one (1) bridge downstream of Waterfall Creek Dam. Approximately 0.25 miles downstream, a bridge crosses over the Delta Creek Dam, allowing AEB Route 1 to pass over. |
| Reservoir Area | Unknown |
| Downstream Development | The AEB Route 1 parallels Delta Creek for most of the route between the dam and King Cove. While approximately 1.2 miles to the South of Delta Creek, the King Cove Airport is downstream of the dam as well. The Water Pumphouse is the first structure downstream of the dam, approximately 0.25 miles downstream. There is no other development downstream of the dam. |
| General findings of the last inspection | There was no definitive inspection rating given to Waterfall Creek Dam during the 2025 inspection. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Waterfall Creek Dam. Based on the critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: City of King Cove Planning Team

#### G.4.1.3.2 History

There is no history of dam failure in King Cove.

#### G.4.1.3.3 Extent (Magnitude and Severity)

Heavy rainfall and flood events may affect the structural integrity of dams that would affect the King Cove. Other natural hazards that are less predictable/ forecastable, like landslides or earthquakes, can also impact the structural integrity of dams and could lead to failure. Poor or infrequent maintenance, seismic activity, and severe weather can also weaken the integrity of a dam.

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation for all dams in King Cove was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

See Figure G-3 for potential inundation area from Delta Creek Dam, Clear Creek Dam, and Waterfall Creek Dam and Figure G-4 for potential inundation area from Old Ram's Creek Dam.

Based on the most recent condition assessments and the criteria identified in Table 5 of the Base Plan, the magnitude and severity of dam failure in King Cove is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### G.4.1.3.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | While there are no historic dam failures near King Cove, changes in the Clear or Delta Creek bed could be an impact of a dam failure. have resulted in shaking of landscapes, there are no documented changes to King Cove's geography from past earthquakes. |
| Infrastructure | There are no recorded dam failure impacts on infrastructure in King Cove. |
| People | There are no documented cases of serious injuries, deaths, or health effects from dam failure in King Cove. |
| Utilities | While dam failure could impact electricity supply in King Cove, there have been no documented cases of dam failure causing utility disruptions in King Cove. |
| Transportation | The primary transportation related impacts from a dam failure in King Cove are aircraft and vehicle interruptions. Impacts to air transportation associated with dam failure are the potential for infrastructure damage to the Airport Terminal and Runway due to flooding, and flooding of roadways accessing the airport or other upland access. |
| Economy | There are no recorded economic impacts due to dam failure in King Cove. |
| Subsistence Resources | There have been no recorded cases of a dam failure in King Cove that has impacted the community's access to subsistence resources. |

#### G.4.1.3.5 Probability of Future Events

Based on the criteria listed in Table 6 of the Base Plan and the most recent condition assessments, it is **Possible** that King Cove will experience a dam failure event in the calendar year; the event is probable within the next five years, the event has up to 1 in 5-year (1/5=20%) chance of occurring. History of events is less than or equal to 20%.

However, the State of Alaska Dam Safety Engineer warned of "condition creep", where observational assessments of AEB dams have rated dams more poorly than their most recent available condition rating. If dams in King Cove continue to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### G.4.1.3.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in King Cove. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in King Cove. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in King Cove. A potential outcome of changing climate in Alaska is an increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in King Cove. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in King Cove. Increased precipitation and frequency of severe weather events could contribute to more stress on dams in King Cove. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in King Cove as residents may relocate in and out of potential future inundation areas. Residents of King Cove may also relocate out of the area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in King Cove. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted in inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in King Cove.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes.

### G.4.1.4 Earthquake

#### G.4.1.4.1 Location

The entire geography of King Cove is vulnerable to earthquakes, due to its location on the Alaska-Aleutian subduction zone.

According to the 2023 State of Alaska HMP, King Cove is located in an area with the potential of **severe perceived shaking from earthquakes (PGA 34 – 65)**. Perceived shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. This map focuses on the actual variations in shaking intensity across a region as felt by people and structures.

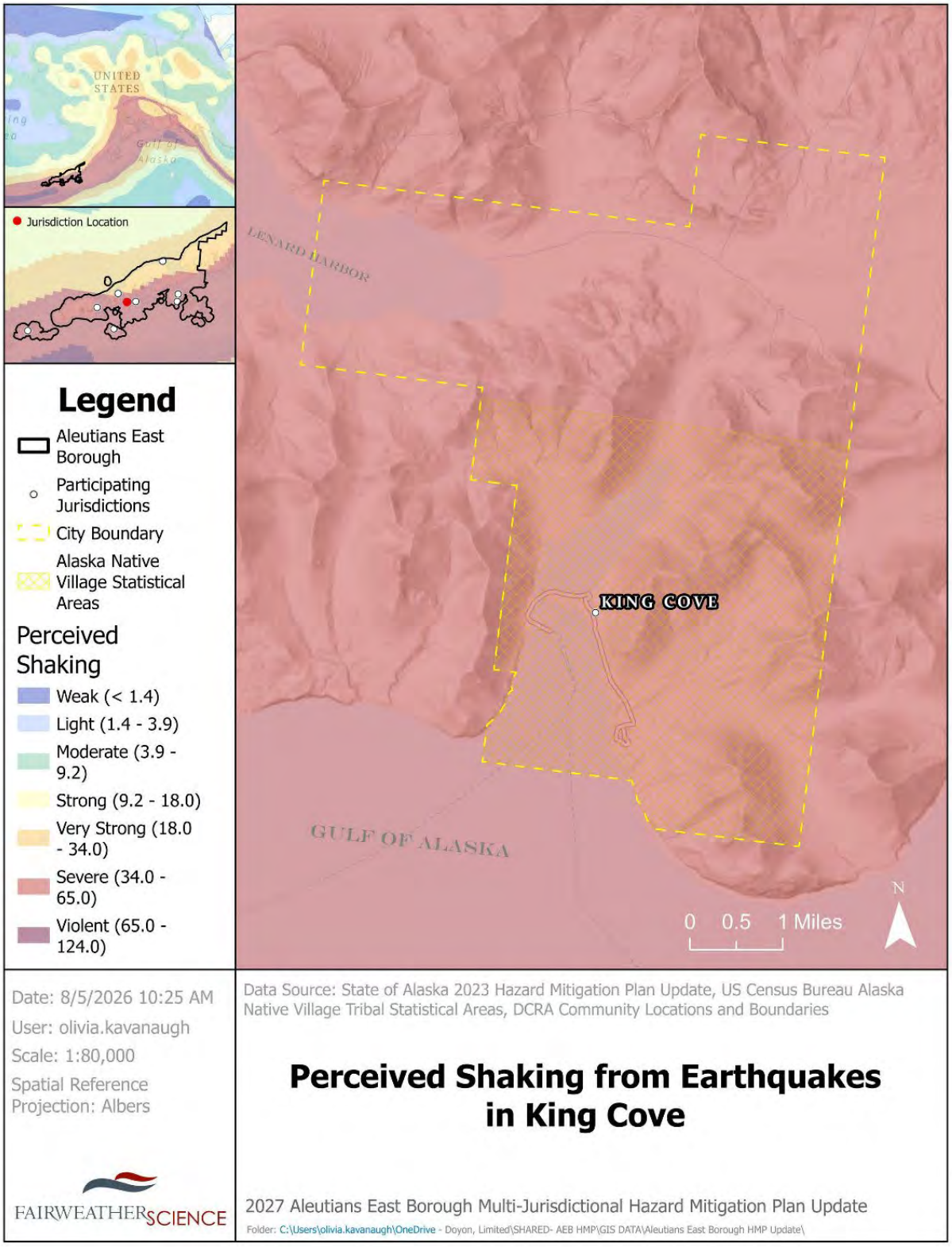



**Figure G-6 - Perceived Shaking from Earthquakes in King Cove**

#### G.4.1.4.2 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including King Cove can be found in Table 11 of the Base Plan.

On July 15, 2023, a powerful magnitude 7.2 earthquake occurred 50 miles south of Sand Point, causing up to 5-foot tsunami waves to be recorded in King Cove.

#### G.4.1.4.3 Extent (Magnitude and Severity)

Thousands of earthquakes occur each year along the Aleutian chain. Strong shaking has occurred historically in King Cove and can damage infrastructure and trigger tsunamis.

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding King Cove experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Based on the extent of past earthquakes and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in the King Cove is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### G.4.1.4.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | While historical earthquakes near King Cove have resulted in shaking of landscapes, there are no documented changes to King Cove's geography from past earthquakes. |
| Infrastructure | Historical earthquakes impacting King Cove have resulted in relatively minor physical damage to community infrastructure. |
| People | There are no documented cases of serious injuries or health effects from an earthquake in King Cove. Historical earthquakes have generally resulted in felt shaking and resultant hazards (tsunami warnings) rather than widespread harm to residents.<br>The July 16, 2025, Magnitude 7.3 earthquake was the most significant seismic event affecting King Cove in the past five years.<br>Effects in King Cove included:<br>• Strong shaking felt throughout the community.<br>• A tsunami warning was issued for the Alaska Peninsula.<br>• Residents evacuated to higher ground as a precaution.<br>• The warning was later downgraded and canceled.<br>• No significant injuries or structural damage were reported.<br>• Numerous aftershocks followed over the next several days. |
| Utilities | While strong shaking could damage utility equipment causing outages, there have been no documented cases of earthquakes causing utility disruptions in King Cove. |
| Transportation | The primary transportation related impacts from an earthquake in King Cove are aircraft and vehicle interruptions. Impacts to air transportation associated with earthquakes are the potential for infrastructure damage to the Airport Terminal and Runway as well as potential tsunami related |

| Description of Impact | |
|---|---|
| | impacts to floatplanes landing or taking off if a significant wave occurs during that time. Earthquakes of large magnitude have the potential to cause severe damage to roads and other transportation infrastructure. |
| Economy | There are no recorded economic impacts due to earthquakes in King Cove. |
| Subsistence Resources | There have been no recorded cases of an earthquake in King Cove that has impacted the community's access to subsistence resources. |

#### G.4.1.4.5 Probability of Future Events

King Cove is located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing the City of King Cove. During the past five years, the community experienced numerous earthquakes, including the July 16, 2025, magnitude 7.3 earthquake south of Sand Point, which generated strong ground shaking and a tsunami warning requiring precautionary evacuations. While no major damage occurred, the event demonstrated the community's continued exposure to significant seismic and tsunami hazards. Given King Cove's location along the Alaska-Aleutian subduction zone, future damaging earthquakes remain highly probable and continue to represent one of the City's greatest natural hazard risks.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that there will be an earthquake of any magnitude within 100 miles of King Cove within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and based on the history of events, the probability of occurrence is greater than 33% likely per year.

#### G.4.1.4.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of earthquake events in King Cove is not anticipated to change in the future. |
| Location | The location of earthquake events in King Cove is not anticipated to change in the future. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of earthquakes in King Cove. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of earthquakes in King Cove. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future earthquake events in King Cove. Earthquakes are impossible to predict. |
| Population Patterns | It is unlikely that future earthquakes will cause a change in population patterns in King Cove. |
| Land Use Development | Future climate conditions are not anticipated to influence Land Use Development due to earthquakes in King Cove. |
| Subsistence Resources | Future climate conditions are not anticipated to influence earthquake related impacts on subsistence resources in King Cove. |

### G.4.1.5 Flood

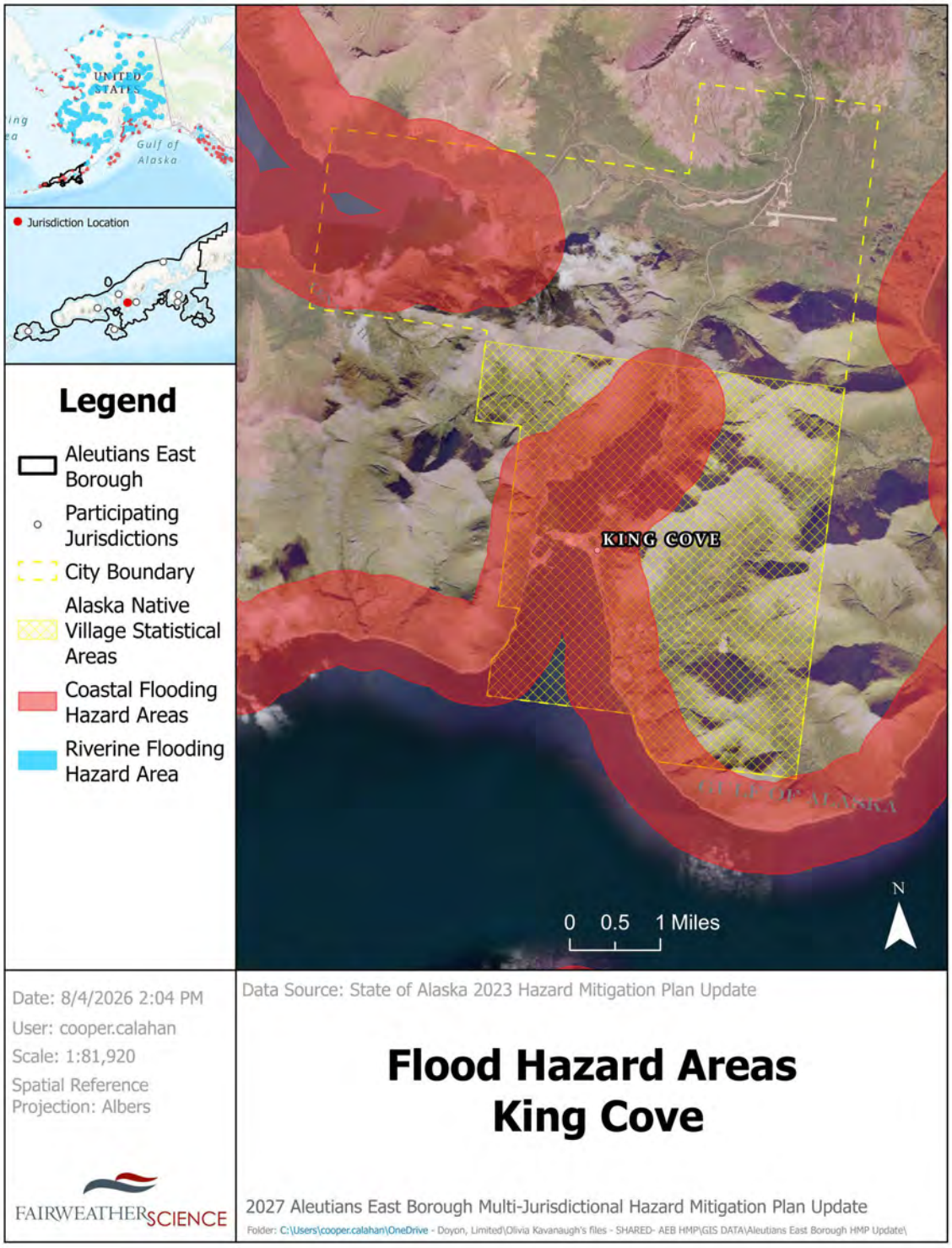
According to the Planning Team, King Cove is vulnerable to coastal flooding caused by storm surge, high tides, heavy rainfall, and wave action.

#### G.4.1.5.1 Location

According to the 2023 State HMP, King Cove is within the identified Coastal Flooding Area (Figure G-7). The State of Alaska identifies coastal flooding hazard areas of 0.5 miles from the coastline (DHS&EM 2023).

Due to the absence of major rivers, riverine flooding is not considered a significant hazard, according to the Planning Team. Historical flooding has generally been limited to localized inundation of low-lying coastal areas, harbor facilities, and roadways during severe North Pacific storms.

The Planning Team indicated that Rams Creek and W Lagoon Rd experience flooding when strong winds combine with high tide.




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure G-7- King Cove Flood Hazard Areas**

#### G.4.1.5.2 History

NOAA's National Water Level Observation Network includes a historic flood event in King Cove. This was a storm surge event that occurred on October 23, 1977. Its impact is pending assessment.

The Planning Team reports the following notable flood events:

| Date | Event | Impacts |
|---|---|---|
| November 1974 | Coastal storm surge | High surf and coastal flooding affected low-lying shoreline areas and harbor facilities. Minor damage reported. |
| November 2011 | Bering Sea Superstorm | King Cove experienced storm surge, high waves, and localized coastal flooding. Marine facilities and transportation were affected, but catastrophic damage did not occur. |
| December 2020 | North Pacific winter storms | High tides, heavy rain, and strong winds caused localized ponding, shoreline erosion, and temporary flooding of low-lying areas. |
| 2021-2026 | Multiple coastal storms | Several storms produced minor coastal flooding, wave overtopping, and temporary roadway flooding, but no federally declared disasters specific to King Cove have been recorded. |

According to the Aleutians East Borough Planning Team, W Lagoon Rd in King Cove experiences annual flooding related to the King Tide. During the 2025 event, flooding cut off a portion of W Lagoon Rd, which resulted in 30-40 people unable to access or leave their homes.



Source: AEB 2025

**Figure G-8- Flooding Along West Lagoon Rd in King Cove**

#### G.4.1.5.3 Extent (Magnitude and Severity)

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest has the lowest vulnerability.

King Cove tied for 59 out of 63 for flood threat ranking (Denali Commission 2019). While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking.

NOAA observed water levels in King Cove during a 2022 flood event reported 5 feet above the MHHW (Station 9459881).

The Alaska DGGS Coastal Hazards Program reports that they do not have flood extent data for the Aleutians East Borough or its communities.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding in King Cove is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### G.4.1.5.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team reported minor damage to low-lying shoreline areas in a coastal storm surge event in November 1974. Shoreline erosion occurred as a result of winter storm-driven flooding in December 2020. |
| Infrastructure | The Planning Team reported that a November 2011 flood event impacted marine facilities in King Cove. |
| People | The Planning Team did not report personal injury or death related to flooding in King Cove. |
| Utilities | The Planning Team did not report specific impacts to utilities due to flooding events in King Cove. |
| Transportation | The Planning Team reported that marine transportation was impacted in a November 2011 Bering Sea storm, which caused flooding. Multiple coastal storms in the last five years have caused temporary roadway flooding. |
| Economy | The Planning Team did not report specific economic impacts due to flooding events in King Cove. |
| Subsistence Resources | The Planning Team did not report specific impacts to subsistence resources due to flooding events in King Cove. |

#### G.4.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that King Cove will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### G.4.1.5.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |

| Description of Future Conditions | |
|---|---|
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in the Aleutians East Borough Planning Area as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br><br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in the Aleutians East Borough Planning Area is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in the Aleutians East Borough Planning Area, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in the Aleutians East Borough Planning Area. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br><br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br><br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021).<br><br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in the Aleutians East Borough Planning Area, however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |
| Population Patterns | It is possible that future flood events will cause changes in population patterns in the Aleutians East Borough Planning Area as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### G.4.1.6 Ground Failure/Landslide

#### G.4.1.6.1 Location

The King Cove area is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity.

The King Cove area has underwater locations that display signs of submarine landslides. Further research is needed to map more areas of the sea floor to determine past and potential future submarine landslides.

Many landslide paths coincide with avalanche paths, especially at higher elevations. Unmapped areas within the Borough remain to be studied for landslide hazards and will be included in future updates of this plan as resources become available to evaluate those areas for landslide hazards.




**Figure G-9 - Historical Landslide Events Near King Cove**

#### G.4.1.6.2 History

According to the Alaska DGGS Library, there are seven (7) recorded landslides in the vicinity of King Cove, and one (1) recorded land flow in the vicinity of King Cove.

In 2021, King Cove residents stated that an avalanche occurred over 50 years ago and carried a house down the slope to the beach. An *Anchorage Daily Times* article of 1960 describes an event in which a dwelling in King Cove was flattened by strong winds during a snow storm at approximately 10 p.m. on January 19, 1960. Five young children and one adult died during this event. In the article, their deaths are attributed to exposure while pinned under the wreckage of their home, which was blown over by winds of about 60 knots. The temperature was reported to be 18 degrees F at the time. While the news report cites wind as the cause of the damage, people in King Cove report that it was a mud and rock avalanche on Ram's Creek Road which continued past the house and reached the bay.

According to the City of King Cove, in 2025, there were numerous landslides between Cold Bay and King Cove, as well as on the other side of the bay from King Cove.

The April 1st, 1946, earthquake near Unimak Island (approximately 42 m east of Akutan, 35 miles west of Cold Bay and 45 miles east of King Cove) created a tsunami wave that reached all the way to Antarctica. For years, speculation existed that the large tsunami was aided by a submarine landslide due to the disproportionate waves created by the earthquake. In 1996, the USGS GLORIA discovered numerous slope failures (historic submarine landslides) along the eastern Aleutian Shelf. An exceptionally large failure was found at the location of the now named Ugamak Slide (Fryer, Watts, Patson 2004). The Ugamak Slide consists of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

If the Ugamak Slide did indeed occur on April 1st, 1946, it is likely that much of the seismic motion, especially at longer periods, was from the slide itself. A tectonic shock – a shallow subduction earthquake – was probably the trigger but differentiating it from the rest of the motion may prove impossible. The evidence for a landslide source to the 1946 tsunami is substantial (Fryer, Watts, Patson 2004).

#### G.4.1.6.3 Extent (Magnitude and Severity)

There have been seven (7) recorded landslides and one (1) recorded debris flow in the vicinity of King Cove. The Alaska Landslide Inventory Database provided no additional information outside of deciphering the landslides from the debris flow (DGGS 2026). Subaerial landslides on sloped terrain in the City of King Cove pose a threat to critical facilities or human life. Subaerial landslides near bodies of water also pose a threat to critical facilities or human life in the Planning Area as they may trigger a tsunami or seiche.

Landslides have been documented near bodies of water in King Cove- these events have the possibility to produce a tsunami or seiche. Ongoing monitoring and modelling of these areas is needed to identify if future subaerial landslides have the potential to trigger a tsunami. More information about tsunamis and seiches can be found in Section 3.2.10 in the Base Plan.

Based on the Alaska Landslide Inventory Database, it can be estimated that the historical landslides recorded in King Cove range in width of less than 100 feet to over 500 feet.

A landslide (both submarine and subaerial) can trigger a tsunami. Due to King Cove's location near the Pacific Ocean, and exposure to the open ocean, a submarine landslide-induced tsunami affecting the Planning Area in the future is a possibility. In the past, submarine landslides created secondary hazards (tsunamis), that have impacted the City of King Cove.

The largest discovered underwater landslide deposit in the Aleutians East Borough is the Ugamak Submarine Slide. The Ugamak Submarine Slide consisted of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

There have been no documented landslides in the jurisdiction of King Cove, however the City of King Cove reported that there were numerous landslides in 2025. These slides damaged hillsides and roadways leading between Cold Bay and King Cove. Some of these slides also damaged hillsides and roadways across the bay from King Cove.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of landslides in King Cove is considered **Limited**, with the potential for injuries and/or illnesses that do not

result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### G.4.1.6.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | There are anecdotal reports from the City of King Cove detailing steep slopes near the roadways to Cold Bay and across the bay. These hillsides were impacted by landslides and are presumably more prone to another slide or an avalanche. |
| Infrastructure | There are anecdotal reports of roadways being damaged by landslides in 2025. The roads leading to Cold Bay, and across the bay from King Cove were covered by landslides. Landslides could impact other roadways in the future and could damage structures near steep slopes. A submarine landslide induced tsunami could damage infrastructure along the coastline as well. Critical facilities at risk of landslide impacts include the Alaska Commercial Company and the Silver Bay Stock Room. |
| People | There are no reports of injuries or fatalities due to landslides in King Cove. Injuries or deaths could be caused by landslides due to tsunami waves or debris and soil/earth burying or hitting individuals with force. |
| Utilities | There are no reports of utility disruptions due to landslides in King Cove. Underground water, sewer, and electric lines could be damaged by earth movement. |
| Transportation | Road travel to Cold Bay, and across the bay from King Cove were impacted by landslides in 2025. This could happen again in the future, as well as air travel being limited by runway surfaces being damaged or covered by landslide debris. A submarine landslide could cause a tsunami and inundate the runway or roadways leading to the airport. |
| Economy | There are no reported impacts to the local economy due to landslides in King Cove. |
| Subsistence Resources | There are no reported landslide impacts on subsistence resources in King Cove. |

#### G.4.1.6.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that King Cove will experience a landslide event in the calendar year. There is a 1 in 5 years chance of occurring (1/5 = 20%), and the history of subaerial landslide events is greater than 10% but less than or equal to 20% per year.

#### G.4.1.6.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of landslides in the future in King Cove. |
| Location | It is possible that future climate conditions will influence the location of future landslides in King Cove. Landslide probability is location specific, and numerous variables must be considered. It is common for debris flows to recur in the same channel or to shift slightly. Other types of landslides may reoccur in the same place or the area directly adjacent to a previous landslide. King Cove is in a highly seismic area, which can trigger landslides at any time, and create areas prone to landslides that did not used to be.<br>Ground failures related to more frequent severe weather events, an increase in atmospheric rivers, and potential droughts are expected to appear in locations that |

| Description of Future Conditions | |
|---|---|
| | were previously frozen and are now thawing. This includes areas that are immediately adjacent to recently thawed ground and where overlying vegetation has been removed. However, landslides also occur in areas with no prior known instabilities due to changing conditions such as increased rainfall, strong earthquake shaking, and human activities (DHS&EM 2023). |
| Extent (Magnitude and Severity) | It is likely that future climate conditions will influence the magnitude of future landslides in King Cove. Landslides are expected to increase in magnitude with increased areas of effect as severe weather events increase in frequency (IPCC 2019).<br>Future climate conditions are expected to increase landslide frequency of all intensities, and as people develop across the landscape, including into hazardous areas, there will likely be an increase in more significant outcomes in the future (DHS&EM 2023). |
| Impact | It is likely that future climate conditions will influence the impact of future landslides in King Cove. Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from an increase in atmospheric rivers, severe weather events, and glacial decline (IPCC 2019), which could increase future ground failure events and resultant impacts. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of future landslides in King Cove. Although the probability of ground failure is location-specific, it is likely, and increasing, due to a changing climate. Severe weather events such as precipitation and wind are a direct result of atmospheric warming. Atmospheric rivers are becoming increasingly common and increase the intensity and duration of precipitation events at regional and local scales. Landslide events are directly related to high intensity precipitation events, and those are likely to become more common over greater geographic regions of Alaska (DHS&EM 2023). |
| Population Patterns | It is possible future climate conditions will influence population patterns in King Cove. King Cove is experiencing a slight increase in population as an overall trend. Since 2020, the population has increased 0.5% annually, from 757 to 784 (US Census 2026). This may eventually mean more of the resident population living in landslide hazard areas, however an increased growing season due to future climate conditions could lengthen the tourist season. An increase in tourists throughout the year could possibly increase the number of people that are at risk of landslide hazards at any given moment. |
| Land Use Development | It is possible future climate conditions will influence future land use development in King Cove. Limiting development and relocating existing development outside of landslide hazard areas would change the development in these areas. A landslide warning system could require infrastructure development, and more development outside of the landslide zones could increase land use to accommodate displaced residents. It is also possible that land developed in the future, or that has already been developed, may eventually become prone to landslide hazards. |
| Subsistence Resources | It is possible that future climate conditions will result in landslides impacting subsistence resources. Landslides could wipe out land access to certain parts of coastline, berry gathering locations, or trails leading to hunting or fishing grounds. |

### G.4.1.7 Invasive Species

#### G.4.1.7.1 Location

The entire natural area surrounding King Cove is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. King Cove's location adjacent to a busy coastal port is the primary human-caused pathway in the spread of invasive species in the region.

In King Cove, several species of invasive terrestrial plants and animals have been documented, including:

- Tall Buttercup
- Orange Hawkweed
- Creeping Buttercup
- Smooth Brome
- Oxeye Daisy
- European Mountain Ash
- European Black Slug

Figure G-10 depicts the locations of documented invasive terrestrial plant species in King Cove, as reported by community members in the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database.

Note that the "downtown" area may have more documented invasive species sightings than other areas of the community due to its higher population density and greater likelihood of observation and reporting. Therefore, the number of reported sightings may not necessarily reflect the actual distribution or abundance of invasive species across the community.

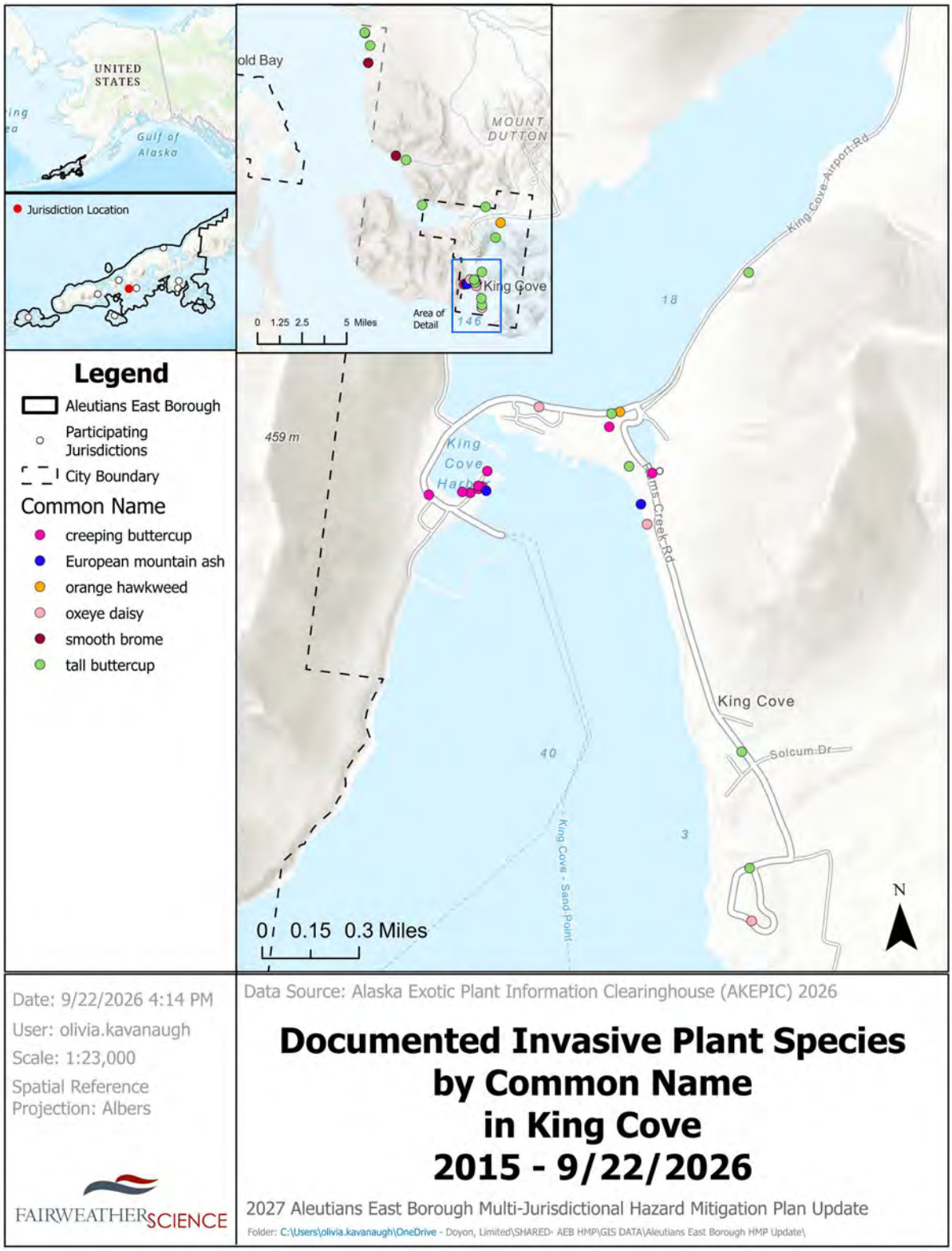



**Figure G-10- Documented Invasive Plant Species by Common Name in King Cove**

#### G.4.1.7.2 History

King Cove has had historical vessel traffic related to the fishing and shipping industry, which has contributed to the spread of invasive species in the region. While there have been no historical occurrences of invasive rats or invasive aquatic animals in the community, King Cove has had a history with the spread of invasive terrestrial plants. While there are documented occurrences of invasive plants in King Cove, the exact timeline of arrival is difficult to confirm.

According to a Planning Team member, European Black Slugs are widespread throughout King Cove, with reports of the slugs' infiltrating gardens and areas along local roads.

#### G.4.1.7.3 Extent (Magnitude and Severity)

Although damages to the lands surrounding King Cove from invasive species has been limited, there are several non-native plants with a high invasiveness that have occurred near the community.

Table G-1 displays the non-native plant occurrences that have occurred within King Cove. A total of 53 acres have been infested by invasive terrestrial plants in King Cove.

**Table G-1- Non-Native Plant Occurrences in King Cove**

| Invasive Plant Species | Total Infested Area (acres) | Invasiveness Ranking (0-100) |
|---|---|---|
| **Tall Buttercup** | 52.03 | 60 |
| **Orange Hawkweed** | 1.001 | 79 |
| **Creeping Buttercup** | 0.142 | 72 |
| **Smooth Brome** | 0.12 | 62 |
| **Oxeye Daisy** | 0.03 | 61 |
| **European Mountain Ash** | 0.011 | 65 |
| **Grand Total** | **53.334 acres** | **Maximum Ranking: 79** |

**While invasive species are a concern for many communities, at this time, the presence of these species is not impacting critical facilities.**

Based on previous occurrences and the criteria identified in Table 5 of the Base Plan, the magnitude and severity to King Cove from invasive species are considered **Limited**.

#### G.4.1.7.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of invasive species on the land surrounding King Cove has been localized non-native plant infestations, which can outcompete native plants and wildlife. |
| Infrastructure | There is limited evidence that invasive species have directly impacted infrastructure in King Cove. |
| People | While invasive species can affect resources that people depend on, King Cove has no history of invasive species directly affecting the residents of the community. |
| Utilities | There have been no documented cases of invasive species causing utility disruptions in King Cove. |
| Transportation | Transportation is identified as a major pathway for invasive species to spread throughout King Cove. Due to the nature of invasive species in the community, |

| Description of Impact | |
|---|---|
| | there is little evidence to show that these species cause direct damage to transportation infrastructure in King Cove. |
| Economy | There have been no reports of an invasive species infestation resulting in significant economic impacts in King Cove. |
| Subsistence Resources | Invasive species pose a potential threat to subsistence resources in King Cove. Species like the European Black Slug are known to feed on plants and berries, a key aspect to subsistence culture for the community. |

#### G.4.1.7.5 Probability of Future Events

Based on previous occurrences, and the criteria identified in Table 6 of the Base Plan, it is **Likely** that King Cove will experience an invasive species event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### G.4.1.7.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is possible future climate conditions will influence the nature of invasive species in King Cove. Warmer temperatures and longer growing seasons may allow some invasive species to become established in areas where they don't historically occur. |
| Location | It is likely future climate conditions will influence the location of invasive species in King Cove. Changes in temperature and precipitation patterns may allow invasive species to expand into new terrestrial and marine areas of King Cove. |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of invasive species in King Cove. Future changes may create favorable conditions for certain invasive species, allowing populations to spread at a rapid rate. |
| Impact | It is likely future climate conditions will influence the impacts of invasive species in King Cove. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of invasive species in King Cove. As environmental conditions change, areas that were previously unsuitable for certain invasive species may become more favorable for establishment and spread, which increases the probability of future events in King Cove. |
| Population Patterns | It is possible future climate conditions will influence population patterns in King Cove. Changes in the distribution and abundance of invasive species may alter the availability of food and habitat relied upon by wildlife and residents of King Cove. |
| Land Use Development | It is unlikely future climate conditions will influence future land use development in King Cove. |
| Subsistence Resources | It is likely future climate conditions will influence subsistence resources in King Cove. Changes in ocean conditions, weather patterns, and species distribution may affect the availability and accessibility of important subsistence resources. The introduction or expansion of invasive species could further impact native species that support subsistence activities in King Cove. |

### G.4.1.8 Sediment Deterioration and Land Destabilization

#### G.4.1.8.1 Location

Sediment deterioration and land destabilization can occur throughout King Cove, with coastal land destabilization being the biggest concern for the community. Since King Cove is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surges, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.

Riverine sediment deterioration and land destabilization is not identified as a concern for the community.

While the extent of sediment deterioration and land destabilization in King Cove varies by location, facilities across the bay and the area surrounding the King Cove Road may be increasingly vulnerable to future destabilization.

#### G.4.1.8.2 History

The history of coastal sediment deterioration and land destabilization in King Cove varies by location due to the localized nature of storms in the community. According to a 2007 USACE study, erosion occurs along Gould's Lagoon shoreline and that the roadway connecting the Old Ram and New Ram subdivisions is the most vulnerable.

Additionally, it has been reported that the runway at the King Cove Airport experiences soft conditions, particularly during spring breakup and prolonged periods of heavy rain (AirNav 2026).

Another concern in the community is potential sediment deterioration and land destabilization stemming from construction and operation of the USACE-approved King Cove to Cold Bay Road. Since much of the proposed road travels through protected wetlands, the required use of drainage culverts could lead to sediment deterioration and contribute to land destabilization over time (USFWS 2025).

#### G.4.1.8.3 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of sediment deterioration and land destabilization vary throughout select communities.

In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk. King Cove was categorized in Erosion Group 3, which places it at a lower risk of sediment deterioration and land destabilization according to the study.

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the extent of land destabilization in King Cove is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### G.4.1.8.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding King Cove has been damages to shoreline and beaches, particularly along areas exposed to waves and storms.<br>In the community, impacts from destabilization has been documented near on roads near critical facilities like the harbor. |
| Infrastructure | Sediment deterioration and land destabilization impacts in King Cove have been documented near the airport runway. Continued land destabilization could threaten additional community infrastructure and increase mitigation costs. |

| | Description of Impact |
|---|---|
| People | While sediment deterioration and land destabilization can affect residents of King Cove by threatening homes and access to subsistence areas, direct impacts to people in King Cove resulting from land destabilization have been limited. |
| Utilities | There have been no documented impacts to the utilities in King Cove from sediment deterioration and land destabilization events. |
| Transportation | The primary transportation related impacts from a sediment deterioration and land destabilization event in King Cove are damage to roads, boardwalks, and other transportation infrastructure. There have been no reports of land destabilization resulting in substantial disruptions to transportation in King Cove. |
| Economy | There are a substantial number of roads in King Cove that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities. |
| Subsistence Resources | A primary concern related to subsistence resources in King Cove is the loss of subsistence fish camps that have been used for generations, which have the potential to be washed-out or the access restricted during a storm. |

#### G.4.1.8.5 Probability of Future Events

The low-lying geography influences the likelihood of continued sediment deterioration and land destabilization in King Cove.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that King Cove will experience a sediment deterioration and land destabilization event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### G.4.1.8.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in King Cove. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in King Cove. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal land destabilization in King Cove (AK DGGS 2026). |
| Extent (Magnitude/Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in King Cove. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in King Cove. Projected increases in precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |

| Description of Future Conditions | |
|---|---|
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in King Cove. Although the probability for land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |
| Population Patterns | It is possible future climate conditions will influence population patterns in King Cove. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of King Cove entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in King Cove. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in King Cove. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

### G.4.1.9 Severe Weather

#### G.4.1.9.1 Location

All of King Cove is vulnerable to severe weather events.

#### G.4.1.9.2 History

**The Planning Team reported that King Cove experiences some of the most severe winter storms in Alaska because of its location on the Pacific side of the Alaska Peninsula.** The community is frequently affected by powerful North Pacific low-pressure systems that produce hurricane-force winds, heavy snow, freezing rain, blizzard conditions, and coastal flooding. While not every storm is individually named, several major winter storms have significantly affected the community.

The Planning Team provided the following historic winter storm information.

**Table G-2- Historic Winter Storms in King Cove Provided by Planning Team**

| Date | Event | Impacts |
|---|---|---|
| January 1971 | Major Aleutian Winter Storm | Hurricane-force winds caused damage to buildings, utilities, and harbor facilities throughout the Alaska Peninsula. |
| December 1987 | Severe Bering Sea Storm | Winds exceeded 80 mph with heavy snow and coastal flooding. Transportation was disrupted for several days. |
| November 2004 | Strong North Pacific Storm | High winds, heavy precipitation, and coastal flooding affected the Alaska Peninsula, including King Cove. |
| November 2011 | Bering Sea Superstorm | Although the worst impacts occurred farther north, King Cove experienced storm-force winds, high surf, and significant marine impacts. |
| December 2020 | Multiple Gulf of Alaska Storms | High winds, heavy rain, snow, and hazardous marine conditions caused transportation delays and power interruptions across the Alaska Peninsula. |
| Winter 2023–2024 | Repeated North Pacific Storms | Multiple storms brought strong winds, heavy precipitation, rough seas, and flight cancellations affecting King Cove and surrounding communities. |

The Planning Team reported that a cold snap in January-February 2009 impacted King Cove. King Cove also experienced below-normal temperatures in the winter of 2022-2023, producing dangerous wind chills and hazardous travel conditions. The Planning Team reported that the winter of 2025-2026 was prolonged and cold.

The Planning Team provided the following list of significant snowstorms affecting King Cove.

| Date | Event | Impacts |
|---|---|---|
| January 2001 | Major Alaska Peninsula Winter Storm | More than 12 inches of snow in about 12 hours fell in parts of the Alaska Peninsula. King Cove experienced hurricane-force wind gusts approaching 135 mph, creating blizzard conditions, transportation disruptions, and structural damage in the region. |
| December 2007 | Winter Storm | Heavy snow combined with wind gusts of approximately 75 mph damaged roofs and buildings in both King Cove and Cold Bay. |
| Winter 2020–2021 | Multiple Winter Storms | A series of storms brought periods of heavy snow, blowing snow, high winds, and interruptions to air and marine |

| Date | Event | Impacts |
|---|---|---|
| | | transportation throughout the eastern Aleutians and Alaska Peninsula. |
| Winter 2023–2024 | Repeated Winter Storms | Several storms produced snowfall, blowing snow, and strong winds, resulting in hazardous travel, flight cancellations, and dangerous marine conditions. |
| Winter 2025–2026 | Multiple Snow Events | Several snowstorms affected the Alaska Peninsula with periods of accumulating snow and blowing snow that disrupted travel and airport operations. |

#### G.4.1.9.3 Extent (Magnitude and Severity)

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather in King Cove is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### G.4.1.9.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team did not report specific impacts to geography/land related to severe weather in King Cove. |
| Infrastructure | The Planning Team reported that hurricane-force winds in winter 1971 caused damage to buildings and harbor facilities. |
| People | The Planning Team did not report specific personal injury or death related to severe weather in King Cove. |
| Utilities | The Planning Team reported that hurricane-force winds in winter 1971 caused damage to utilities. They reported that multiple storms in the Gulf of Alaska in December 2020 caused power interruptions. In the 1989 cold snap, fuel lines froze and heating systems failed. Some residents were forced to improvise fuel delivery systems to heat their homes. Winter storms have resulted in occasional power outages. |
| Transportation | The Planning Team reported that transportation was disrupted for several days during a November 2004 Pacific storm. They reported marine impacts during a Bering Sea Superstorm in November 2011. Transportation delays were experienced due to storms in December 2020. Flight cancellations and rough seas were reported during repeated North Pacific storms in the winter of 2023-2024. Winter storms have resulted in hazardous travel conditions, airport closures, and marine transportation disruptions. |
| Economy | The Planning Team did not report specific impacts to the local economy related to severe weather in King Cove. |
| Subsistence Resources | The Planning Team reported that salmon berry bushes were impacted by the extremely cold winter in early 2026 in King Cove. |

#### G.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that King Cove will experience a severe weather event (dense fog, extreme cold, heavy rain, heavy snow, or high winds), within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### G.4.1.9.6 Future Climate Conditions

***Note- Specific climate modelling was not available for King Cove. Data for nearby Belkofski is used as a representation for future conditions in King Cove.***

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in King Cove. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in King Cove. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in King Cove. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in King Cove. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in King Cove. | It is unlikely that future climate conditions will influence the nature of future high wind events in King Cove. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in King Cove. | It is possible that future climate conditions will influence the location of future drought/water supply events in King Cove. | It is unlikely that future climate conditions will influence the location of future extreme cold events in King Cove. | It is unlikely that future climate conditions will influence the location of future heavy rain events in King Cove. | It is unlikely that future climate conditions will influence the location of future heavy snow events in King Cove. | It is unlikely that future climate conditions will influence the location of future high wind events in King Cove. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in King Cove could increase (UAF/SNAP 2025). | In Belkofski, and likely in King Cove given its proximity, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+9°F) in Belkofski, with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). Trends are anticipated to be very similar in King Cove given its proximity to Belkofski.<br>Climate change within Alaska is likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In Belkofski and therefore also King Cove given its proximity, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in King Cove. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP).<br>Extreme precipitation events have occurred throughout Alaska with increasing frequency.<br>In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>King Cove experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months. Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). |
| Impact | Projected increases in precipitation and associated moisture availability in King Cove could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026).<br>Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in King Cove are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities in the Aleutians East Borough (Alaska DHS&EM 2023). | While overall temperature trends in Belkofski, and given its proximity also in King Cove, are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In Belkofski and by proximity King Cove, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026). It should be noted that precipitation modeling is not available for King Cove specifically.<br>As precipitation increases, impacts associated with heavy rainfall (localized flooding, landslide potential, roadway washouts, etc.) will increase. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | levels.<br>The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in King Cove by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in King Cove are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>Precipitation modeling is not specifically available for King Cove, however in Belkofski, winter is likely to have more precipitation (+24%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in Belkofski, and by proximity King Cove, are projected to increase, with estimated spring temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In King Cove, winter is likely to have more precipitation (UAF/SNAP 2026).<br>Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in King Cove may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in King Cove have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in King Cove. | Future conditions of drought are not anticipated to significantly affect population patterns in King Cove. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in King Cove. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | It is not likely that future conditions influencing heavy rain will impact changes in King Cove population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in King Cove population patterns. | It is not likely that future conditions influencing high winds will impact changes in King Cove population patterns. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in King Cove. | Future conditions of drought are not anticipated to substantially affect future land use development in King Cove. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in King Cove, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in King Cove population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in King Cove land use development. | It is not likely that future conditions of high winds will impact changes in King Cove population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in King Cove. | Future conditions of drought may affect subsistence resources in King Cove, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | Future conditions of extreme cold may affect subsistence resources in King Cove, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | It is possible that future conditions of heavy rain will impact changes in King Cove land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above King Cove, leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to development of landslide | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, | It is not likely that future conditions of high winds will impact changes in King Cove land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | monitoring equipment and/or landslide barriers/diversion structures. | thermal stress, and nutrient availability for subsistence species. | |

**Projected Conditions for King Cove**

A change summary narrative was not available for King Cove. However, a change summary narrative was available for Belkofski, which is located approximately 12 miles from King Cove. This information is used as proxy for King Cove.

In Belkofski, average annual temperatures may increase by about 9°F by the end of the century. Given its proximity to King Cove, average temperatures can be expected to act similarly there.

Spring temperatures are projected to increase the most (+9°F).

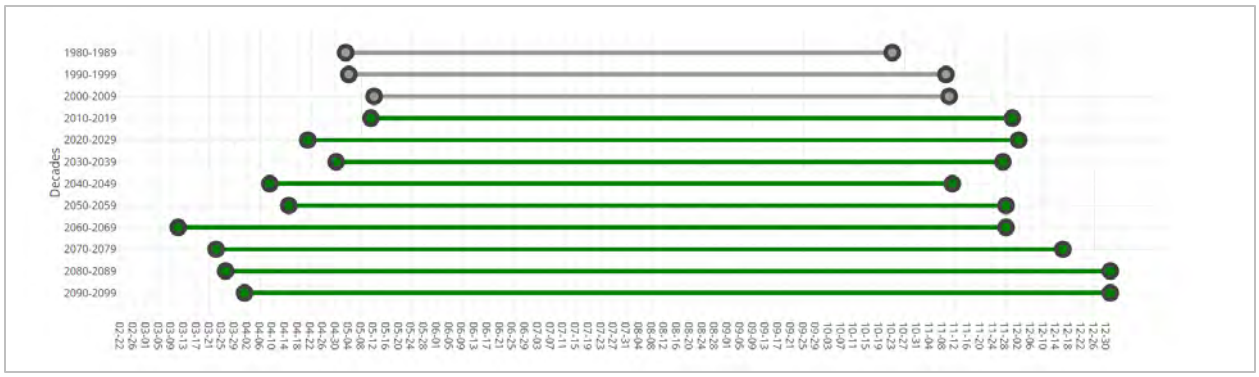
Winter may transition from below freezing to above freezing in the future.

Models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+24%).

In the past, this area had very low flammability. Future flammability may be about the same.

*Source: UAF/SNAP- Northern Climate Reports*

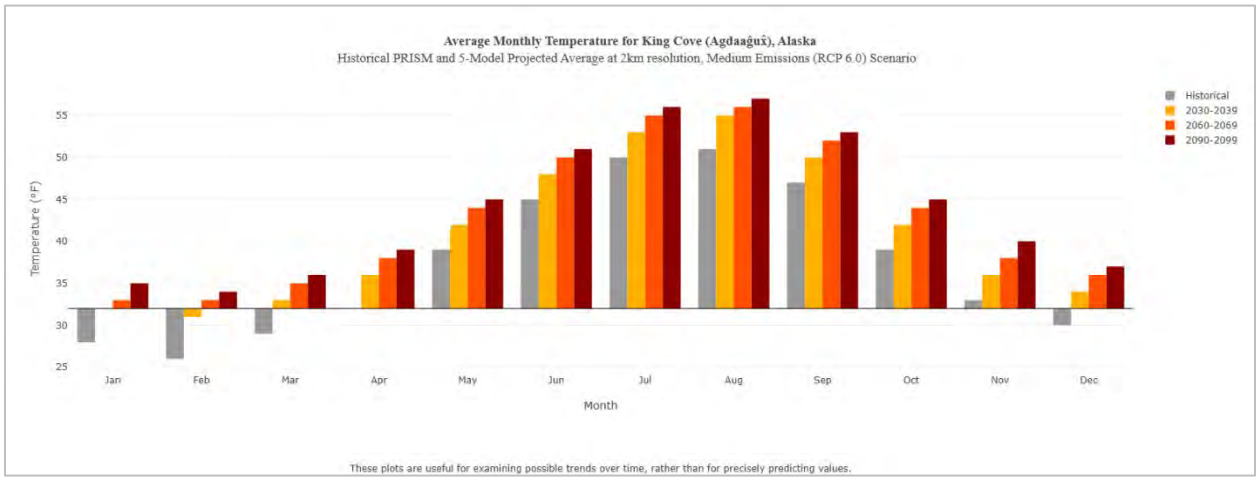
Figure G-11 models historical and future duration of the growing season in King Cove from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure G-11- Historical and Future Projected Changes in Growing Season in King Cove (1980-2099)**

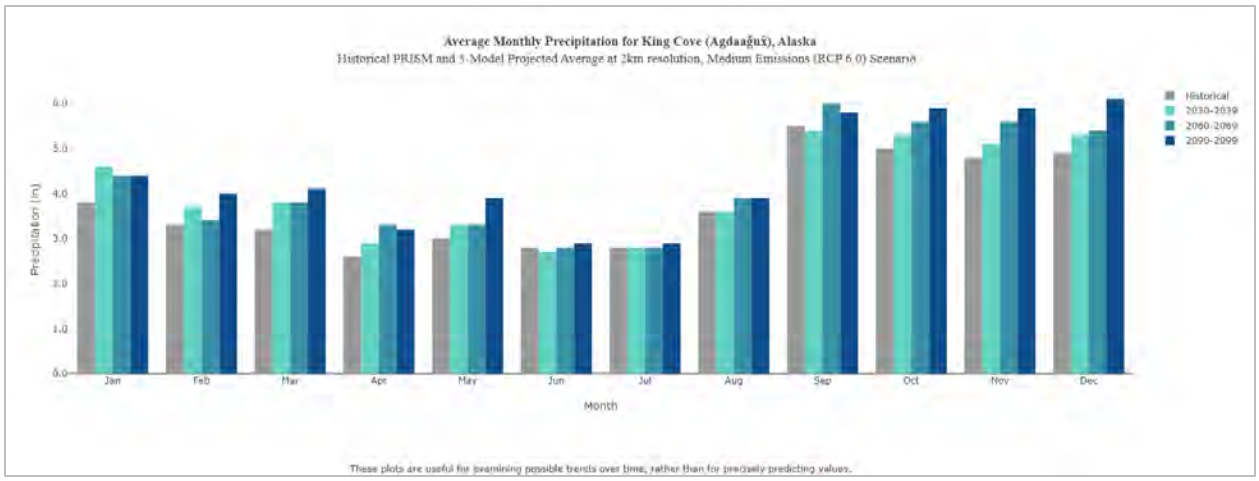
Figure G-12 models historical and future average monthly temperatures in King Cove from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure G-12- Historical and Future Projected Average Monthly Temperature in King Cove (1980-2099)**

Figure G-13 models historical and future average monthly precipitation in King Cove from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure G-13- Historical and Future Projected Average Monthly Precipitation in King Cove (1980-2099)**

### G.4.1.10 Tsunami

#### G.4.1.10.1 Location

Most critical facilities and infrastructure in King Cove are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community (Figure G-14).

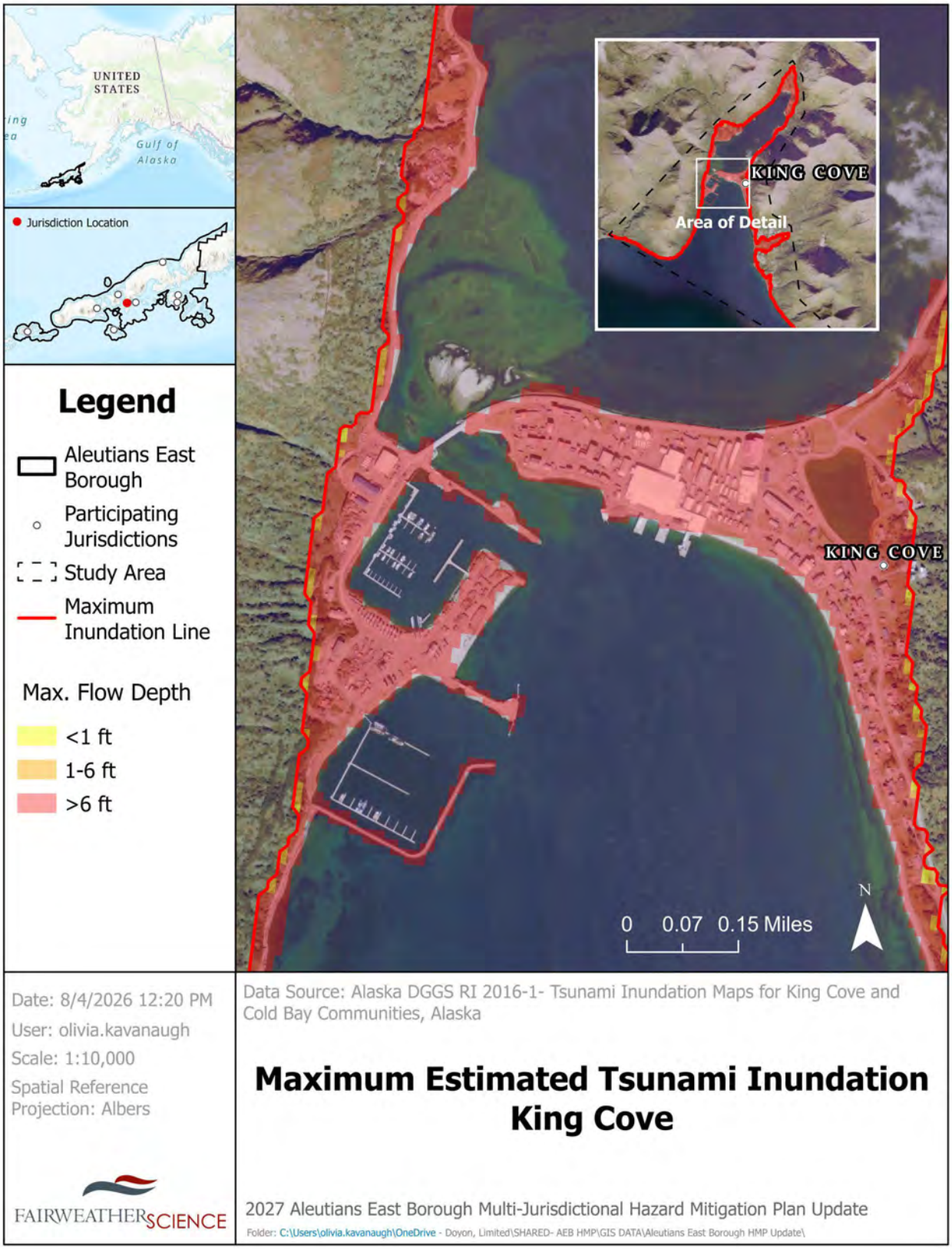



**Figure G-14- Tsunami Inundation Map, King Cove**

### G.4.1.10.2 History

King Cove is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. See Table 17 in the Base Plan for a comprehensive list from the NOAA National Centers for Environmental Information (NCEI) detailing the earthquake-generated tsunamis with observed or measured waves throughout the Planning Area.

Since 1788, there have been 15 documented tsunami runup events in King Cove. The most recent runup event in Sand Point was recorded in July 2025.

Since 2021, there have been two tsunami warnings issued for King Cove.

- July 29, 2021 (M8.2 Chignik earthquake)
- July 16, 2025 (M7.3 south of Sand Point earthquake)

**Table G-3 - Historic Tsunami Runups, King Cove (1788 – August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 15 | 1946-04-01 | KING COVE, AK | EQ + LS | 8.6 | 4.92 |
| 58 | 2006-05-03 | KING COVE, AK | EQ | 8 | 0.23 |
| 61 | 2006-11-15 | KING COVE, AK | EQ | 8.3 | 0.66 |
| 63 | 2009-09-29 | KING COVE, AK | EQ | 8.1 | 0.43 |
| 64 | 2010-02-27 | KING COVE, AK | EQ | 8.8 | 2.07 |
| 68 | 2011-03-11 | KING COVE, AK | EQ | 9.1 | 1.77 |
| 75 | 2014-04-01 | KING COVE, AK | EQ | 8.2 | 0.33 |
| 77 | 2015-09-16 | KING COVE, AK | EQ | 8.3 | 0.85 |
| 81 | 2020-10-19 | KING COVE, AK | EQ | 7.6 | 2.10 |
| 84 | 2021-07-29 | KING COVE, AK | EQ | 8.2 | 0.72 |
| 86 | 2021-08-12 | KING COVE, AK | EQ | 8.1 | 0.62 |
| 88 | 2022-01-15 | KING COVE, AK | VO | N/A | 3.28 |
| 90 | 2023-07-16 | KING COVE, AK | EQ | 7.2 | 0.49 |
| 93 | 2025-07-16 | KING COVE, AK | EQ | 7.3 | 0.26 |
| 95 | 2025-07-29 | KING COVE, AK | EQ | 8.8 | 1.51 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

**April 1946 Aleutian Islands Earthquake and Tsunami**

The 1946 Aleutian Islands earthquake and tsunami struck on April 1, 1946, triggered by a powerful magnitude 8.6 undersea earthquake in the Aleutian Trench off Unimak Island, Alaska, which sent devastating Pacific-wide waves that resulted in a handful of deaths in Alaska and 159 deaths in Hilo, Hawaii.

The tsunami completely obliterated the steel-reinforced concrete Scotch Cap Lighthouse on Unimak Island (in the Aleutians East Borough, approximately 60 miles east of Akutan) and killed all five Coast Guard keepers (National Coast Guard Museum 2024).

Community oral history provided through the City of King Cove adds local context to the documented 1964 tsunami. King Cove elders recalled tsunami-related seawater rising to the community boardwalk following the 1964 Great Alaska Earthquake. While the earthquake-generated tsunami is independently documented, the reported extent of seawater at the boardwalk is retained as community oral history.

Tsunami run-up of nearly 5 feet was recorded in King Cove due to this event.



Source: National Coast Guard Museum 2024

**Figure G-15- Scotch Cap Lighthouse: Before and After the 1946 Tsunami**

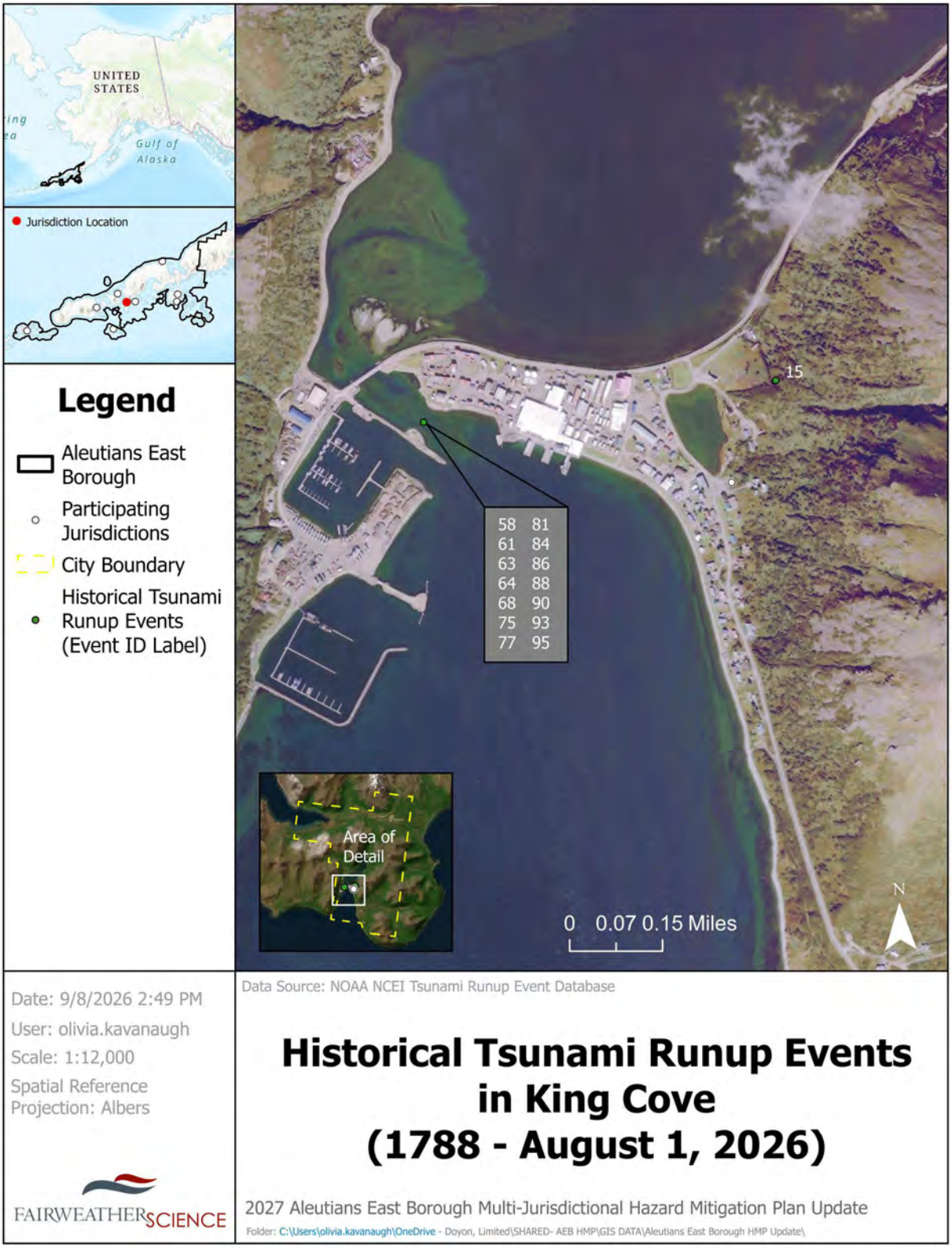



**Figure G-16- Historical Tsunami Runup Events in King Cove (1788 – August 1, 2026)**

#### G.4.1.10.3 Extent (Magnitude and Severity)

King Cove has experienced tsunami run up events from less than 1 foot to nearly 5 feet.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in King Cove is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### G.4.1.10.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | While King Cove is located in a tsunami-prone region, there is little evidence that historical tsunamis have reshaped the community's overall landscape. Changes to the landscape in King Cove from tsunami events tend to be localized as opposed to affecting the entire geography of the area. |
| Infrastructure | While the community hasn't experienced a catastrophic tsunami event impacting infrastructure, King Cove's infrastructure remains highly vulnerable due to many assets being concentrated near sea-level, where a significant tsunami event can severely damage or destroy critical facilities. Critical facilities at risk of tsunami impacts include the Alaska Commercial Company, Teen Center, KC Harbor Warehouse, Silver Bay Stock Room, King Cove City Red Shed, King Cove Bible Church, Cemetery, St. Herman Orthodox Church, King Cove Tribe Culture Center, USPS, Department of Public Safety Building, City Hall, Boat Lift, Port Breakwaters, Small Boat Harbor, T dock, Small Boat Harbor Crane Dock, Large Boat Harbor, Mike Uttecht Jr Harbor House, City Fuel Farm, and King Cove Gas Station. |
| People | There are no documented tsunami-related fatalities or significant injuries in King Cove. Future injuries or fatalities could occur due to drowning or being struck by strong tsunami waves. |
| Utilities | There are no documented reports of historical tsunamis causing significant damage to King Cove's utility infrastructure, including its electrical, water, wastewater, or communications systems. Future tsunamis could damage utility infrastructure, which could result in prolonged service disruptions and outages. |
| Transportation | Historically, there are no documented reports of tsunamis causing significant damage to transportation infrastructure in King Cove. A significant tsunami could inundate some roadways to and from the airport and in an extreme event potentially inundate the runway and airport infrastructure from the south. Aircraft taking off or landing on the water (floatplanes) could be impacted directly by a significant wave causing damage to aircraft and people onboard the aircraft. |
| Economy | There are no recorded economic impacts from tsunamis in King Cove. |
| Subsistence Resources | There have been no recorded instances of a tsunami in King Cove that has impacted the community's access to subsistence resources. |

#### G.4.1.10.5 Probability of Future Events

Based on DGGS inundation mapping, and the criteria identified in Table 6 of the Base Plan, it is **Likely** that King Cove will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

### G.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in King Cove is not anticipated to change in the future. |
| Location | The location of tsunami events in King Cove is not anticipated to change in the future. All low-lying coastal areas in King Cove will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in King Cove. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in King Cove. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in King Cove. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in King Cove, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in King Cove could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in King Cove, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in King Cove, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in King Cove. |

### G.4.1.11 Volcano

#### G.4.1.11.1 Location

The entire geography of King Cove is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.

According to the 2023 State of Alaska HMP, King Cove is located in a **moderate** volcanic ash hazard level area (Figure G-17).

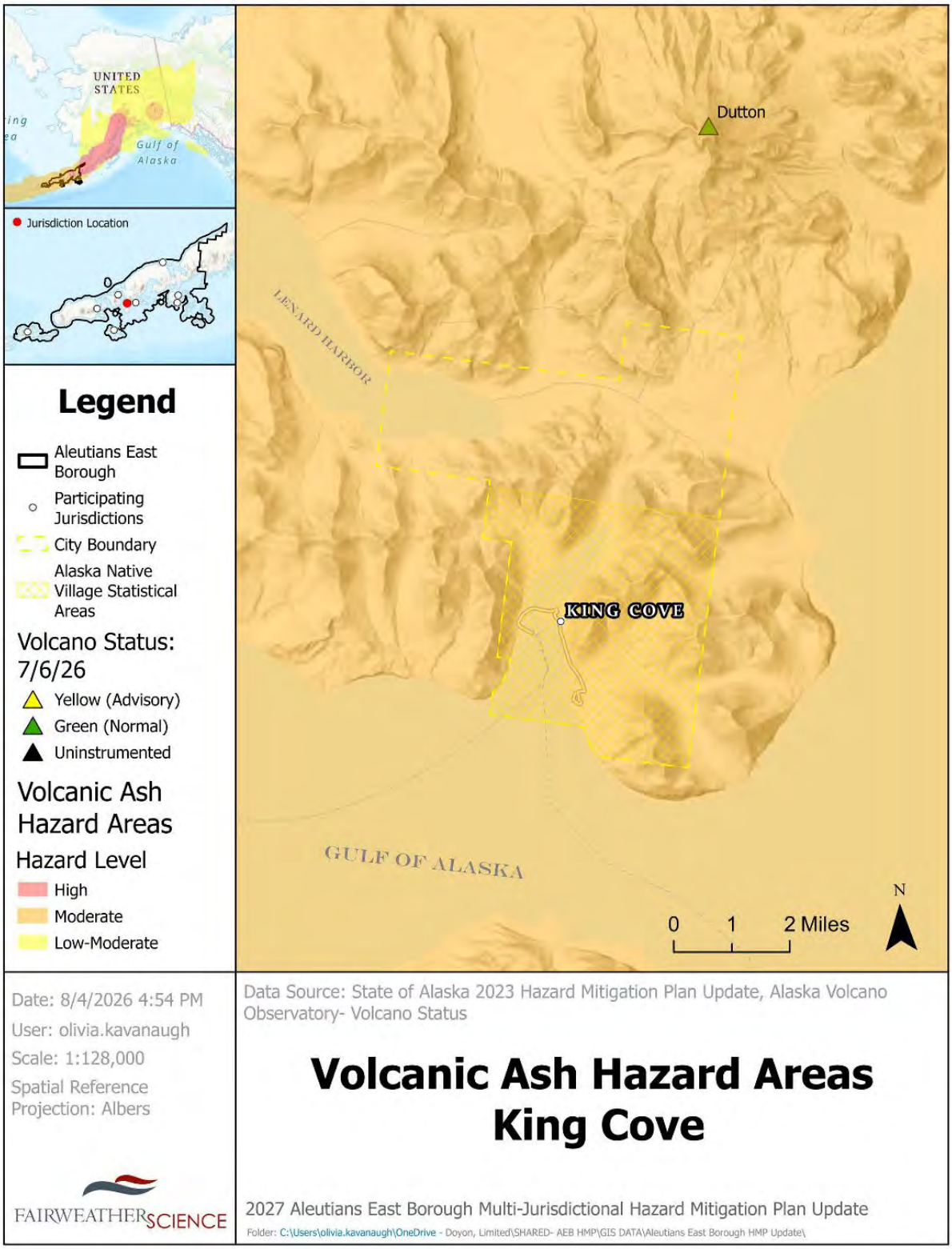



**Figure G-17- King Cove Volcanic Hazard Areas**

#### G.4.1.11.2 History

King Cove has had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to King Cove is **Mount Dutton**, which is approximately 9 miles north of the community. While no volcanic eruption has occurred at Mount Dutton, a 1988 seismic swarm near the volcano resulted in a string of earthquakes being sharply felt at King Cove (AVO 2026).

The volcano that has historically caused the most impacts at King Cove is **Mount Pavlof**. Located approximately 30 miles north of King Cove, Pavlof has erupted a total of 31 times since 1900, with several of them resulting in localized impacts. The eruptions in 1917, 1986, 1996, 2013, and 2014 resulted in light ash fall accumulating in several AEB communities, including King Cove.

**Mount Shishaldin** is a historically active volcano that has resulted in several eruptions that has impacted the AEB, including King Cove. Located approximately 70 miles west of King Cove, Shishaldin has erupted a total of 24 times since 1900. In 2023, it was reported that an eruption from Shishaldin resulted in light ash fall accumulating in King Cove.

#### G.4.1.11.3 Extent (Magnitude and Severity)

King Cove is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, King Cove has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community.

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcanoes in King Cove is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### G.4.1.11.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding King Cove has been ashfall. While most of the ash deposits incorporate into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposits (USGS 2015). |
| Infrastructure | The historical ashfall reported in King Cove has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of King Cove from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. |
| Utilities | There have been no documented cases of volcanic eruptions causing utility disruptions in King Cove. While wet ash can cause power outages by coating insulators and transformers, the ashfall in the community from past eruptions have only resulted in trace amounts scattered throughout King Cove (USGS 2015). |
| Transportation | The primary transportation related impact from a volcanic eruption in King Cove is aircraft interruptions. Ash clouds from Mount Pavlof's 2016 eruption caused flight delays and cancellations throughout Alaska, including King Cove. |
| Economy | The primary economic related impact from a volcanic eruption in King Cove is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations. |
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in King Cove that has impacted the community's access to subsistence resources. |

#### G.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact King Cove.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 7, it is **Highly Likely** King Cove will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in King Cove. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in King Cove. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in King Cove. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in King Cove. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in King Cove. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in King Cove. |
| Land Use Development | Future climate conditions are not expected to influence land use development in King Cove. |
| Subsistence Resources | Future climate conditions are not expected to influence King Cove's ability to access subsistence resources. |

### G.4.1.12 Wildland Fire

The City of King Cove Planning Team did not select this hazard to be profiled in the MJHMP Update.

According to LANDFIRE's (Landscape Fire and Resource Management Planning Tools Project) 2025 Alaska Statewide Wildfire Exposure Assessment, the majority of the King Cove Planning Area is located in an area that is **Minimally Exposed to Wildfire Hazard**. The population center of King Cove is located in an area that is Infrequently Exposed to Wildfire Hazard (Figure G-18).

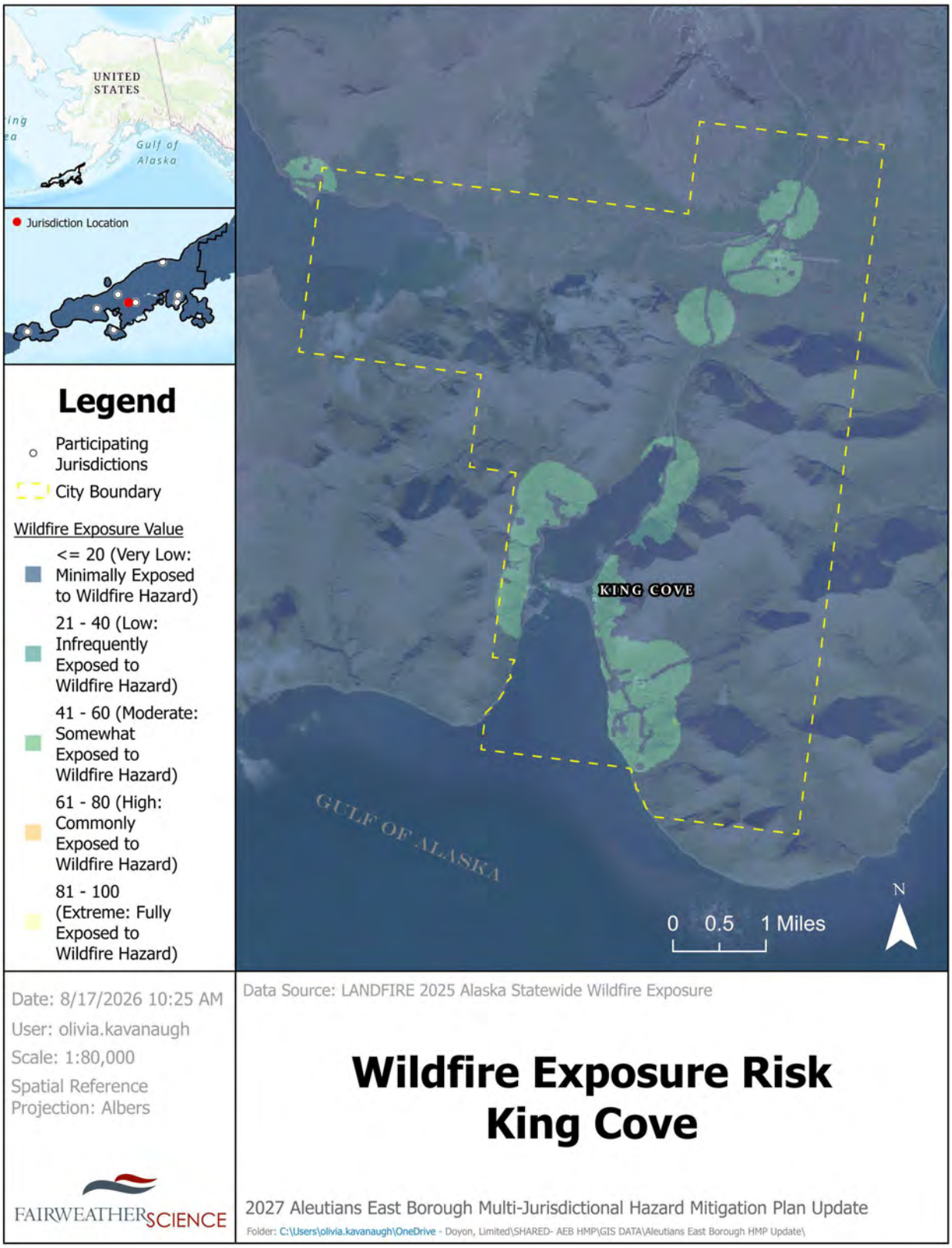



**Figure G-18- King Cove Wildfire Exposure Risk**

## G.4.2 Critical Facilities

**Table G-4- Critical Facilities- City of King Cove**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | City of King Cove | Commercial | 20 | Alaska Commercial Company | 401 Harbor Road | 55.05984 | -162.3291 | $5,000,000 | S3 | King Cove Corp | King Cove Corp | | x | x | | x | x | x | x | x | | | |
| 2 | City of King Cove | Commercial | 20 | Teen Center | 122 Ram's Crk Rd | 55.06072 | -162.3146 | $1,221,003 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 3 | City of King Cove | Commercial | 10 | KC Harbor Warehouse (Old Power House) | 407 Harbor Road | 55.06029 | -162.3284 | $1,047,636 | S3 | City | City | | | x | | x | | x | x | x | | | |
| 4 | City of King Cove | Commercial | 10 | Silver Bay Stock room | 402 Harbor Road | 55.05946 | -162.3289 | $500,000 | S3 | King Cove Corp | King Cove Corp | | x | x | | x | x | x | x | x | | | |
| 5 | City of King Cove | Commercial | 0 | King Cove City Red Shed | Park Ave | 55.06039 | -162.3140 | $409,666 | S3 | City | City | | | x | | x | | x | x | x | | | |
| 6 | City of King Cove | Community | 12 | King Cove Bible Church | 107 Ram's Creek Rd | 55.05916 | -162.3111 | $1,200,000 | W2 | Private | Private | | | x | | x | | x | x | x | | | |
| 7 | City of King Cove | Community | 3 | Cemetery | 116 Rams Creek Road | 55.06237 | -162.3117 | $5,000,000 | NA | Unknown | Unknown | | | x | | x | | x | x | x | | | |
| 8 | City of King Cove | Community | 10 | Senior Center | 243 Slocum Dr | 55.04781 | -162.2991 | $2,279,206 | W2 | City | City | | | x | | x | | x | | x | | | |
| 9 | City of King Cove | Community | 30 | The Old School (Multi-Purpose Facility) 43,202 SQFT | 121 Rams Creek Road | 55.04726 | -162.2962 | $2,080,921 | W2 | City | City | | | x | | x | | x | | x | | | |
| 10 | City of King Cove | Community | 5 | St. Herman Orthodox Church | 116 Rams Creek Road | 55.06185 | -162.3124 | $1,000,000 | W2 | Private | Private | | | x | | x | | x | x | x | | | |
| 11 | City of King Cove | Community | 12 | King Cove Tribe Culture Center | 126 Park Ave | 55.05961 | -162.3132 | $1,000,000 | W2 | Non-Profit | Non-Profit | | | x | | x | | x | x | x | | | |
| 12 | City of King Cove | Community | 30 | USPS | 137 Park Avenue | 55.05902 | -162.3133 | $1,000,000 | W2 | King Cove Corp | King Cove Corp | | | x | | x | | x | x | x | | | |
| 13 | City of King Cove | Education | 1000 | King Cove School | 236 Slocum Dr | 55.04737 | -162.2962 | $31,871,802 | S3 | AEB | AEB | | | x | | x | | x | | x | | | |
| 14 | City of King Cove | Emergency Response | 7 | Department of Public Safety 3,402 SQFT | 135 Rams Creek Rd | 55.06069 | -162.3142 | $2,683,653 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 15 | City of King Cove | Government | 6 | Public Works 7,605 SQFT | 339 Ram's Creek Rd | 55.04256 | -162.2968 | $3,623,039 | S3 | City | City | | | x | | x | | x | | x | | | |
| 16 | City of King Cove | Government | 4 | City Hall 1,670 SQFT | 110 Ram's Creek Rd | 55.05952 | -162.3112 | $1,129,471 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 17 | City of King Cove | Government | 10 | Agdaagux Tribe Tribal Office | 303 Squirrel Rd | 55.04088 | -162.3009 | $300,000 | W2 | Tribal | Tribal | | | x | | x | | x | | x | | | |
| 18 | City of King Cove | Medical | 10 | Clinic | 238 Slocum Dr | 55.04849 | -162.2957 | $20,000,000 | W2 | Tribal | Tribal | | | x | | x | | x | | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | City of King Cove | Transportation | 3 | Boat Travel Lift | Harbor Road | 55.05703 | -162.3266 | $1,300,000 | Steel | City | City | | | x | | x | | x | x | x | | | |
| 20 | City of King Cove | Transportation | 0 | Port Breakwaters | King Cove Harbor | 55.05364 | -162.3250 | $50,000,000 | 1.43 miles of stone | City | City | | | x | x | x | | x | x | x | | | |
| 21 | City of King Cove | Transportation | 20 | Small Boat Harbor | Harbor Road | 55.05521 | -162.3278 | $50,000,000 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 22 | City of King Cove | Transportation | 3 | T Dock - Small harbor boat | Harbor Road | 55.05854 | -162.3259 | $50,000,000 | Wood | City | City | | | x | | x | | x | x | x | | | |
| 23 | City of King Cove | Transportation | 3 | Small harbor crane dock | Harbor Road | 55.06009 | -162.3264 | $50,000,000 | Metal | City | City | | | x | x | x | | x | x | x | | | |
| 24 | City of King Cove | Transportation | 20 | Airport Runway | Airport Road | 55.11629 | -162.2762 | $50,000,000 | Gravel path (3,500 x 115 ft) | State | State | | | x | | | | x | | x | | | |
| 25 | City of King Cove | Transportation | 20 | Large Boat Harbor | Harbor Road | 55.05582 | -162.3231 | $13,260,524 | W2 | City | City | | | x | x | x | | x | x | x | | | |
| 26 | City of King Cove | Transportation | 0 | Harbor Bridge | Harbor Rd | 55.06092 | -162.3266 | $10,000,000 | Wood and metal | City | City | | | x | x | x | | x | | x | | | |
| 27 | City of King Cove | Transportation | 0 | Delta Creek Bridge East | AEB Route 1 | 55.12155 | -162.2747 | $10,000,000 | Wood and metal | AEB | AEB | | | x | | | | x | | x | | | |
| 28 | City of King Cove | Transportation | 0 | Waterfall Bridge | Waterfall Creek Rd | 55.12538 | -162.2730 | $10,000,000 | Wood and metal | City | City | | | x | | | | x | | x | | x | |
| 29 | City of King Cove | Transportation | 1 | King Cove DOT | 608 Airport Rd | 55.11446 | -162.2744 | $5,000,000 | S3 | State | State | | | x | | | | x | | x | | | |
| 30 | City of King Cove | Transportation | 3 | Mike Uttecht Jr Harbor House 3,600 SQFT | 407 Harbor Road | 55.05677 | -162.3260 | $1,016,303 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 31 | City of King Cove | Utilities | 3 | City Fuel Farm | Harbor Road | 55.06035 | -162.3289 | $10,000,000 | Steel tanks | City | City | | | x | | x | | x | x | x | | | |
| 32 | City of King Cove | Utilities | 2 | Welcome to King Cove Water Tower | Airport Rd | 55.10545 | -162.2903 | $10,000,000 | Steel Tank | City | City | | | x | | | | x | | x | | | |
| 33 | City of King Cove | Utilities | 3 | Powerhouse | 237 Slocum Dr | 55.04813 | -162.2936 | $8,032,348 | S3 | City | City | | | x | | x | | x | | x | | | |
| 34 | City of King Cove | Utilities | 4 | Clear Creek Dam | Delta Creek Rd | 55.13972 | -162.2699 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 35 | City of King Cove | Utilities | 4 | Delta Creek Dam | End of Delta Creek Rd | 55.14010 | -162.2725 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 36 | City of King Cove | Utilities | 3 | Waterfall Creek Dam | Waterfall Drive | 55.11441 | -162.2801 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 37 | City of King Cove | Utilities | 3 | Old Ram's Creek Dam/Water Reservoir | Slocum Dr | 55.05707 | -162.2771 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 38 | City of King Cove | Utilities | 2 | Chlorine House | 205 Hillside Dr | 55.04908 | -162.3042 | $5,000,000 | Concrete | City | City | | | x | | x | | x | | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | City of King Cove | Utilities | 1 | Water Reservoir | Unknown | 55.05707 | -162.2771 | $5,000,000 | Metal Dam | City | City | | | x | | | | x | | x | | | |
| 40 | City of King Cove | Utilities | 3 | Land Field | Salmon Berry Dr | 55.03477 | -162.2935 | $5,000,000 | Gravel | City | City | | | x | | x | | x | | x | | | |
| 41 | City of King Cove | Utilities | 1 | AT&T / Fastwyre | Hillside Dr | 55.04939 | -162.3042 | $5,000,000 | Cell Tower | Private | Private | | | x | | x | | x | | x | | | |
| 42 | City of King Cove | Utilities | 1 | GCI Satellite Station | Rams Creek Road | 55.06082 | -162.3144 | $5,000,000 | Cell Tower | Private | Private | | | x | | x | | x | x | x | | | |
| 43 | City of King Cove | Utilities | 2 | Water Treatment Plant 1,914 SQFT | 605 Delta Crk Rd | 55.12342 | -162.2721 | $1,757,290 | S3 | City | City | | | x | | | | x | | x | | | |
| 44 | City of King Cove | Utilities | 12 | King Cove Gas Sation | Harbor Road | 55.05647 | -162.3269 | $506,060 | Steel Tank | City | City | | | x | | x | | x | x | x | | | |
| 45 | City of King Cove | Utilities | 3 | Hydro Intake House/Clear Creek | Clear Creek | 55.13973 | -162.2699 | $155,708 | S3 | City | City | | | x | | | | x | | x | | x | |
| 46 | City of King Cove | Utilities | 3 | Hydro Intake House/Glacier Creek | Glacier Creek | 55.14001 | -162.2721 | $155,708 | S3 | City | City | | | x | | | | x | | x | | x | |
| **Total Occupants:** | | | **1322** | **Total Estimated Value:** | | | | **$457,530,338** | | | | | | | | | | | | | | | |

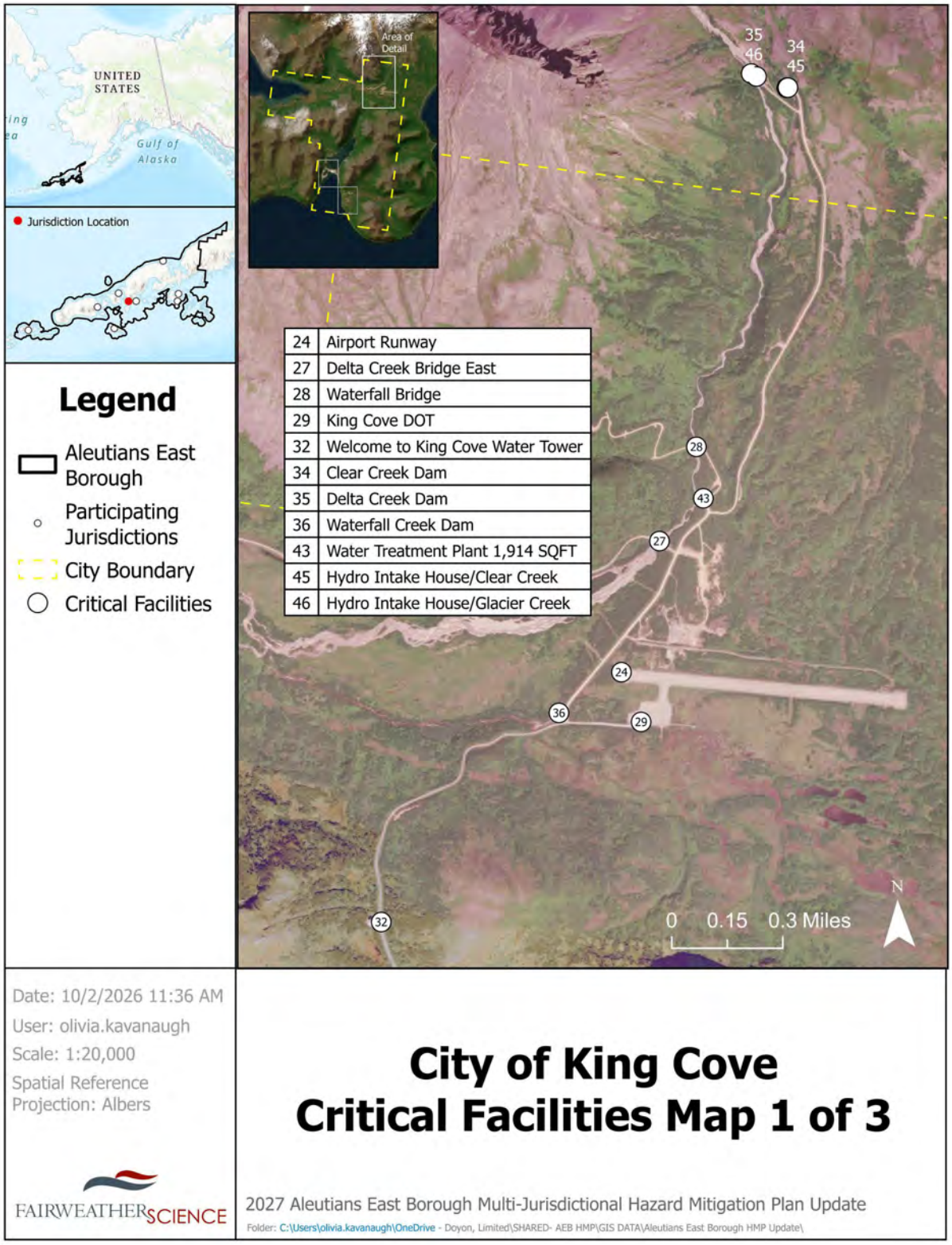



**Figure G-19- City of King Cove Critical Facilities Map 1 of 3**

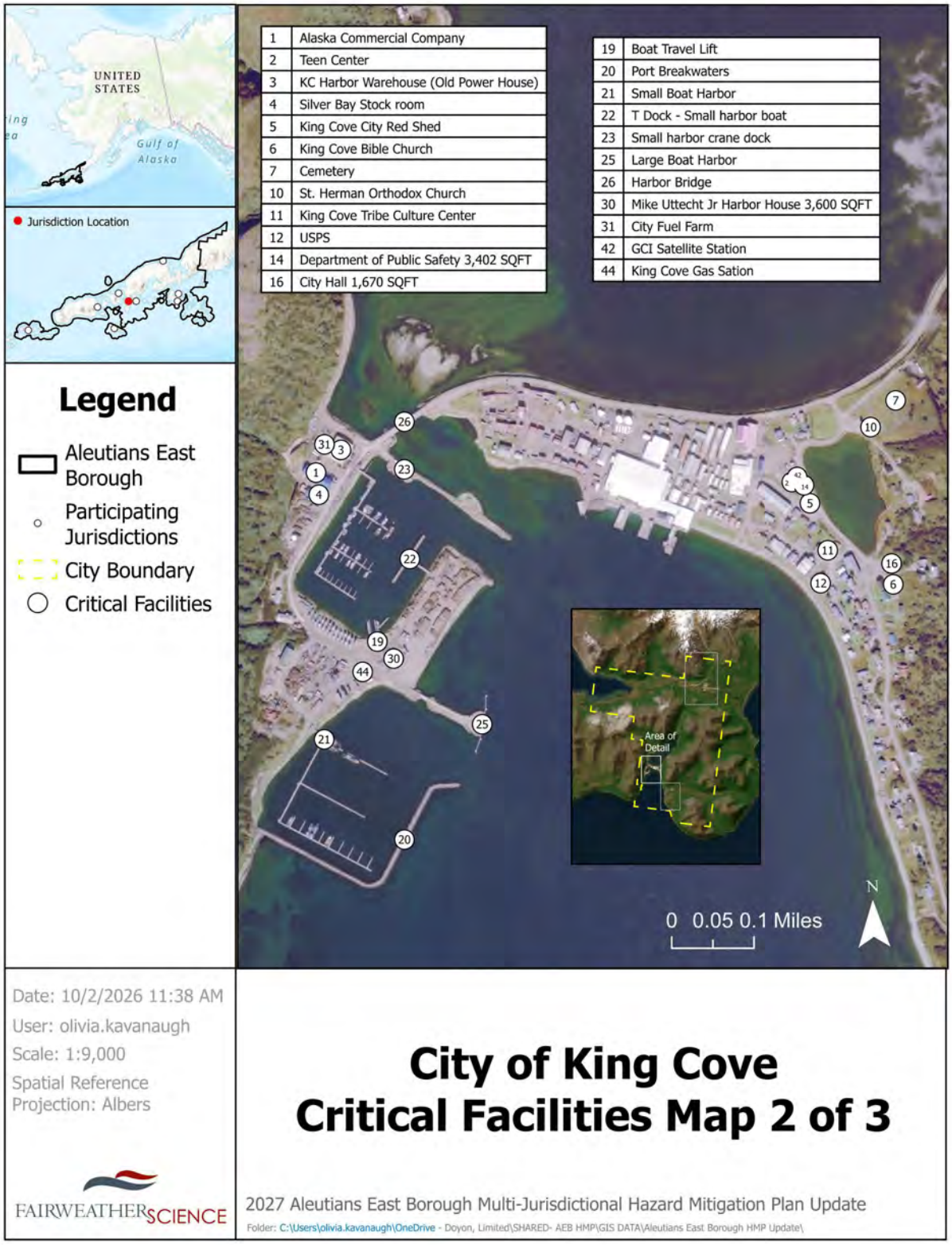



**Figure G-20- City of King Cove Critical Facilities Map 2 of 3**

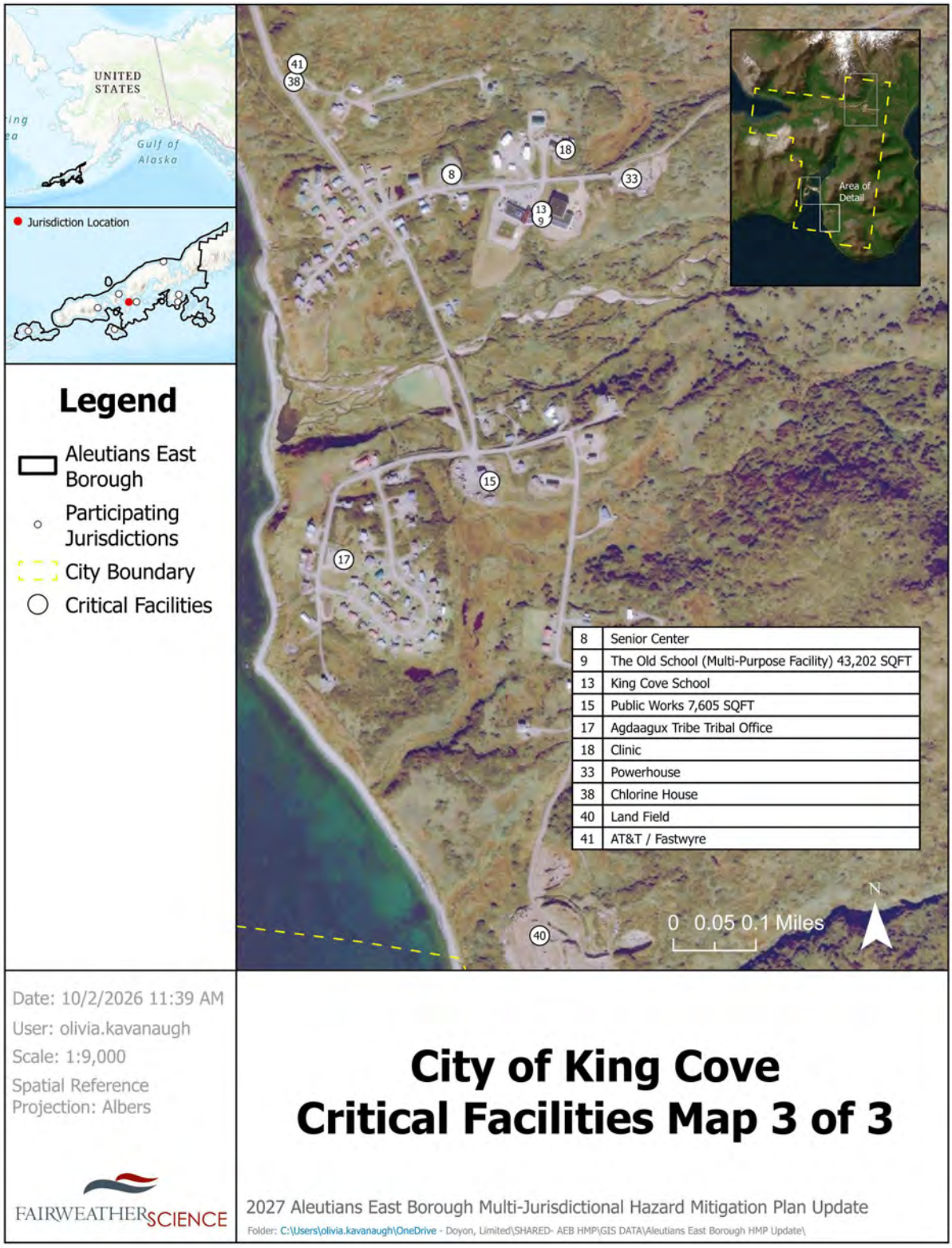



**Figure G-21- City of King Cove Critical Facilities Map 3 of 3**

## G.4.3 Summary of Vulnerability

**Table G-5- Jurisdictional Summary of Vulnerability- City of King Cove**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere-Snow Avalanche | 2 | 30 | $5,500,000 | 8 | 32 | $5,799,104 |
| Earthquake | 46 | 1322 | $457,530,338 | 178 | 736 | $129,345,657 |
| Sediment Deterioration and Land Destabilization | 4 | 23 | $123,260,524 | 8 | 32 | $5,799,104 |
| Flood | 33 | 1276 | $345,461,632 | 178 | 736 | $129,345,657 |
| Ground Failure/ Landslide | 2 | 30 | $5,500,000 | 8 | 32 | $5,799,104 |
| Severe Weather | 46 | 1322 | $457,530,338 | 178 | 736 | $129,345,657 |
| Tsunami | 22 | 201 | $252,274,316 | 70 | 280 | $50,659,632 |
| Volcano | 46 | 1322 | $457,530,338 | 178 | 736 | $129,345,657 |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | 7 | 20 | $30,311,416 | 0 | 0 | $0 |
| Invasive Species | 0 | 0 | $0 | 0 | 0 | $0 |

## G.5 Capability Assessment

***Note: the City of King Cove does not participate in the National Flood Insurance Program (NFIP).***

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| **Plans** | | |
| Capital Improvements Plan | Yes | 2026 |
| Climate Change Adaptation Plan | No | |
| Community Wildfire Protection Plan | No | |
| Comprehensive/Master Plan | Yes | Dated 1968, 1981, 2006 |
| Continuity of Operations Plan | Unsure | |
| Economic Development Plan | Yes | 2026 |
| Land Use Plan | Yes | 1990 |
| Local Emergency Operations Plan | Yes | 2025 |
| Stormwater Management Plan | Unsure | |
| Transportation Plan | Unsure | |
| Other- Waterfront Utilities Plan | Yes | Dated 2003 |
| **Land Use Planning and Ordinances** | | |
| Acquisition of land for open space and public recreation use | Yes | 1990 |
| Building code | Yes | 1990 |
| Flood insurance rate maps | No | |
| Floodplain ordinance | No | |
| Substantial Damage Plan | Unsure | |
| Natural hazard specific ordinance (stormwater, steep slope, wildfire) | Unsure | |
| Subdivision ordinance | Yes | 1990 |
| Zoning ordinance | Yes | 1990 |
| **Administrative** | | |
| Chief Building Official | Unsure | |
| Civil Engineer | Unsure | |
| Community Planner | Yes | Chris Babcock |
| Emergency Manager | Yes | Chris Babcock |
| Floodplain Administrator | No | |
| GIS Coordinator | Unsure | |
| Planning Commission | No | |

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| **Technical** | | |
| Grant writing | Yes | |
| Hazard data and information | No | |
| GIS analysis | No | |
| Mutual aid agreements | Unsure | |
| **Funding Resources** | | |
| Capital improvements project funding | Yes | 2026 |
| Community Development Block Grant | Yes | 2026 |
| Federal funding programs (non-FEMA) | Yes | 2026 |
| Fees for water, sewer, gas, or electric services | Yes | |
| Impact fees for new development | Yes | |
| State funding programs | Yes | |
| Stormwater utility fee | No | |
| **Community Programs/Organizations** | | |
| Community newsletters | Yes | Monthly |
| Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events) | Yes | Annually |
| Local news | No | |
| Organizations that represent/advocate for/interact with underserved and vulnerable communities/populations | Unsure | |
| Social media | Yes | |

Subsistence sharing may also function as a community resilience capability. A regional subsistence study documented an intercommunity sharing relationship in which residents of False Pass received clams shared from King Cove when local clam availability was reduced. This example demonstrates how resource-sharing relationships can help maintain access to subsistence foods when a resource is less available in another community.

# G.6 Mitigation Strategy

## G.6.1 Mitigation Goals

The City of King Cove has identified its goals related to hazard mitigation as:

1. Reduce potential earthquake vulnerability, damage, and loss.
2. Reduce potential tsunami vulnerability, damage, and loss.
3. Reduce potential volcano vulnerability, damage, and loss.
4. Reduce potential severe weather vulnerability, damage, and loss.
5. Reduce potential flooding and erosion vulnerability, damage, and loss.
6. Reduce potential changes in the cryosphere vulnerability, damage, and loss.

## G.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

The City of King Cove reviewed mitigation actions identified in the 2021 AEB HMP and provided a status update for each action.

- ***Completed***- this action has been completed
- ***In Progress/Ongoing***- this action has been started is currently in-progress or ongoing
- ***Not Started***- this action has not been started

| Number | Action | Status |
|---|---|---|
| **1** | Identify buildings and facilities that must be able to remain operable during and following an earthquake event. | Completed |
| **2** | Consider participation in the Tsunami Awareness Program | Completed |
| **3** | Install an additional tsunami siren by the City Shop. | In progress/Ongoing |
| **4** | Conduct special awareness activities, such as Winter Weather Awareness Week. | In progress/Ongoing |
| **5** | Update, as needed, emergency notification procedures and emergency planning for ash fall events. | Completed |
| **6** | Evaluate water treatment plant to ensure that ashfall can't enter the system. | Completed |
| **7** | The City has several small erosion/flooding projects planned for the spring. | In progress/Ongoing |
| **8** | Install warning signage in known avalanche zones. | In progress/Ongoing |
| **9** | Map avalanche hazard zones. | In progress/Ongoing |
| **10** | Conduct a time-lapsed photographic study of the glaciers on Mt. Dutton that power the hydroelectric facilities to ensure there will be enough water to power the facilities well into the future. | In progress/Ongoing |

## G.6.3 2027 Mitigation Action Plan

**Table G-6- 2027 Mitigation Action Plan- City of King Cove**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | Avalanche | Install warning signage in known avalanche zones. | H | City Administrator | FEMA HMA; FEMA HMGP; Alaska DHS&EM; Alaska DOT&PF; Denali Commission | Structure and Infrastructure Projects | All | 0-2 years | B/C: This project would provide clear warnings in known avalanche areas and help reduce public exposure to avalanche hazards.<br>TF: This project is technically feasible using standard warning signage and appropriate placement in identified avalanche hazard areas. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Capital Improvement Plan |
| **2** | Avalanche | Support mapping of avalanche hazard zones to educate and inform the public that may have residences on those zones. | H | City Administrator | FEMA HMA; FEMA HMGP; USGS; Alaska DGGS; Alaska DHS&EM; Denali Commission | Plans and Regulations | All | 0-2 years | B/C: This project would improve public understanding of avalanche hazards and help inform future planning and mitigation actions.<br>TF: This project is technically feasible using available mapping methods and technical assistance from State agencies. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Land Use Plan |
| **3** | Dam Failure | Map potential inundation areas of Clear Creek Dam and Delta Creek Dam to better understand where to focus future dam failure mitigation actions | L | City Administrator | FEMA HHPD; FEMA HMA; FEMA HMGP; USACE Planning Assistance to States; Alaska DNR Dam Safety Program; Alaska DHS&EM | Plans and Regulations | Clear Creek Dam, Delta Creek Dam, Other | 0-2 years | B/C: This project would identify areas potentially affected by dam failure and help focus future mitigation efforts on vulnerable people, infrastructure, and facilities.<br>TF: This project is technically feasible using available mapping data and technical assistance from State and Federal agencies. | Existing Plans: Comprehensive Plan; Community Plan; Comprehensive Development Plan.<br>Future Plans: SCERP/EOP; Dam Safety Plan; Emergency Response Plan; Capital Improvement Plan |
| **4** | Earthquake | Bring the DHS&EM "Quake Cottage" to King Cove for earthquake simulation and education | M | City Administrator | FEMA EMPG; FEMA HMA; Alaska DHS&EM; Alaska Earthquake Center/UAF | Education and Awareness Programs | All | 0-2 years | B/C: This project would provide hands-on earthquake education and help residents better understand appropriate protective actions during an earthquake.<br>TF: This project is technically feasible through coordination with DHS&EM and established earthquake education resources. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **5** | Earthquake | Establish earthquake event exercises for school | H | City Administrator | FEMA EMPG; FEMA HMA; Alaska DHS&EM; Alaska Department of Education & Early Development; School District | Education and Awareness Programs | School | 0-2 years | B/C: This project would improve earthquake preparedness among students and staff by providing an opportunity to practice appropriate response actions.<br>TF: This project is technically feasible using school facilities, emergency exercise procedures, and emergency management guidance. | Existing Plans: Comprehensive Plan; Community Plan. Future Plans: SCERP/EOP; Emergency Preparedness Plan; School Facilities Plan; Continuity of Operations Plan; Capital Improvement Plan |
| **6** | Earthquake | Educate community on when to secure heavy objects (reference FEMA and State material) and provide materials to secure objects | M | City Administrator | FEMA HMA; FEMA EMPG; FEMA HMGP; Alaska DHS&EM; Alaska Earthquake Center/UAF | Education and Awareness Programs | All | 0-2 years | B/C: This project would reduce the potential for injuries and property damage by encouraging residents to secure heavy objects before an earthquake. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | TF: This project is technically feasible using FEMA and State guidance and readily available securing materials. | |
| **7** | Flood | Conduct coastal flood assessment to identify flood-prone areas and vulnerable facilities | L | City Administrator | FEMA HMA; FEMA FMA; FEMA HMGP; USACE Planning Assistance to States; NOAA; Alaska DGGS; Alaska DHS&EM; Alaska DEC; Denali Commission | Plans and Regulations | Critical Facilities | 3-4 years | B/C: This project would identify areas and facilities vulnerable to coastal flooding and help prioritize future mitigation actions.<br>TF: This project is technically feasible using established mapping, field assessment, and technical analysis methods. | Existing Plans: Comprehensive Plan; Community Plan; Comprehensive Development Plan. Future Plans: Land Use Plan; Environmental Plan; Capital Improvement Plan; SCERP/EOP |
| **8** | Flood | Coordinate with Borough and State to improve roadside drainage to flood-prone roadways such as W Lagoon Rd and other roads that are susceptible to coastal flooding | H | City Administrator | FEMA HMA; FEMA HMGP; FEMA FMA; FHWA PROTECT/Alaska DOT&PF Resiliency & Coastal Protection Program; Alaska DOT&PF; USACE; Alaska DEC; Denali Commission | Structure and Infrastructure Projects | Roads | 5-10 years | B/C: Improving roadside drainage would reduce localized flooding and help maintain access along roads vulnerable to coastal flooding.<br>TF: This project is technically feasible using established engineering practices but may require coordination with Borough and State agencies. | Existing Plans: Comprehensive Plan; Community Plan; Comprehensive Development Plan.<br>Future Plans: Transportation Plan; Stormwater/Drainage Plan; Capital Improvement Plan; SCERP/EOP |
| **9** | Flood | Establish a community flood water monitoring program to collect high water marks and other flood metrics | L | City Administrator | FEMA HMA; FEMA HMGP; NOAA; USGS; Alaska DGGS; USACE; Alaska DEC; Alaska DHS&EM | Plans and Regulations | All | 3-4 years | B/C: This project would improve understanding of local flood conditions by documenting high water marks and other flood measurements to support future planning and mitigation.<br>TF: This project is technically feasible using established monitoring methods and community participation. | Existing Plans: Comprehensive Plan; Community Plan; Waterfront Utilities Plan. Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Works/Capital Improvement Plan |
| **10** | Ground Failure/Landslide | Look into planting trees and vegetation to stabilize land from landslide and erosion | M | City Administrator | FEMA HMA; FEMA HMGP; USDA NRCS; USACE; NOAA; Alaska DEC; Alaska DGGS; Denali Commission | Other | All | 0-2 years | B/C: Planting trees and vegetation could help stabilize vulnerable slopes and reduce potential erosion and landslide impacts.<br>TF: This project is technically feasible in suitable areas but may require site-specific evaluation, appropriate vegetation, and ongoing maintenance. | Existing Plans: Comprehensive Plan; Community Plan; Comprehensive Development Plan.<br>Future Plans: Land Use Plan; Environmental Plan; Natural Resources Plan; Capital Improvement Plan; SCERP/EOP |
| **11** | Ground Failure/Landslide | Have DGGS conduct landslide hazard analysis and determine if monitoring equipment is necessary or additional mitigation projects to protect specific infrastructure is needed | L | City Administrator | USGS Landslide Hazards Program; FEMA HMA; FEMA HMGP; Alaska DGGS; Alaska DHS&EM; USACE Planning Assistance to States; Denali Commission | Plans and Regulations | All | 3-4 years | B/C: This project would identify landslide hazards and help determine where monitoring or additional mitigation measures could reduce risks to people and critical infrastructure.<br>TF: This project is technically feasible through technical assistance from DGGS and established landslide assessment methods. | Existing Plans: Comprehensive Plan; Community Plan; Comprehensive Development Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Capital Improvement Plan; Facilities Management Plan |
| **12** | Invasive Species | Invest in invasive species education throughout the community (City website, | L | City Administrator | USDA; USFWS; NOAA; Alaska DEC; Alaska Department of Fish & | Education and Awareness Programs | N/A | 0-2 years | B/C: This project would increase public awareness of invasive species and encourage actions that can | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: Environmental Plan; |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | public info signs at popular outdoor recreation sites/trailheads). | | | Game; Alaska Invasive Species Partnership | | | | reduce their spread and impacts on the local environment.<br>TF: This project is technically feasible through public outreach, educational materials, signage, and community events. | Natural Resources Plan; Public Information/Outreach Plan |
| **13** | Invasive Species | Continue annual SlugOut event to reduce number of slugs in King Cove | H | City Administrator | USDA; USFWS; Alaska DEC; Alaska Department of Fish & Game; Local/private sponsorships | Education and Awareness Programs | N/A | 0-2 years | B/C: Continuing the annual SlugOut event would support community efforts to reduce slug populations and increase public awareness of invasive species.<br>TF: This project is technically feasible by continuing the established community event and associated outreach activities. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: Environmental Plan; Natural Resources Plan; Public Information/Outreach Plan |
| **14** | Sediment Deterioration and Land Destabilization | Conduct a community wide coastal land destabilization assessment | M | City Administrator | FEMA HMA; FEMA HMGP; NOAA; USGS; Alaska DGGS; USACE Planning Assistance to States; Alaska DHS&EM; Denali Commission | Plans and Regulations | All | 3-4 years | B/C: This project would identify areas of coastal land destabilization and help prioritize locations for monitoring and future mitigation efforts.<br>TF: This project is technically feasible using field assessments, mapping, and available technical expertise. | Existing Plans: Comprehensive Plan; Community Plan; Comprehensive Development Plan.<br>Future Plans: Land Use Plan; Environmental Plan; Natural Resources Plan; Capital Improvement Plan |
| **15** | Sediment Deterioration and Land Destabilization | Support establishment of permanent monitoring station at W Lagoon shoreline. | H | City Administrator | NOAA; USGS; FEMA HMA; FEMA HMGP; Alaska DGGS; Alaska DHS&EM; USACE; Denali Commission | Structure and Infrastructure Projects | Coastal Infrastructure | 0-2 years | B/C: A permanent shoreline monitoring station would provide ongoing information on coastal changes and help identify emerging hazards that may affect the community.<br>TF: This project is technically feasible using established monitoring technology but may require outside technical support, installation, and ongoing maintenance. | Existing Plans: Comprehensive Plan; Community Plan; Comprehensive Development Plan.<br>Future Plans: Land Use Plan; Environmental Plan; Capital Improvement Plan; Transportation Plan |
| **16** | Land Destabilization | Supporting the set-up of video and time-lapse destabilization monitoring of King Cove side of new road. | H | City Administrator | FEMA HMA; FEMA HMGP; USGS; Alaska DGGS; Alaska DOT&PF; NOAA; Denali Commission | Plans and Regulations | All | 0-2 years | B/C: Video and time-lapse monitoring would improve understanding of land destabilization along the new road and help identify changes that may threaten transportation infrastructure.<br>TF: This project is technically feasible using commercially available monitoring equipment, with routine maintenance and data review required. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: Transportation Plan; Capital Improvement Plan; SCERP/EOP |
| **17** | Severe weather | Conduct special awareness and education activities, such as Winter Weather Awareness Week, especially extreme cold (what to do, heat tape) | H | City Administrator | FEMA EMPG; FEMA HMA; Alaska DHS&EM; Denali Commission | Education and Awareness Programs | All | 0-2 years | B/C: This project would improve community preparedness for extreme winter weather and help residents reduce potential health, property, and utility impacts.<br>TF: This project is technically feasible through community outreach, public education materials, and State and Federal guidance. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Continuity of Operations Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **18** | Severe Weather/Multi-hazard | Install generators with routine maintenance at critical facilities for extended utility disconnect during catastrophic event | H | City Administrator | FEMA HMA; FEMA HMGP; FEMA EMPG; USDA Rural Development; Denali Commission; Alaska DHS&EM; Alaska Native Tribal Health Consortium | Structure and Infrastructure Projects | Generators | 0-2 years | B/C: This project would provide backup power to critical facilities, helping maintain essential services during extended utility outages following a catastrophic event.<br>TF: This project is technically feasible using commercially available generators, with appropriate installation and routine maintenance. | Existing Plans: Comprehensive Plan; Community Plan; Waterfront Utilities Plan. Future Plans: SCERP/EOP; Continuity of Operations Plan; Facilities Management Plan; Capital Improvement Plan |
| **19** | Tsunami | Install an additional tsunami siren by the City Shop. | L | City Administrator | FEMA HMA; FEMA HMGP; NOAA/National Tsunami Hazard Mitigation Program; Alaska DHS&EM; Alaska DGGS; Denali Commission | Structure and Infrastructure Projects | All | 3-4 years | B/C: This project would provide an additional warning system to alert residents of a potential tsunami and support timely evacuation.<br>TF: This project is technically feasible using standard warning system equipment and appropriate installation and maintenance. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: SCERP/EOP; Tsunami/Emergency Evacuation Plan; Emergency Preparedness Plan; Public Information/Outreach Plan; Capital Improvement Plan |
| **20** | Tsunami | Conduct tsunami vulnerability assessment on facilities located in the inundation zone | H | City Administrator | FEMA HMA; FEMA HMGP; NOAA/National Tsunami Hazard Mitigation Program; Alaska DGGS; Alaska DHS&EM; USACE; Denali Commission | Plans and Regulations | Critical Facilities in Inundation Zone | 0-2 years | B/C: This project would identify facilities vulnerable to tsunami inundation and help prioritize future mitigation measures to reduce potential damage and service disruptions.<br>TF: This project is technically feasible using existing tsunami inundation maps, facility information, and technical assistance. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: SCERP/EOP; Tsunami/Emergency Evacuation Plan; Emergency Preparedness Plan; Capital Improvement Plan |
| **21** | Tsunami | Evaluate tsunami exposure of critical utility and communications infrastructure and implement feasible measures to protect vulnerable equipment and maintain essential services following a tsunami. | H | City Administrator | FEMA HMA; FEMA HMGP; NOAA/National Tsunami Hazard Mitigation Program; USACE; USDA Rural Development; Denali Commission; Alaska DHS&EM; Alaska DOT&PF | Other | All | 0-2 years | B/C: This project would identify vulnerable utility and communications infrastructure and help maintain essential services following a tsunami.<br>TF: This project is technically feasible using infrastructure assessments and commercially available protective measures. | Existing Plans: Comprehensive Plan; Waterfront Utilities Plan; Community Plan.<br>Future Plans: Water System/Utility Plan; SCERP/EOP; Continuity of Operations Plan; Capital Improvement Plan; Emergency Preparedness Plan |
| **22** | Tsunami | Public education outreach materials for tsunami evacuation routes and inundation mapping. | H | City Administrator | FEMA EMPG; FEMA HMA; FEMA HMGP; NOAA/National Tsunami Hazard Mitigation Program; Alaska DHS&EM; Alaska DGGS; Denali Commission | Education and Awareness Programs | All | 0-2 years | B/C: This project would improve public understanding of tsunami evacuation routes and inundation areas, supporting timely and informed evacuation during a tsunami.<br>TF: This project is technically feasible using established evacuation maps, public outreach methods, and community education. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: SCERP/EOP; Tsunami/Emergency Evacuation Plan; Public Information/Outreach Plan |
| **23** | Volcano | Develop an ashfall response and cleanup plan | L | City Administrator | FEMA EMPG; FEMA HMA; FEMA HMGP; USGS/Alaska Volcano Observatory; Alaska DHS&EM; Alaska DEC; Alaska DGGS; Alaska | Plans and Regulations | All | 3-4 years | B/C: This project would establish procedures for responding to and cleaning up ashfall, helping reduce impacts to public health, transportation, facilities, and essential services. | Existing Plans: Comprehensive Plan; Community Plan; Comprehensive Development Plan.<br>Future Plans: SCERP/EOP; Emergency Response Plan; Emergency Preparedness Plan; Public Information/Outreach Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Native Tribal Health Consortium | | | | TF: This project is technically feasible using established emergency planning practices and State and Federal guidance. | |
| **24** | Volcano | Education to public about what to do during ashfall (vehicles, health, pets) | L | City Administrator | FEMA EMPG; FEMA HMA; Alaska DHS&EM; USGS/Alaska Volcano Observatory; Alaska DEC; Alaska Department of Health; Alaska Native Tribal Health Consortium | Education and Awareness Programs | All | 0-2 years | B/C: Public education on ashfall preparedness would help residents protect their health, vehicles, pets, and property during an ashfall event.<br>TF: This project is technically feasible using established public outreach methods and State and Federal guidance. | Existing Plans: Comprehensive Plan; Community Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan |

### G.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| The City has several small erosion/flooding projects planned for the spring. | These are already in progress and will be resolved. |
| Conduct time - lapsed photographic study on mount Dutton's glaciers. | Not a current priority. |
| Provide dam safety information through various mediums (website, social media) | Not a current priority. |
| Obtain funding to create airplane mitigation "kit" to protect planes and airport operations during ashfall (plastic covering for engines, equipment to remove ash on planes, etc.) | Not a current priority. |
| Conduct an inventory of high occupancy buildings and critical facilities that need seismic retrofitting | Not a current priority. |
| Prohibit removal of vegetation in landslide areas | Not a current priority. |
| Install warning signs in landslide prone areas | Not a current priority. |
| Retrofit critical facilities to withstand high wind events (Wind shutters) | Not a current priority. |
| Incorporate severe weather warnings into Nixie or other community notification systems | Not a current priority. |
| In coordination with USFWS, conduct a community-wide invasive plant survey event, and ensure that the results get uploaded on AKEPIC database. Possibly do this during Slugout event. | Not a current priority. |
| Provide an annual community workshop on how to mitigate impacts of invasive slugs on local gardens | Not a current priority. |
| Develop and implement volcanic ashfall contingency procedures for the King Cove Airport to reduce disruption to aviation operations and support safe inspection, cleanup, closure, and reopening following ashfall events. | Not a current priority. |

# G.7 Plan Update

## G.7.1 Changes in Development, including in Hazard-Prone Areas (current and future)

### G.7.1.1 Changes in Development Since 2021

There has been little development in King Cove between 2021 and 2026, and the City's overall vulnerability to natural hazards has not significantly changed. In January 2024, Peter Pan closed their seafood processing plant in King Cove, which was the company's largest processing plant.

### G.7.1.2 Future/Planned Development

Future development in King Cove includes construction of the King Cove to Cold Bay Road, a major transportation project that will provide a roadway connection to the Cold Bay Airport and improve access to regional services and emergency transportation.

This planned development is not anticipated to substantially increase or decrease the City's overall vulnerability to natural hazards; however, erosion is a potential concern associated with development and road construction. Disturbance of soils and vegetation, changes in drainage patterns, and increased runoff could contribute to localized erosion, particularly in areas susceptible to coastal, riverine, or stormwater-related erosion.

## G.7.2 Changes in Priorities and Mitigation Efforts

The City's priorities and mitigation efforts in the previous HMP mainly focused on severe weather, tsunami, volcano, and avalanche.

The City's priorities and goals in this HMP shift towards brick-and-mortar mitigation projects. The highest priority for the City is to maintain services during and after hazard events (backup generators for critical facilities), improvements to flood prone areas, and protection of critical facilities.

# G.8 Plan Maintenance

## G.8.1 Planning Team MJHMP Maintenance Commitment

The City of King Cove is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.6.

The City of King Cove is committed to annually reviewing the Plan and City staff will work to complete their review responsibilities.

## G.8.2 Continued Public Involvement

The City of King Cove is dedicated to continued public involvement over the next five years.

The City of King Cove will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2031.

## G.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The City of King Cove jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The City Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### G.8.3.1.1 Implementing

Upon adoption of the Plan, the City of King Cove will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The City will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### G.8.3.1.2 Monitoring

The City of King Cove will monitor the progress of mitigation actions on an annual basis. The City Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### G.8.3.1.3 Evaluating

The City of King Cove will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

#### G.8.3.1.4 Updating

The City of King Cove will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.6(c)(4)(i). The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Figure G-22 provides a visual of the HMP plan maintenance activities per year.

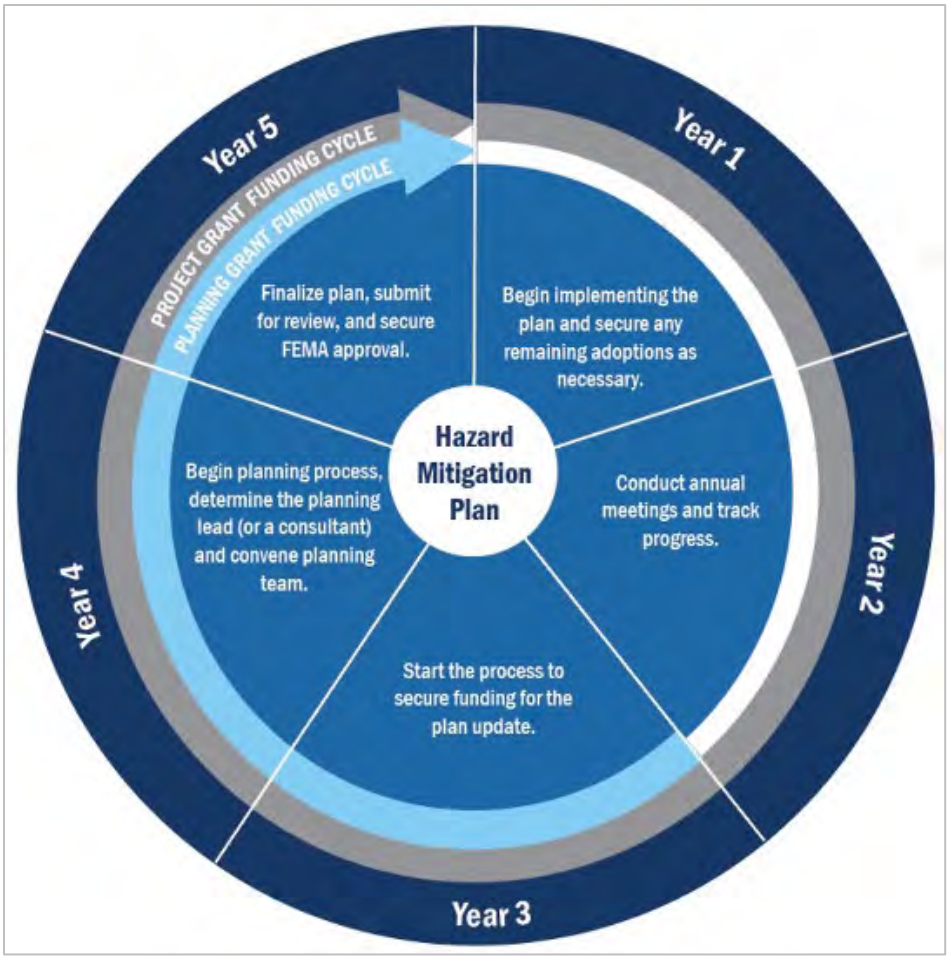



**Figure G-22- HMP Update Schedule**

## G.8.4 Plan Integration

The City of King Cove will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other planning and implementation processes, when appropriate.

The City will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the City's comprehensive and land use planning processes, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects.

As the plan is implemented, the City of King Cove will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## G.9 Plan Adoption

The City of King Cove formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

[insert signed adoption resolution]

# H. Agdaagux Tribe of King Cove



Photo Credit: Aleutians East Borough

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# H.1 Planning Team and Tribal Definition of Public

## H.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Etta Kuzakin** | President |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

## H.1.2 Tribal Definition of Public

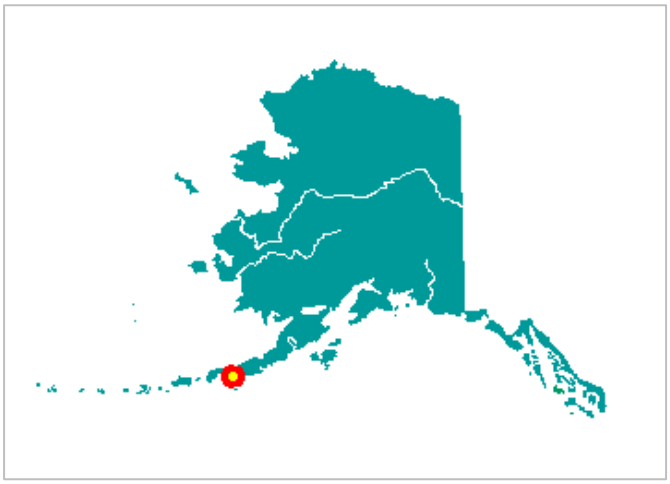
For purposes of public involvement in the HMP Update planning process, the Agdaagux Tribe of King Cove defines the “public” as anyone living or working in King Cove, including individuals who are not enrolled members of the Agdaagux Tribe of King Cove. The public also includes Tribal members enrolled in the Agdaagux Tribe of King Cove who do not currently reside in King Cove.

This definition ensures that anyone who lives or works within the community, as well as enrolled Tribal Members residing outside the community, is eligible to attend and participate in the public involvement portion of the HMP Update planning process.

# H.2 Community Profile

## H.2.1 Location and Geography

The Agdaagux Tribe is located in the City of King Cove, which is located on the south side of the Alaska Peninsula, on a sand spit fronting Deer Passage and Deer Island. The community is located 18 miles southeast of Cold Bay and 625 miles southwest of Anchorage. Located in the maritime climate zone, temperatures average 25° to 55°F, with extremes from -9° to 76°F. Snowfall averages 52 inches annually, and total annual precipitation is 33 inches. Access to King Cove can be limited in the summer during fog and in the winter during high wind events.



For hazard mitigation planning purposes, the Agdaagux Tribe's community context includes both the developed community of King Cove and the relationships Tribal members maintain with surrounding lands, waters, subsistence resources, and access areas. These connections are important when considering vulnerability because hazard impacts may affect not only buildings and infrastructure but also access to resources and places used for subsistence and cultural purposes.

## H.2.2 History

The Unangax̂ people have lived on and used the Alaska Peninsula and surrounding marine environment for thousands of years. The lands and waters surrounding present-day King Cove therefore have a history of Indigenous use that predates development of the modern community. The modern King Cove townsite developed beginning in 1911, when Pacific American Fisheries constructed a salmon cannery. Early settlers were Scandinavian, European and Unangan fishermen. Of the first ten founding families, five consisted of a European father and an Aleut mother. The City of King Cove was officially incorporated in 1949. The cannery operated continuously from 1911 to 1976, when it was partially destroyed by fire. Its rebuilding was spurred by the adoption of the 200-mile fisheries limit. While King Cove remains tied to fishing and fish processing, the 2024 closure of the Peter Pan Seafoods processing complex had a major economic impact on the community.

## H.2.3 Population

As of 2016, there are 467 registered Agdaagux Tribal Members. According to the 2024 ACS Census, the population of King Cove was 1,352.

## H.2.4 Demographics

The demographics of the Agdaagux Tribe are majority Alaska Native but not enough data exists to determine the demographics of tribal members of two or more races.

For the whole geography of King Cove, demographics are a mix of non-Native and Unangan residents. According to the 2020 census data, 327 residents identified as Alaska Native or American Indian, 213 identified as White, 109 identified as Asian, 29 identified as some Other Race, 10 identified as Black or African American, 6 identified as Native Hawaiian and Other Pacific Islander, and 63 identified as two or more races, with 48 of those residents identifying as White and Alaska Native or American Indian.

## H.2.5 Economy

The Agdaagux Tribe's members are closely connected to the year-round commercial fishing and seafood processing industries in King Cove. While the closure of the Peter Pan processing facility significantly impacted the community's economy, several smaller processing facilities are still in operation. Sixty-two residents hold commercial fishing permits. Subsistence harvesting also provides important food resources, including salmon, caribou, geese, and ptarmigan, supplementing household food supplies and reducing reliance on purchased food.

## H.2.6 Land Use

Due to the provisions of the ANCSA, the regional and village native corporations received title to property in their traditional lands. The King Cove Corporation holds title to significant surface lands while The Aleut Corporation holds title to the subsurface resources.

King Cove is defined by commercial and industrial infrastructure related to the fishing industry, with a small concentration of land dedicated to residential buildings. The undeveloped land surrounding King Cove is primarily Alaska Native Land, owned by the King Cove Corporation. Tribal members use the land surrounding King Cove for subsistence, cultural, and recreational purposes. Consequently, the Tribe's hazard-mitigation geography is not limited solely to developed parcels or buildings within the community. Access to areas used for subsistence and cultural purposes, and the resources associated with those areas, may also be relevant when evaluating hazard vulnerability and potential mitigation needs.

## H.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update. Newly available data and information were evaluated and incorporated throughout the document, with relevant sources referenced where appropriate.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **1968 King Cove Alaska Comprehensive Development Plan** | Establish a long-term framework for King Cove's land use, transportation, infrastructure, and community development. | Used to identify infrastructure and land use planning for the HMP Update. |
| **1981 City of King Cove Alaska Comprehensive Plan** | Evaluate population, land use, housing, transportation, utilities, and community facilities to guide future community expansion. | Used to identify hazard areas, infrastructure and land use planning for the HMP Update. |
| **2003 City of King Cove Waterfront Utilities Plan** | Assess waterfront utility needs and identify infrastructure improvements to support future waterfront and harbor development. | Used to identify hazard areas, infrastructure and utility use planning for the HMP Update. |
| **2006 Comprehensive Community Plan** | Assess existing conditions and establish goals, policies, and land-use priorities for King Cove's future growth and development. | Used to identify hazard areas, infrastructure and land use planning for the HMP Update. |
| **2007 USACE Erosion Information Paper- King Cove** | Baseline erosion assessment of the community. | Used to describe historical erosion locations, rates, and impacts in the communities where reports were available. |
| **2010 & 2021 Aleutians East Borough MJHMP** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **2016 Tsunami Inundation Maps for King Cove and Cold Bay Communities, Alaska** | Identify potential tsunami hazards for the geographies and model the extent of tsunami waves generated earthquake and landslide events. | Referenced data in Tsunami hazard profile/annex. Used inundation maps as the data source for potential losses due to tsunami event. |

Source: State of Alaska Community Plans Library, E.N. Suleimani, D.J. Nicolsky, R.D. Koehler, J.T. Freymueller, and A.E. Macpherson 2016

# H.4 Risk Assessment

## H.4.1 Hazards

The Agdaagux Tribe of King Cove Planning Team identified the following natural hazards that may impact their geography/community.

- ✓ Hazard profiled for this jurisdiction in the MJHMP Update
- X Hazard not profiled for this jurisdiction in the MJHMP Update

- X Changes in the Cryosphere- Sea Ice
- ✓ Changes in the Cryosphere- Snow Avalanche
- ✓ Dam Failure
- ✓ Earthquake
- ✓ Flood
- ✓ Ground Failure/Landslide
- X Invasive Species
- ✓ Sediment Deterioration and Land Destabilization
- ✓ Severe Weather
- ✓ Tsunami
- ✓ Volcano
- X Wildland Fire

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere- Sea Ice | Did not profile this hazard. | | |
| Cryosphere- Snow Avalanche | 2- Possible | 4- Catastrophic | King Cove is vulnerable to avalanches due to its steep and rugged mountainous terrain, heavy snowfall, strong winds, and rapidly changing winter weather conditions. Avalanches can occur on steep slopes and may be triggered by heavy snowfall, wind loading, rain, warming temperatures, or seismic activity.<br>The 2021 Aleutians East Borough Hazard Mitigation Plan identifies three avalanche-prone areas in and around King Cove.<br>The Planning Team reported an avalanche on February 1, 2012. This avalanche reportedly struck the Alaska Commercial (AC) Store. |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and King Cove itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 2- Possible | 2- Limited | Sediment deterioration and land destabilization can occur throughout King Cove, with coastal land destabilization being the biggest concern for the community. Since King Cove is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.<br>Riverine land destabilization isn't identified as a concern for the community.<br>According to a 2007 USACE study, erosion occurs along Gould's Lagoon shoreline and that the roadway connecting the Old Ram and New Ram subdivisions is the most vulnerable. |
| Flood | 3- Likely | 2- Limited | According to the Aleutians East Borough Planning Team, W Lagoon Rd in King Cove experiences annual flooding related to the King Tide. During the 2025 event, flooding cut off a portion of W Lagoon Rd, which resulted in 30-40 people unable to access or leave their homes.<br>Due to the absence of major rivers, riverine flooding is not considered a significant hazard, according to the Planning Team. Historical flooding has generally been limited to localized inundation of low-lying coastal areas, harbor facilities, and roadways during severe North Pacific storms. |
| Ground Failure/ Landslide | 2- Possible | 2- Limited | King Cove is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity. |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of King Cove is susceptible to severe weather events and impacts.<br>The Planning Team reported that King Cove experiences some of the most severe winter storms in Alaska because of its location on the Pacific side of the Alaska Peninsula. The community is frequently affected by powerful North Pacific low-pressure systems that produce hurricane-force winds, heavy snow, freezing rain, blizzard conditions, and coastal flooding. |
| Tsunami | 3- Likely | 4- Catastrophic | King Cove is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. Most critical facilities and infrastructure in King Cove are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community. |
| Volcano | 3- Highly Likely | 3- Critical | The entire geography of King Cove is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof. |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | Volcanic ashfall is the primary volcanic hazard that may impact King Cove.<br>King Cove is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, King Cove has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community. |
| Wildland Fire | Did not profile this hazard. | | |
| Dam Failure | 2- Possible | 3- Critical | There are two dams in King Cove, both owned by the City. The two proposed High hazard dams in King Cove are the Clear Creek Dam and Delta Creek Dam. There has not been a history of dam failure in King Cove. |
| Invasive Species | Did not profile this hazard. | | |

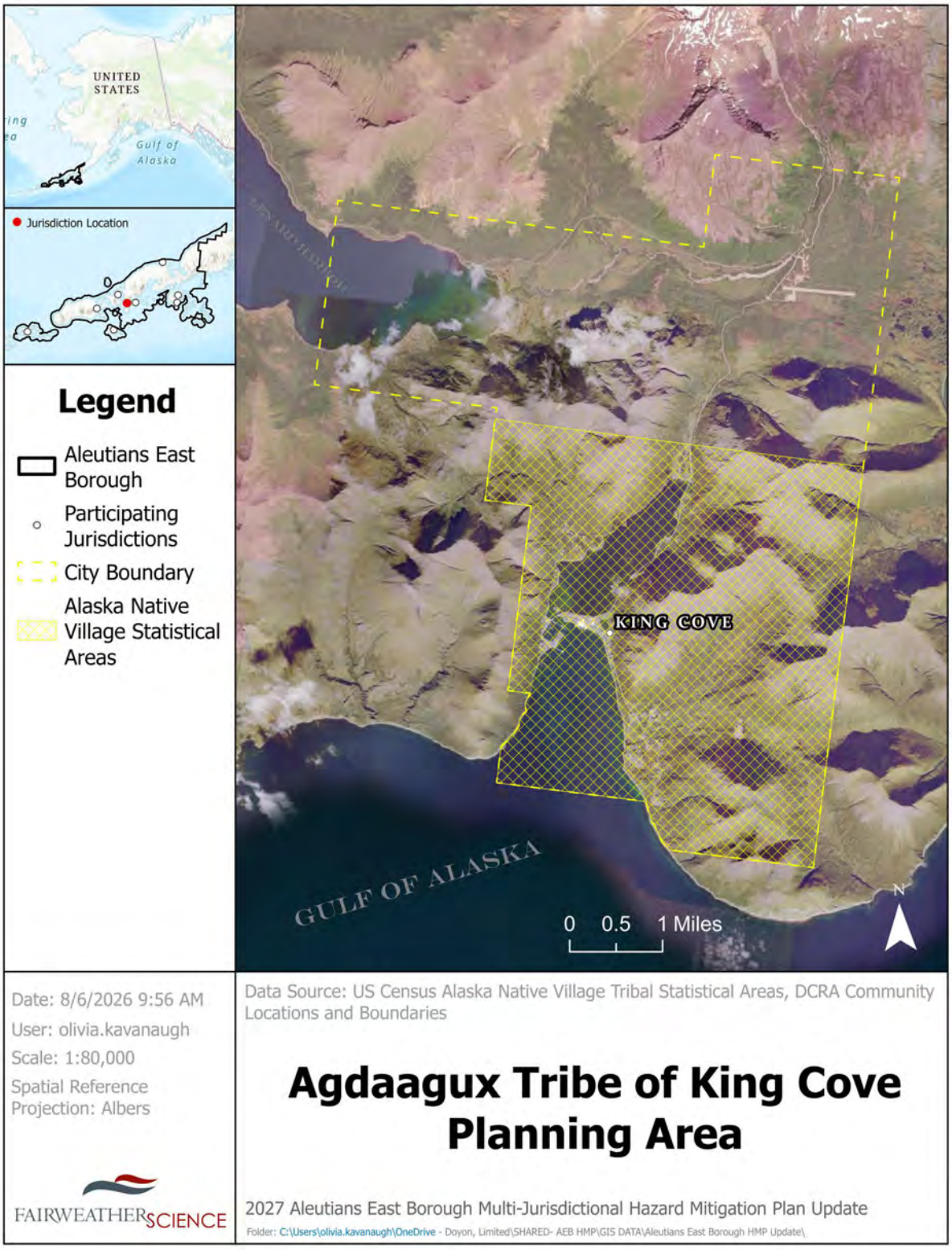



**Figure H-1- Agdaagux Tribe of King Cove Planning Area**

#### H.4.1.1 Changes in the Cryosphere- Sea Ice

The Agdaagux Tribe of King Cove Planning Team did not select this hazard to be profiled in the MJHMP Update.

### H.4.1.2 Changes in the Cryosphere- Snow Avalanche

#### H.4.1.2.1 Location

The 2021 Aleutians East Borough Hazard Mitigation Plan identifies three avalanche-prone areas in and around King Cove (Figure H-2). Although no damaging avalanches have been recorded there recently, these paths remain active hazard zones during winters with heavy snowfall and rain-on-snow events.

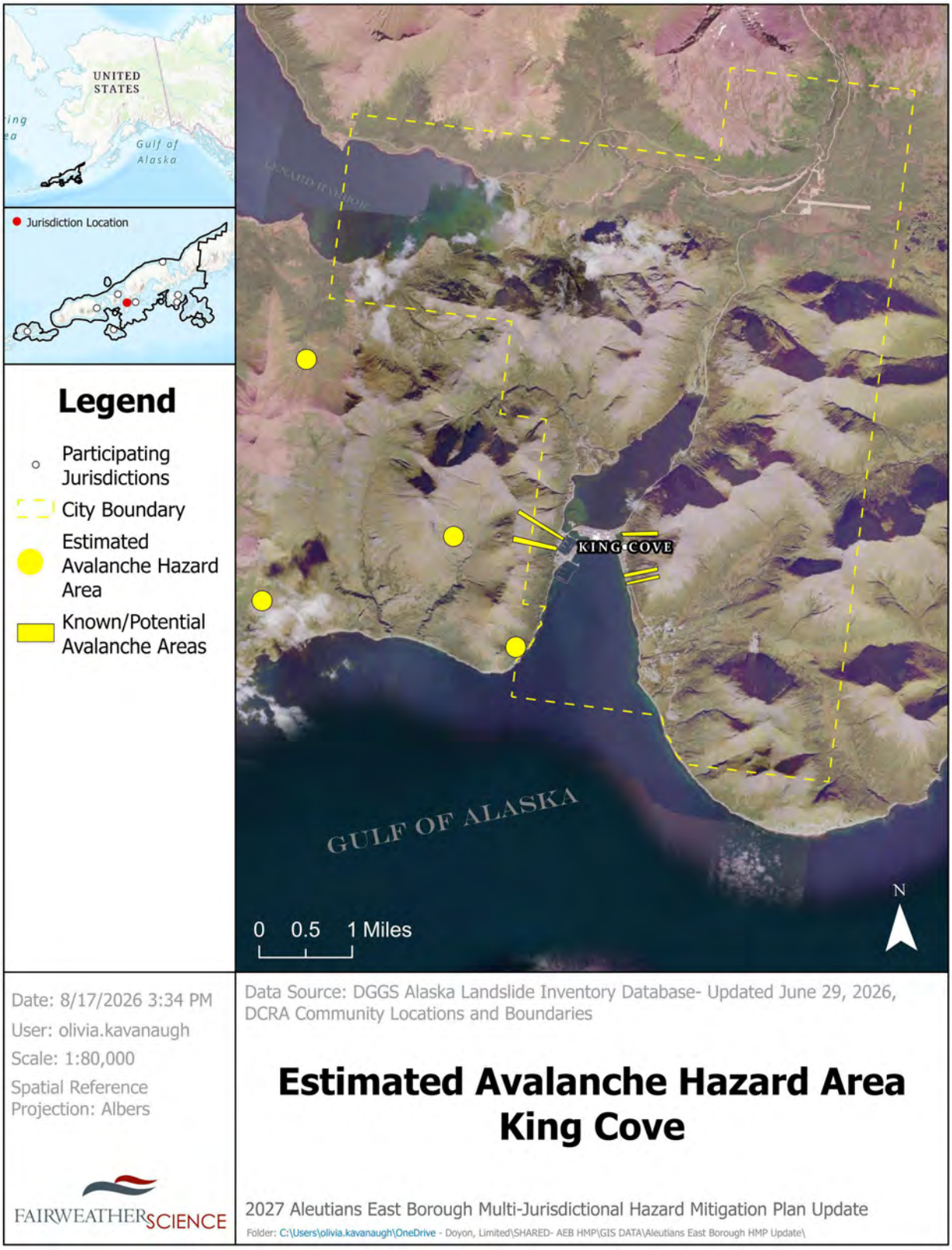



**Figure H-2- King Cove Avalanche Hazard Areas**

#### H.4.1.2.2 History

An *Anchorage Daily Times* article of 1960 describes an event in which a dwelling in King Cove was flattened by strong winds during a snow storm at approximately 10 p.m. on January 19, 1960. Five young children and one adult died during this event. In the article, their deaths are attributed to exposure while pinned under the wreckage of their home, which was blown over by winds of about 60 knots. The temperature was reported to be 18 degrees F at the time.

Community oral history provided through the City of King Cove also describes a destructive event remembered as occurring sometime in the 1950s or 1960s. Elders recalled a mud and rock avalanche coming down near Ram's Creek Road, striking a house, carrying it toward the beach, and continuing to the bay. The timing and some details of the oral account overlap with the documented 1960 event, while other details differ. It is therefore unclear whether the written and oral accounts represent different descriptions of the same event or document separate events. Both are retained here as part of King Cove's documented and community-remembered hazard history.

Avalanche impacts have also occurred more recently. The Planning Team reported an avalanche on February 1, 2012. This avalanche reportedly struck the Alaska Commercial (AC) Store. An article from the Bristol Bay Times by Hannah Heimbuch, dated March 9, 2012, described this impact on the community:

> *AC Store Manager, Jeff Watt, said he and several other employees typically would have been there at the time-around 7:50 p.m. on February 1-but weather had prompted him to send everyone home early just 20 minutes before. When the crew arrived early the next morning, they noticed a few inches of water on the sales floor, leaking from broken pipes. The scene in the warehouse was more severe, with a snow slide taking up a large part of the room, 12 to 14 feet at its deepest level. The store stocks large appliances like washers, dryers and refrigerators, and of the 12 units stored in the warehouse, only two survived intact. 'It tossed one about 30 feet before it ran into something else,' Watt said. With such a heavy appliance getting tossed around like a basketball, Watt and his employees were fortunate to be on their way home when the snow hit. It took several bobcats and 20 people several days to get the snow cleared from the warehouse and clearing damaged merchandise and taking inventory took employees another two weeks.*
>
> *This has been a particularly undecided winter on the peninsula and in King Cove, with seriously fluctuating temperatures and high snowfall, which makes for an unstable snow pack. This was one of several avalanches that occurred over the span of a few days-albeit one of the most destructive seen in years. 'They've had a couple of avalanches at this store before,' Watt said, 'But it's opened the door a couple of feet. (This) probably came into my building a couple of hundred feet.*

There have been no documented avalanches in King Cove during the last five years (2021-2026). However, avalanche hazard remains a recognized risk for the community because of the steep mountains immediately above portions of the town.

#### H.4.1.2.3 Extent (Magnitude and Severity)

King Cove has experienced at least one documented damaging avalanche in recent history when an avalanche struck the Alaska Commercial (AC) Store on February 1, 2012. Community members also report a historic avalanche more than 50 years ago that destroyed a residence. Although no recent avalanche incidents have occurred, continued development near steep slopes, changing winter weather patterns, and increased rain-on-snow events support maintaining avalanche hazards as a planning concern. According to these historic accounts, snow avalanches in King Cove can be 12 to 14 deep.

Based on the extent of past snow avalanche events and the criteria identified in Table 5 of the Base Plan, the extent of snow avalanche in King Cove is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### H.4.1.2.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team does not report any specific previous impacts to geography/land from snow avalanches in King Cove. |
| Infrastructure | The 2012 reported avalanche event damaged the Alaska Commercial (AC) store, including water damage from broken and leaking pipes. The Planning Team reports that there has been no damage from snow avalanches to homes, business, or public facilities in King Cove. |
| People | On January 19, 1960, a winter storm event with a reported avalanche resulted in the deaths of six people, who reportedly died from exposure after being pinned in their houses. The Planning Team reports that there have been no other injuries or fatalities from avalanches in King Cove. |
| Utilities | The Planning Team does not report any specific previous impacts to utilities from snow avalanches in King Cove. |
| Transportation | The Planning Team does not report any specific previous impacts to transportation from snow avalanches in King Cove. |
| Economy | The Planning Team does not report any specific previous economic impacts due to snow avalanches in King Cove. |
| Subsistence Resources | The Planning Team does not report any specific previous impacts to subsistence resources from snow avalanches in King Cove. |

#### H.4.1.2.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that King Cove will experience a snow avalanche event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### H.4.1.2.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of snow avalanche hazards in Alaska. |
| Location | It is possible future climate conditions will influence the location of snow avalanche hazards in Alaska. As warmer, wetter winters become more prevalent, heavy-snow avalanches may occur on different slopes that have not historically experienced avalanches. |
| Extent | Future climate conditions are likely to influence the magnitude and severity of avalanches. Avalanche activity is determined by several factors, including snowpack type, internal liquid volume, air temperature, precipitation, elevation, slope, ground cover, etc. An increase in liquid content within snowpack, from increased December-March air temperature and January-February increased precipitation, may lead to greater occurrence of wet snow avalanches, especially in late winter/early spring (Ballesteros-Canovas et al. 2018). |
| Impact | Future climate conditions are likely to influence the impact of avalanches. As snowpack experiences greater liquid volume, avalanche risk will increase (Ballesteros-Canovas et al. 2018). As snowpack retreats to higher elevations due to |

| Description of Future Conditions | |
|---|---|
| | reduced snowpack and quickened melt, the impacted area will also shift upwards. Impacts in this scenario will likely be due to loss of water supply, affecting culture, wildlife resources, and tourism (IPCC 2018). Infrastructure in avalanche hazard zones may also be impacted by an increase in frequency and extent of wet snow avalanches. Damage to structures may vary depending on the impact pressure of the avalanches. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of future avalanche events in the Aleutians East Borough Planning Area. Some studies suggest that a warming climate may increase avalanche risk due to changes in snow accumulation and moisture content, as well as loss of snowpack stability because of changing air temperature (DGGS 2023d). Ballesteros-Canovas et al. (2018) predicts an increase in avalanche activity in the 2nd half of the 21st century; largely wet-snow avalanches due to increased air temperature and precipitation. |
| Population Patterns | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in the Aleutians East Borough Planning Area. However, this is jurisdiction dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in construction moving outside of avalanche zones. Due to the cost and difficulty of building in the Aleutian Islands, it is possible that if a home is damaged by an avalanche that the residents may move out of the community completely. |
| Land Use Development | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in the Aleutians East Borough Planning Area. However, this is jurisdiction dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in land use which promotes development outside of possible avalanche slide paths. |
| Subsistence Resources | Future climate conditions are not anticipated to influence subsistence resources as they relate to avalanche hazards. |

### H.4.1.3 Dam Failure

There are four dams in King Cove, all owned by the City. The two proposed High hazard dams in King Cove are the Clear Creek Dam and Delta Creek Dam. Two other dams, Old Rams Creek Dam and Waterfall Creek Dam, have an unknown hazard classification.

Figure H-3 shows the location of the dams in King Cove as well as the potential inundation area if the dam were to fail.

As formal dam failure inundation mapping has not been completed for these dams, dam failure hazard areas in the community were identified by buffering the 1-mile downstream route by 0.1 miles (528 feet). This methodology does not account for site-specific topography or hydrology and may over or underestimate dam failure hazard areas in the community.

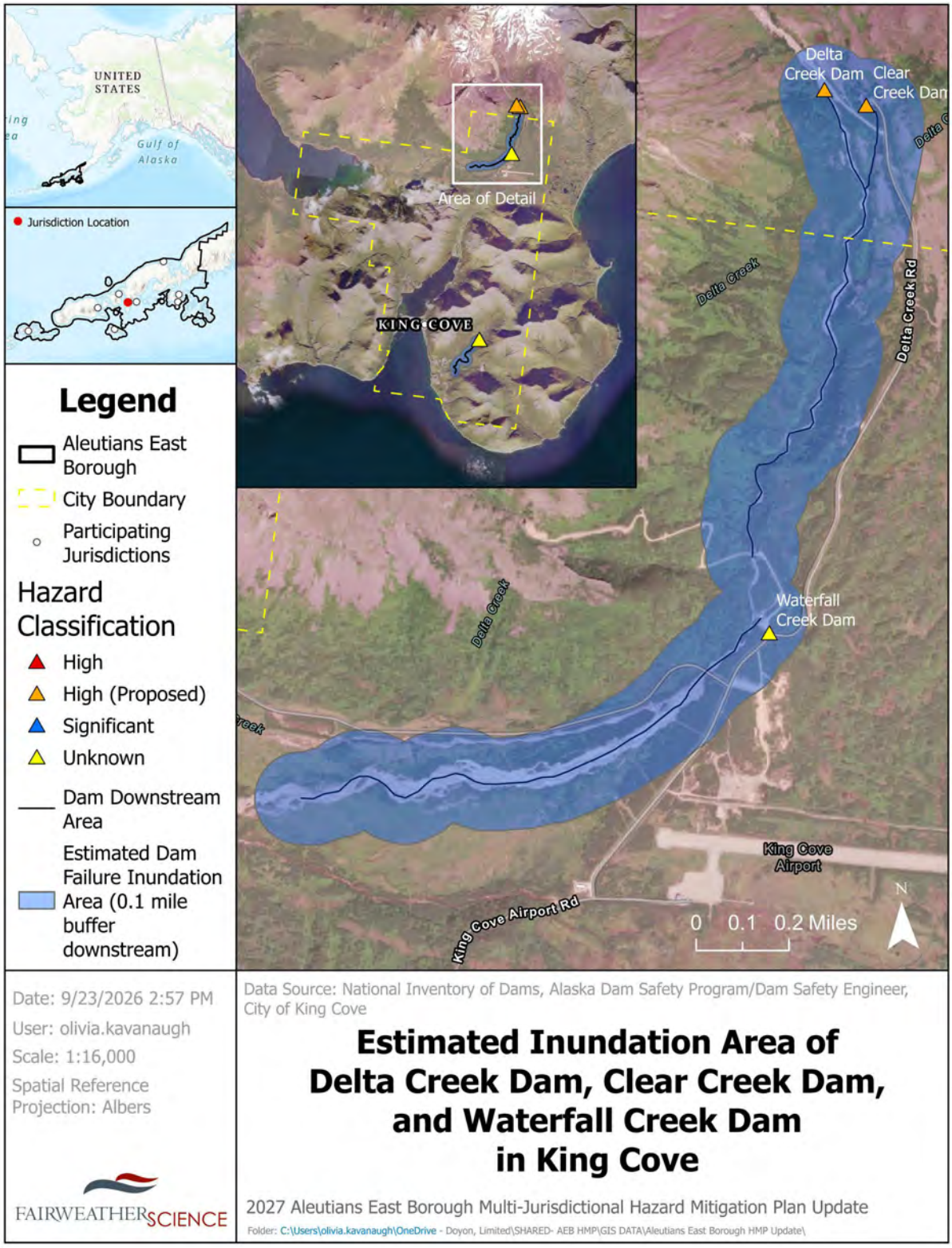



**Figure H-3- Location and Estimated Inundation Area of Delta Creek Dam, Clear Creek Dam, and Waterfall Creek Dam in King Cove**

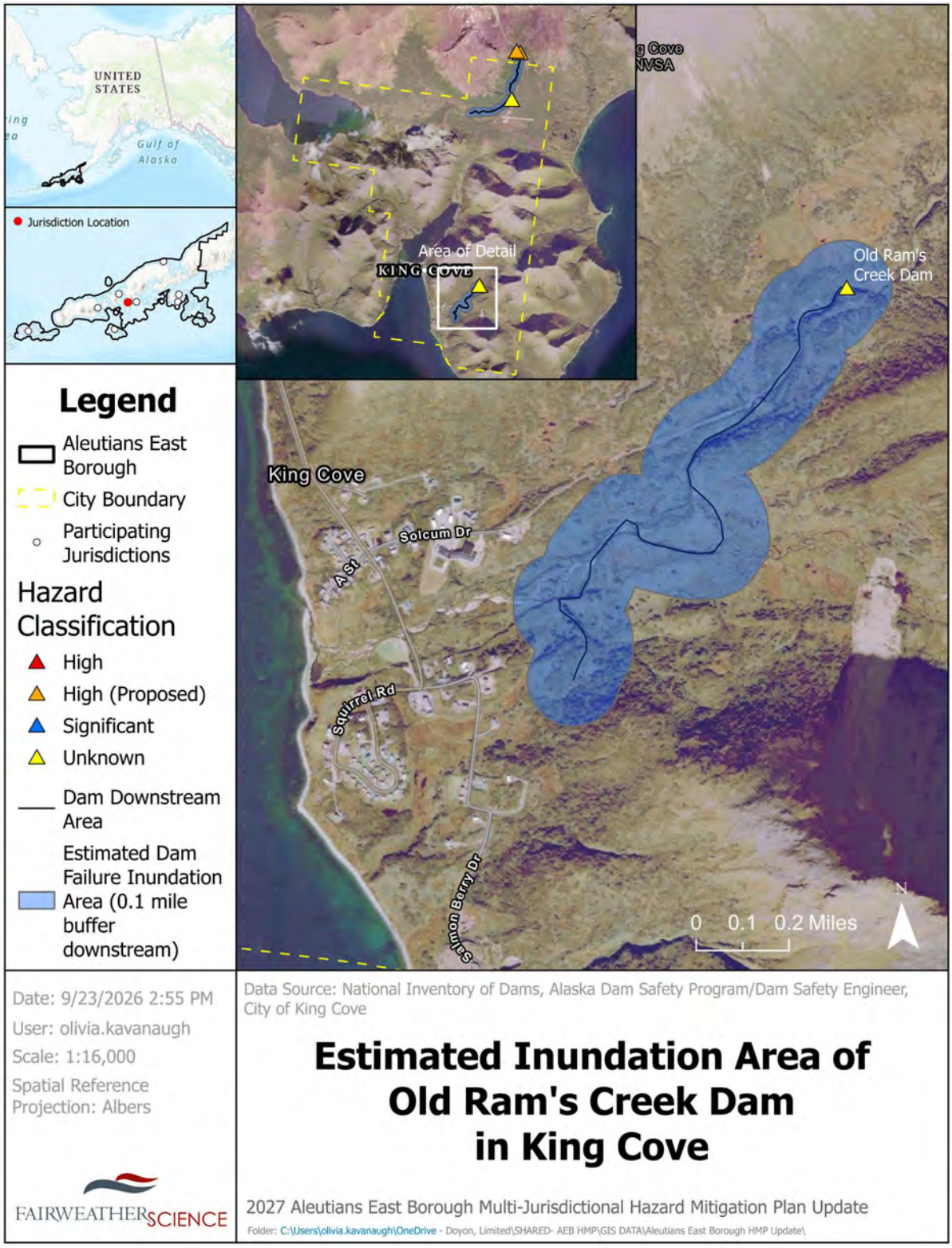



**Figure H-4- Location and Estimated Inundation Area of Old Ram's Creek Dam in King Cove**

| Clear Creek Dam | |
|---|---|
| Hazard Classification | High (Proposed by Alaska State Dam Engineer) |
| Owner | City of King Cove |
| Year Built | Unknown |
| Dam Type | Concrete |
| Dam Purpose | Hydroelectric |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | There is no information available about the inspection frequency of Clear Creek Dam, or the last inspection date. |
| Downstream Description | The dam outflow consists of a continuation of Clear Creek, which flows approximately 0.25 miles before its confluence with Delta Creek. Delta Creek flows another 4.5 miles downstream before depositing into Lenard Harbor. |
| Downstream Area | The Dam is located east of Anvil Mountain, in low shrub, alpine habitat. Clear Creek (the outflow) flows to its confluence with Delta Creek which then flows into more vegetated, lower lying lands for 4.7 miles before draining into Lenard Harbor. There are numerous roadways and two bridges downstream of the dam. |
| Downstream Dams | There are no dams immediately downstream of the Clear Creek Dam. |
| Downstream Bridges | There are three (3) bridges downstream of Clear Creek Dam. The first bridge allows Reservoir Dam Road to pass over Clear Creek approximately 300 feet downstream of the dam. The next two bridges occur downstream of the confluence of Clear Creek and Delta Creek, which means they are at risk of possible inundation from two different dams. The second bridge is approximately 0.9 miles downstream, allowing Waterfall Creek Road to pass over Delta Creek. The second bridge is approximately 1.1 miles downstream and allows AEB Route 1 to pass over Delta Creek. |
| Reservoir Area | The reservoir is continuously fed by Clear Creek upstream of the dam. The reservoir is narrow, approximately 150 feet long and 60 feet wide. |
| Downstream Development | King Cove Airport is located 1.5 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam. |
| General findings of the last inspection | There is no data available on the date of the last dam inspection, or what the condition assessment of Clear Creek dam is currently. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of Clear Creek and Delta Creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Clear Creek Dam. Based on the State of Alaska Dam Safety Engineer's preliminary inspection, critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: State of Alaska Dam Safety Engineer 2025, NHA 2023



Source: NHA 2023

**Figure H-5- Clear Creek Dam**

| Delta Creek Dam | |
|---|---|
| Hazard Classification | High (Proposed by Alaska State Dam Engineer) |
| Owner | City of King Cove |
| Year Built | 1975 |
| Dam Type | Concrete |
| Dam Purpose | Hydroelectric |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | No information is available on the inspection frequency of the Delta Creek Dam. |
| Downstream Description | The dam outflow consists of a continuation of Delta Creek, which flows approximately 0.25 miles before Clear Creek joins Delta Creek. From Delta Creek Dam, Delta Creek flows another 4.7 miles downstream before depositing into Lenard Harbor. |
| Downstream Area | The Dam is located east of Anvil Mountain, in low shrub, alpine habitat. Delta Creek (the outflow) then flows into more vegetated, lower lying lands for 4.7 miles before. There are numerous roadways and two bridges downstream of the dam. Clear Creek dam is also downstream of Delta Creek Dam. |
| Downstream Dams | There is one (1) dam downstream of the Delta Creek Dam. Clear Creek Dam is located approximately 450 feet downstream and to the east of the Delta Creek Dam-Clear Creek Dam is not located in the same water drainage of Delta Creek Dam. |
| Downstream Bridges | There are two (2) bridges downstream of Delta Creek Dam. The first bridge is approximately one mile downstream, allowing the Waterfall Creek Road to pass over Delta Creek. The second bridge is approximately 1.25 miles downstream and allows AEB Route 1 to pass over Delta Creek. |
| Reservoir Area | The reservoir area is very small, with an approximate length of 90 feet and width of 45 feet. The reservoir is continuously fed by Delta Creek. |
| Downstream Development | Although it never crosses Delta Creek, Airport Road parallels the creek for approximately 1.8 miles. King Cove Airport is located 1.6 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam. |
| General findings of the last inspection | No information has been made available about the dam's most recent inspection, or what condition it was rated. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of Delta Creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Delta Creek Dam. |

Source: State of Alaska Dam Safety Engineer 2026, NHA 2023

| Old Rams Creek Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of King Cove |
| Year Built | 1975 |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | The length of the dam is approximately 45 feet long. The height is unknown. |
| Drainage Area | Unknown |
| Inspection Frequency | The dam is inspected annually by the City of King Cove Public Works Department The last inspection was conducted in 2025. |
| Downstream Description | The dam outflow consists of a small, narrow outflow creek, Ram Creek. Ram Creek Dam Road parallels Ram Creek the entire length of the creek. The creek runs through typical Aleutian vegetation, primarily alders and salmonberry bushes and devoid of trees. The creek terminates 1.6 miles downstream of the dam into King Cove. |
| Downstream Area | The Dam is located Southwest of the city of King Cove. The most recent inspection noted the access trail from the Water Pumphouse to the dam was engulfed by salmonberry bushes, cow parsnip, and alder trees. |
| Downstream Dams | There are no dams immediately downstream of the Old Rams Creek Dam. |
| Downstream Bridges | There is one (1) bridge downstream of Old Rams Creek Dam. Approximately 1.5 miles downstream, a bridge crosses over the outflow stream, allowing Rams Creek Road to pass over the top. |
| Reservoir Area | Unknown |
| Downstream Development | Ram Creek Dam Road parallels Ram Creek the entire length of the creek. Approximately 1.5 miles downstream of the dam, King Cove School, King Cove Powerhouse and multiple residential structures are located North of the creek. South of the creek, immediately adjacent to the creek, is the King Cove Baseball Field, and approximately 0.2 miles South is the King Cove Public Works building and the Agdaagux Tribe of King Cove building. |
| General findings of the last inspection | No definitive inspection rating was given to Old Rams Creek Dam during the 2025 inspection. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Old Rams Creek Dam. Based on the critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: City of King Cove Planning Team

| Waterfall Creek Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of King Cove |
| Year Built | 2017 |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | The dam is approximately 60 feet long; the height is unknown. |
| Drainage Area | Unknown |
| Inspection Frequency | Waterfall Creek Dam is inspected annually by the City of King Cove Public Works. The last inspection was conducted in 2025. |
| Downstream Description | The dam outflow immediately flows into Delta Creek. Approximately 0.25 miles downstream, the water pumphouse is adjacent to the creek. The False Pass school, Mountain Valley Road, and the Isanotski Cemetery. |
| Downstream Area | Although it never crosses Delta Creek, Airport Road parallels the creek for approximately 1.8 miles. King Cove Airport is located 1.6 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam |
| Downstream Dams | There are no dams immediately downstream of the Waterfall Creek Dam. |
| Downstream Bridges | There is one (1) bridge downstream of Waterfall Creek Dam. Approximately 0.25 miles downstream, a bridge crosses over the Delta Creek Dam, allowing AEB Route 1 to pass over. |
| Reservoir Area | Unknown |
| Downstream Development | The AEB Route 1 parallels Delta Creek for most of the route between the dam and King Cove. While approximately 1.2 miles to the South of Delta Creek, the King Cove Airport is downstream of the dam as well. The Water Pumphouse is the first structure downstream of the dam, approximately 0.25 miles downstream. There is no other development downstream of the dam. |
| General findings of the last inspection | There was no definitive inspection rating given to Waterfall Creek Dam during the 2025 inspection. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Waterfall Creek Dam. Based on the critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: City of King Cove Planning Team

#### H.4.1.3.1 History

There is no history of dam failure in King Cove.

#### H.4.1.3.2 Extent (Magnitude and Severity)

Heavy rainfall and flood events may affect the structural integrity of dams that would affect the King Cove. Other natural hazards that are less predictable/ forecastable, like landslides or earthquakes, can also impact the structural integrity of dams and could lead to failure. Poor or infrequent maintenance, seismic activity, and severe weather can also weaken the integrity of a dam.

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation for all dams in King Cove was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

See Figure H-3 for potential inundation area from Delta Creek Dam, Clear Creek Dam, and Waterfall Creek Dam and Figure H-4 for potential inundation area from Old Ram's Creek Dam.

Based on the most recent condition assessments and the criteria identified in Table 5 of the Base Plan, the magnitude and severity of dam failure in King Cove is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### H.4.1.3.3 Impact

| Description of Impact | |
|---|---|
| Geography/Land | While there are no historic dam failures near King Cove, changes in the Clear or Delta Creek bed could be an impact of a dam failure. have resulted in shaking of landscapes, there are no documented changes to King Cove's geography from past earthquakes. |
| Infrastructure | There are no recorded dam failure impacts on infrastructure in King Cove. |
| People | There are no documented cases of serious injuries, deaths, or health effects from dam failure in King Cove. |
| Utilities | While dam failure could impact electricity supply in King Cove, there have been no documented cases of dam failure causing utility disruptions in King Cove. |
| Transportation | The primary transportation related impacts from a dam failure in King Cove are aircraft and vehicle interruptions. Impacts to air transportation associated with dam failure are the potential for infrastructure damage to the Airport Terminal and Runway due to flooding, and flooding of roadways accessing the airport or other upland access. |
| Economy | There are no recorded economic impacts due to dam failure in King Cove. |
| Subsistence Resources | There have been no recorded cases of a dam failure in King Cove that has impacted the community's access to subsistence resources. |

#### H.4.1.3.4 Probability of Future Events

Based on the criteria listed in Table 6 of the Base Plan and the most recent condition assessments, it is **Possible** that King Cove will experience a dam failure event in the calendar year; the event is probable within the next five years, the event has up to 1 in 5-year (1/5=20%) chance of occurring. History of events is less than or equal to 20%.

However, the State of Alaska Dam Safety Engineer warned of "condition creep", where observational assessments of AEB dams have rated dams more poorly than their most recent available condition rating. If dams in King Cove continue to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### H.4.1.3.5 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in King Cove. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in King Cove. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in King Cove. A potential outcome of changing climate in Alaska is an increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in King Cove. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in King Cove. Increased precipitation and frequency of severe weather events could contribute to more stress on dams in King Cove. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in King Cove as residents may relocate in and out of potential future inundation areas. Residents of King Cove may also relocate out of the area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in King Cove. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted in inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in False Pass.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes.

### H.4.1.4 Earthquake

#### H.4.1.4.1 Location

The entire geography of King Cove is vulnerable to earthquakes, due to its location on the Alaska-Aleutian subduction zone.

According to the 2023 State of Alaska HMP, King Cove is located in an area with the potential of **severe perceived shaking from earthquakes (PGA 34 – 65)** (Figure H-6). Perceived shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. This map focuses on the actual variations in shaking intensity across a region as felt by people and structures.

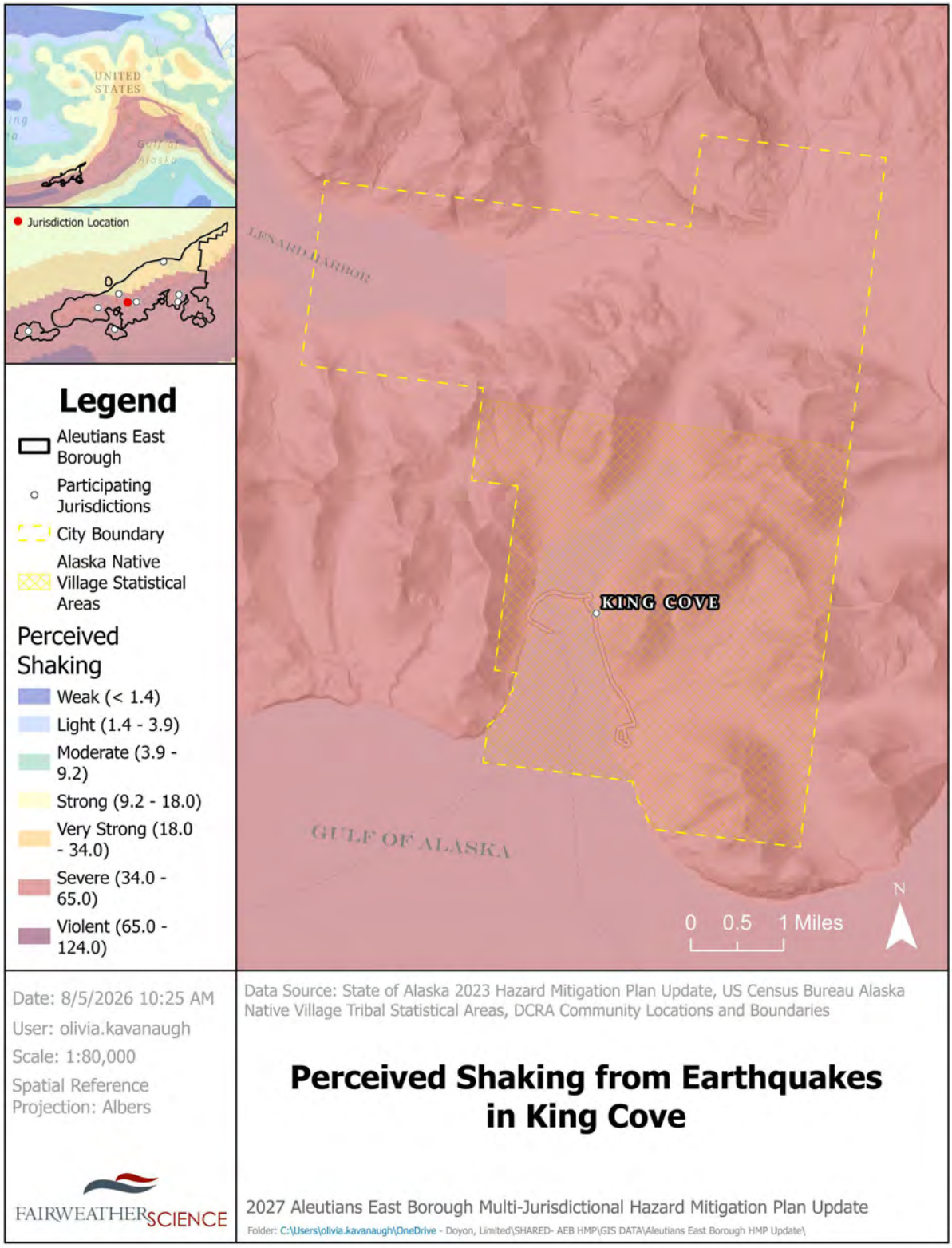



**Figure H-6- Perceived Shaking from Earthquakes in King Cove**

#### H.4.1.4.2 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including King Cove can be found in Table 11 of the Base Plan.

#### H.4.1.4.3 Extent (Magnitude and Severity)

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding the traditional lands of the Agdaagux Tribe of King Cove and King Cove experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Based on the extent of past earthquake events and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in the traditional lands of the Agdaagux Tribe of King Cove is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### H.4.1.4.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | While historical earthquakes near King Cove have resulted in shaking of landscapes, there are no documented changes to King Cove's geography from past earthquakes. Future earthquakes could create ground sink an/or cause landslides |
| Infrastructure | Historical earthquakes impacting the Agdaagux Tribe of King Cove have resulted in relatively minor physical damage to community infrastructure. Future earthquakes have the potential to flatten structures, damage roadways and dams, and other infrastructure. |
| People | There are no documented cases of serious injuries or health effects from an earthquake in King Cove. Historical earthquakes have generally resulted in felt shaking and resultant hazards (tsunami warnings) rather than widespread harm to residents.<br>The July 16, 2025, Magnitude 7.3 earthquake was the most significant seismic event affecting King Cove in the past five years.<br>Effects in King Cove included:<br>• Strong shaking felt throughout the community.<br>• A tsunami warning was issued for the Alaska Peninsula.<br>• Residents evacuated to higher ground as a precaution.<br>• The warning was later downgraded and canceled.<br>• No significant injuries or structural damage were reported.<br>• Numerous aftershocks followed over the next several days. |
| Utilities | While strong shaking could damage utility equipment causing outages, there have been no documented cases of earthquakes causing utility disruptions in King Cove. |
| Transportation | The primary transportation related impacts from an earthquake in King Cove are aircraft and vehicle interruptions. Impacts to air transportation associated with earthquakes are the potential for infrastructure damage to the Airport Terminal and Runway as well as potential tsunami related impacts to floatplanes landing or taking |

| Description of Impact | |
|---|---|
| | off if a significant wave occurs during that time. A tsunami could also damage boat harbors and marine vessels. Earthquakes of large magnitude have the potential to cause severe damage to roads and other transportation infrastructure. |
| Economy | There are no recorded economic impacts due to earthquakes. |
| Subsistence Resources | There have been no recorded cases of an earthquake in King Cove that has impacted the community's access to subsistence resources. |

#### H.4.1.4.5 Probability of Future Events

King Cove is located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing King Cove. During the past five years, the community experienced numerous earthquakes, including the July 16, 2025, magnitude 7.3 earthquake south of Sand Point, which generated strong ground shaking and a tsunami warning requiring precautionary evacuations. While no major damage occurred, the event demonstrated the community's continued exposure to significant seismic and tsunami hazards. Given King Cove's location along the Alaska-Aleutian subduction zone, future damaging earthquakes remain highly probable and continue to represent one of the Tribe's greatest natural hazard risks.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that there will be an earthquake of any magnitude within 100 miles of King Cove within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and based on the history of events, the probability of occurrence is greater than 33% likely per year.

#### H.4.1.4.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of earthquake events in King Cove is not anticipated to change in the future. |
| Location | The location of earthquake events in King Cove is not anticipated to change in the future. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of earthquakes in King Cove. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of earthquakes in King Cove. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future earthquake events in King Cove. Earthquakes are impossible to predict. |
| Population Patterns | Due to the unknown location of earthquake hazards in King Cove, it is possible that future earthquakes will impact future population patterns. Depending on the severity of the event, an earthquake in King Cove could displace residents located within the inundation area, which could leave some residents without viable housing options. |

| Description of Future Conditions | |
|---|---|
| Land Use Development | Future climate conditions are not anticipated to influence Land Use Development due to earthquakes in King Cove. |
| Subsistence Resources | Future climate conditions are not anticipated to influence earthquake related impacts on subsistence resources in King Cove. |

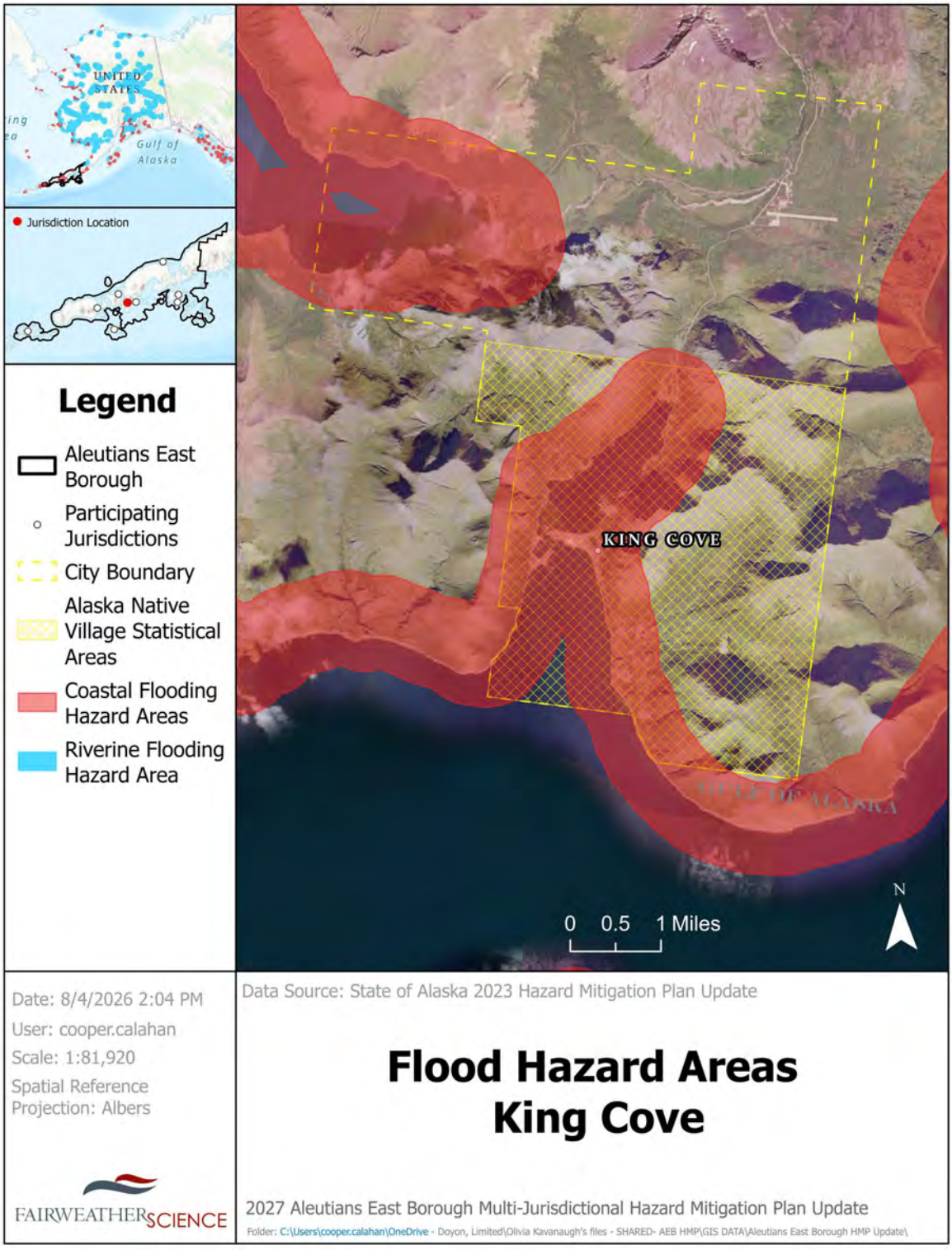
### H.4.1.5 Flood

#### H.4.1.5.1 Location

According to the 2023 State HMP, King Cove is within the identified Coastal Flooding Area (Figure H-7). The State of Alaska identifies coastal flooding hazard areas of 0.5 miles from the coastline (DHS&EM 2023).

Due to the absence of major rivers, riverine flooding is not considered a significant hazard, according to the Planning Team. Historical flooding has generally been limited to localized inundation of low-lying coastal areas, harbor facilities, and roadways during severe North Pacific storms.

The Planning Team indicated that Rams Creek and W Lagoon Rd experience flooding when strong winds combine with high tide.




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure H-7- King Cove Flood Hazard Areas**

#### H.4.1.5.2 History

NOAA's National Water Level Observation Network includes a historic flood event in King Cove. This was a storm surge event that occurred on October 23, 1977. Its impact is pending assessment.

The Planning Team reports the following notable flood events:

| Date | Event | Impacts |
|---|---|---|
| November 1974 | Coastal storm surge | High surf and coastal flooding affected low-lying shoreline areas and harbor facilities. Minor damage reported. |
| November 2011 | Bering Sea Superstorm | King Cove experienced storm surges, high waves, and localized coastal flooding. Marine facilities and transportation were affected, but catastrophic damage did not occur. |
| December 2020 | North Pacific winter storms | High tides, heavy rain, and strong winds caused localized ponding, shoreline erosion, and temporary flooding of low-lying areas. |
| 2021-2026 | Multiple coastal storms | Several storms produced minor coastal flooding, wave overtopping, and temporary roadway flooding, but no federally declared disasters specific to King Cove have been recorded. |

According to the Aleutians East Borough Planning Team, W Lagoon Rd in King Cove experiences annual flooding related to the King Tide. During the 2025 event, flooding cut off a portion of W Lagoon Rd, which resulted in 10-15 people unable to access or leave their homes.



Source: AEB 2025

**Figure H-8 – Flooding Along West Lagoon Rd in King Cove**

#### H.4.1.5.3 Extent (Magnitude and Severity)

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest has the lowest vulnerability.

King Cove tied for 59 out of 63 for flood threat ranking (Denali Commission 2019). While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking.

The Alaska DGGS Coastal Hazards Program reports that they do not have flood extent data for the Aleutians East Borough or its communities.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding in King Cove is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### H.4.1.5.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team did not report specific impacts to geography/land due to flood events in King Cove. |
| Infrastructure | The Planning Team did not report specific impacts to infrastructure due to flooding events in King Cove. |
| People | The Planning Team did not report personal injury or death related to flooding in King Cove. |
| Utilities | The Planning Team did not report specific impacts to utilities due to flooding events in King Cove. |
| Transportation | The Planning Team did not report specific impacts to transportation due to flood events in King Cove. |
| Economy | The Planning Team did not report specific economic impacts due to flooding events in King Cove. |
| Subsistence Resources | The Planning Team did not report specific impacts to subsistence resources due to flooding events in King Cove. |

#### H.4.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that King Cove will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### H.4.1.5.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in the Aleutians East Borough Planning Area as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the |

| Description of Future Conditions | |
|---|---|
| | Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br><br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in the Aleutians East Borough Planning Area is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in the Aleutians East Borough Planning Area, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in the Aleutians East Borough Planning Area. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br><br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br><br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021).<br><br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in the Aleutians East Borough Planning Area, however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |
| Population Patterns | It is possible that future flood events will cause changes in population patterns in the Aleutians East Borough Planning Area as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### H.4.1.6 Ground Failure/Landslide

#### H.4.1.6.1 Location

King Cove is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity.

King Cove area has underwater locations that display signs of submarine landslides. Further research is needed to map more areas of the sea floor to determine past and potential future submarine landslides.

Many landslide paths coincide with avalanche paths, especially at higher elevations. Unmapped areas within the Borough remain to be studied for landslide hazards and will be included in future updates of this plan as resources become available to evaluate those areas for landslide hazards.




**Figure H-9 - Historical Landslide Events Near King Cove**

#### H.4.1.6.2 History

According to the Alaska DGGS Library, there are seven (7) recorded landslides in the vicinity of King Cove, and one (1) recorded land flow in the vicinity of King Cove.

In 2021, King Cove residents stated that an avalanche occurred over 50 years ago and carried a house down the slope to the beach. An *Anchorage Daily Times* article of 1960 describes an event in which a dwelling in King Cove was flattened by strong winds during a snow storm at approximately 10 p.m. on January 19, 1960. Five young children and one adult died during this event. In the article, their deaths are attributed to exposure while pinned under the wreckage of their home, which was blown over by winds of about 60 knots. The temperature was reported to be 18 degrees F at the time. While the news report cites wind as the cause of the damage, people in King Cove report that it was a mud and rock avalanche on Ram's Creek Road which continued past the house and reached the bay.

According to the City of King Cove, in 2025, there were numerous landslides between Cold Bay and King Cove, as well as on the other side of the bay from King Cove.

The April 1st, 1946, earthquake near Unimak Island (approximately 42 m east of Akutan, 35 miles west of Cold Bay and 45 miles east of King Cove) created a tsunami wave that reached all the way to Antarctica. For years, speculation existed that the large tsunami was aided by a submarine landslide due to the disproportionate waves created by the earthquake. In 1996, the USGS GLORIA discovered numerous slope failures (historic submarine landslides) along the eastern Aleutian Shelf. An exceptionally large failure was found at the location of the now named Ugamak Slide (Fryer, Watts, Patson 2004). The Ugamak Slide consists of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

If the Ugamak Slide did indeed occur on April 1st, 1946, it is likely that much of the seismic motion, especially at longer periods, was from the slide itself. A tectonic shock – a shallow subduction earthquake – was probably the trigger but differentiating it from the rest of the motion may prove impossible. The evidence for a landslide source to the 1946 tsunami is substantial (Fryer, Watts, Patson 2004).

#### H.4.1.6.3 Extent (Magnitude and Severity)

There have been seven (7) recorded landslides and one (1) recorded debris flow in the vicinity of King Cove. The Alaska Landslide Inventory Database provided no additional information outside of deciphering the landslides from the debris flow (DGGS 2026). Subaerial landslides on sloped terrain in the City of King Cove pose a threat to critical facilities or human life.

Based on the Alaska Landslide Inventory Database, it can be estimated that the historical subaerial landslides recorded in Sand Point range in width of less than 100 feet to over 500 feet.

The largest discovered underwater landslide deposit in the Aleutians East Borough is the Ugamak Submarine Slide. The Ugamak Submarine Slide consisted of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

Landslides have been documented near bodies of water in King Cove- these events have the possibility to produce a tsunami or seiche. Ongoing monitoring and modelling of these areas is needed to identify if future subaerial landslides have the potential to trigger a tsunami.

A landslide (both submarine and subaerial) can trigger a tsunami. Due to King Cove's location near the Pacific Ocean, and exposure to the open ocean, a submarine landslide-induced tsunami affecting the Planning Area in the future is a possibility. In the past, submarine landslides created secondary hazards (tsunamis), that have impacted the City of King Cove.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of ground failure in King Cove is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### H.4.1.6.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | There are anecdotal reports from the City of King Cove detailing steep slopes near the roadways to Cold Bay and across the bay. These hillsides were impacted by landslides and are presumably more prone to another slide or an avalanche. |
| Infrastructure | There are anecdotal reports of roadways being damaged by landslides in 2025. The roads leading to Cold Bay, and across the bay from King Cove were covered by landslides. Landslides could impact other roadways in the future and could damage structures near steep slopes. A submarine landslide induced tsunami could damage infrastructure along the coastline as well. Critical facilities at risk of landslide impacts include the Alaska Commercial Company and the Silver Bay Stock Room. |
| People | There are no reports of injuries or fatalities due to landslides in King Cove. Injuries or deaths could be caused by landslides due to tsunami waves or debris and soil/earth burying or hitting individuals with force. |
| Utilities | There are no reports of utility disruptions due to landslides in King Cove. Underground water, sewer, and electric lines could be damaged by earth movement. |
| Transportation | According to the City of King Cove, road travel to Cold Bay, and across the bay from King Cove were impacted by landslides in 2025. This could happen again in the future, as well as air travel being limited by runway surfaces being damaged or covered by landslide debris. A submarine landslide could cause a tsunami and inundate the runway or roadways leading to the airport. |
| Economy | There are no reported impacts to the local economy due to landslides in King Cove. |
| Subsistence Resources | There are no reported landslide impacts on subsistence resources in King Cove. |

#### H.4.1.6.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that King Cove will experience a landslide event in the calendar year. There is a 1 in 5 years chance of occurring (1/5 = 20%), and the history of subaerial landslide events is greater than 10% but less than or equal to 20% per year.

#### H.4.1.6.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of landslides in the future in King Cove. |
| Location | It is possible that future climate conditions will influence the location of future landslides in King Cove. Landslide probability is location specific, and numerous variables must be considered. It is common for debris flows to recur in the same channel or to shift slightly. Other types of landslides may reoccur in the same place or the area directly adjacent to a previous landslide. King Cove is located in a highly |

| Description of Future Conditions | |
|---|---|
| | seismic area, which can trigger landslides at any time, and create areas prone to landslides that did not used to be.<br>Ground failures related to more frequent severe weather events, an increase in atmospheric rivers, and potential droughts are expected to appear in locations that were previously frozen and are now thawing. This includes areas that are immediately adjacent to recently thawed ground and where overlying vegetation has been removed. However, landslides also occur in areas with no prior known instabilities due to changing conditions such as increased rainfall, strong earthquake shaking, and human activities (DHS&EM 2023). |
| Extent (Magnitude and Severity) | It is likely that future climate conditions will influence the magnitude of future landslides in King Cove. Landslides are expected to increase in magnitude with increased areas of effect as severe weather events increase in frequency (IPCC 2019).<br>Future climate conditions are expected to increase landslide frequency of all intensities, and as people develop across the landscape, including into hazardous areas, there will likely be an increase in more significant outcomes in the future (DHS&EM 2023). |
| Impact | It is likely that future climate conditions will influence the impact of future landslides in King Cove. Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from an increase in atmospheric rivers, severe weather events, and glacial decline (IPCC 2019), which could increase future ground failure events and resultant impacts. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of future landslides in King Cove. Although the probability of ground failure is location-specific, it is likely, and increasing, due to a changing climate. Severe weather events such as precipitation and wind are a direct result of atmospheric warming. Atmospheric rivers are becoming increasingly common and increase the intensity and duration of precipitation events at regional and local scales. Landslide events are directly related to high intensity precipitation events, and those are likely to become more common over greater geographic regions of Alaska (DHS&EM 2023). |
| Population Patterns | It is possible future climate conditions will influence population patterns in King Cove. King Cove is experiencing a slight increase in population as an overall trend. Since 2020, the population has increased 0.5% annually, from 757 to 784 (US Census 2026). This may eventually mean more of the resident population living in landslide hazard areas, however an increased growing season due to future climate conditions could lengthen the tourist season. An increase in tourists throughout the year could possibly increase the number of people that are at risk of landslide hazards at any given moment. |
| Land Use Development | It is possible future climate conditions will influence future land use development in King Cove. Limiting development and relocating existing development outside of landslide hazard areas would change the development in these areas. A landslide warning system could require infrastructure development, and more development outside of the landslide zones could increase land use to accommodate displaced residents. It is also possible that land developed in the future, or that has already been developed, may eventually become prone to landslide hazards. |
| Subsistence Resources | It is possible that future climate conditions will result in landslides impacting subsistence resources. Landslides could wipe out land access to certain parts of coastline, berry gathering locations, or trails leading to hunting or fishing grounds. |

### H.4.1.7 Invasive Species

The Agdaagux Tribe of King Cove Planning Team did not select this hazard to be profiled in the MJHMP Update.

### H.4.1.8 Sediment Deterioration and Land Destabilization

#### H.4.1.8.1 Location

Sediment deterioration and land destabilization can occur throughout King Cove, with coastal land destabilization being the biggest concern for the community. Since King Cove is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surges, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.

Riverine sediment deterioration and land destabilization aren't identified as a concern for the community.

While the extent of sediment deterioration and land destabilization in King Cove varies by location, facilities across the bay and the area surrounding the King Cove Road may be increasingly vulnerable to future destabilization.

##### H.4.1.8.1 History

The history of coastal sediment deterioration and land destabilization in King Cove varies by location due to the localized nature of storms in the community. According to a 2007 USACE study, erosion occurs along Gould's Lagoon shoreline and that the roadway connecting the Old Ram and New Ram subdivisions is the most vulnerable.

Additionally, it has been reported that the runway at the King Cove Airport experiences soft conditions, particularly during spring breakup and prolonged periods of heavy rain (AirNav 2026).

Another concern in the community is potential sediment deterioration and land destabilization stemming from construction and operation of the USACE-approved King Cove to Cold Bay Road. Since much of the proposed road travels through protected wetlands, the required use of drainage culverts could lead to sediment deterioration and contribute to land destabilization over time (USFWS 2025).

#### H.4.1.8.2 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of sediment deterioration and land destabilization vary throughout select communities.

In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk. King Cove was categorized in Erosion Group 3, which places it at a lower risk of sediment deterioration and land destabilization according to the study.

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the extent of land destabilization in King Cove is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### H.4.1.8.3 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding King Cove has been damages to shoreline and beaches, particularly along areas exposed to waves and storms.<br>In the community, impacts from destabilization has been documented near on roads near critical facilities like the harbor. |
| Infrastructure | Sediment deterioration and land destabilization impacts in King Cove have been documented near the airport runway. Continued land destabilization could threaten additional community infrastructure and increase mitigation costs. |

| Description of Impact | |
|---|---|
| People | While sediment deterioration and land destabilization can affect residents of King Cove by threatening homes and access to subsistence areas, direct impacts to people in King Cove resulting from land destabilization have been limited. |
| Utilities | There have been no documented impacts to the utilities in King Cove from sediment deterioration and land destabilization events. |
| Transportation | The primary transportation related impacts from a sediment deterioration and land destabilization event in King Cove are damage to roads, boardwalks, and other transportation infrastructure. There have been no reports of land destabilization resulting in substantial disruptions to transportation in King Cove. |
| Economy | There are a substantial number of roads in King Cove that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities. |
| Subsistence Resources | A primary concern related to subsistence resources in King Cove is the loss of subsistence fish camps that have been used for generations, which have the potential to be washed-out or the access restricted during a storm. |

#### H.4.1.8.4 Probability of Future Events

The low-lying geography influences the likelihood of continued sediment deterioration and land destabilization in King Cove.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that King Cove will experience a sediment deterioration and land destabilization event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### H.4.1.8.5 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in King Cove. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in King Cove. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal land destabilization in King Cove (AK DGGS 2026). |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in King Cove. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in King Cove. Projected increases in precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in King Cove. Although the probability for land |

| Description of Future Conditions | |
|---|---|
| | destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |
| Population Patterns | It is possible future climate conditions will influence population patterns in King Cove. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of King Cove entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in King Cove. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in King Cove. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

### H.4.1.9 Severe Weather

#### H.4.1.9.1 Location

All of King Cove is vulnerable to severe weather events.

#### H.4.1.9.2 History

**The Planning Team reported that King Cove experiences some of the most severe winter storms in Alaska because of its location on the Pacific side of the Alaska Peninsula.** The community is frequently affected by powerful North Pacific low-pressure systems that produce hurricane-force winds, heavy snow, freezing rain, blizzard conditions, and coastal flooding. While not every storm is individually named, several major winter storms have significantly affected the community.

The Planning Team provided the following historic winter storm information.

**Table H-1- Historic Winter Storms in King Cove Provided by the City of King Cove Planning Team**

| Date | Event | Impacts |
|---|---|---|
| **January 1971** | Major Aleutian Winter Storm | Hurricane-force winds caused damage to buildings, utilities, and harbor facilities throughout the Alaska Peninsula. |
| **December 1987** | Severe Bering Sea Storm | Winds exceeded 80 mph with heavy snow and coastal flooding. Transportation was disrupted for several days. |
| **November 2004** | Strong North Pacific Storm | High winds, heavy precipitation, and coastal flooding affected the Alaska Peninsula, including King Cove. |
| **November 2011** | Bering Sea Superstorm | Although the worst impacts occurred farther north, King Cove experienced storm-force winds, high surf, and significant marine impacts. |
| **December 2020** | Multiple Gulf of Alaska Storms | High winds, heavy rain, snow, and hazardous marine conditions caused transportation delays and power interruptions across the Alaska Peninsula. |
| **Winter 2023–2024** | Repeated North Pacific Storms | Multiple storms brought strong winds, heavy precipitation, rough seas, and flight cancellations affecting King Cove and surrounding communities. |

The Planning Team reported that a cold snap in January-February 2009 impacted King Cove. King Cove also experienced below-normal temperatures in the winter of 2022-2023, producing dangerous wind chills and hazardous travel conditions. The Planning Team reported that the winter of 2025-2026 was prolonged and cold.

The Planning Team provided the following list of significant snowstorms affecting King Cove.

| Date | Event | Impacts |
|---|---|---|
| **January 2001** | Major Alaska Peninsula Winter Storm | More than 12 inches of snow in about 12 hours fell in parts of the Alaska Peninsula. King Cove experienced hurricane-force wind gusts approaching 135 mph, creating blizzard conditions, transportation disruptions, and structural damage in the region. |
| **December 2007** | Winter Storm | Heavy snow combined with wind gusts of approximately 75 mph damaged roofs and buildings in both King Cove and Cold Bay. |
| **Winter 2020–2021** | Multiple Winter Storms | A series of storms brought periods of heavy snow, blowing snow, high winds, and interruptions to air and marine |

| Date | Event | Impacts |
|---|---|---|
| | | transportation throughout the eastern Aleutians and Alaska Peninsula. |
| **Winter 2023–2024** | Repeated Winter Storms | Several storms produced snowfall, blowing snow, and strong winds, resulting in hazardous travel, flight cancellations, and dangerous marine conditions. |
| **Winter 2025–2026** | Multiple Snow Events | Several snowstorms affected the Alaska Peninsula with periods of accumulating snow and blowing snow that disrupted travel and airport operations. |

#### H.4.1.9.3 Extent (Magnitude and Severity)

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather in King Cove is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### H.4.1.9.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team did not report specific impacts to geography/land related to severe weather in King Cove. |
| Infrastructure | The Planning Team reported that hurricane-force winds in winter 1971 caused damage to buildings and harbor facilities. |
| People | The Planning Team did not report specific personal injury or death related to severe weather in King Cove. |
| Utilities | The Planning Team reported that hurricane-force winds in winter 1971 caused damage to utilities. They reported that multiple storms in the Gulf of Alaska in December 2020 caused power interruptions. In the 1989 cold snap, fuel lines froze and heating systems failed. Some residents were forced to improvise fuel delivery systems to heat their homes. Winter storms have resulted in occasional power outages. |
| Transportation | The Planning Team reported that transportation was disrupted for several days during a November 2004 Pacific storm. They reported marine impacts during a Bering Sea Superstorm in November 2011. Transportation delays were experienced due to storms in December 2020. Flight cancellations and rough seas were reported during repeated North Pacific storms in the winter of 2023-2024. Winter storms have resulted in hazardous travel conditions, airport closures, and marine transportation disruptions. |
| Economy | The Planning Team did not report specific impacts to the local economy related to severe weather in King Cove. |
| Subsistence Resources | The Planning Team reported that salmon berry bushes were impacted by the extremely cold winter in early 2026 in King Cove. |

#### H.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that King Cove will experience a severe weather event (dense fog, extreme cold, heavy rain, heavy snow, or high winds), within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### H.4.1.9.6 Future Climate Conditions

***Note- Specific climate modelling was not available for King Cove. Data for nearby Cold Bay is used as a representation for future conditions in King Cove.***

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in King Cove. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in King Cove. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in King Cove. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in King Cove. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in King Cove. | It is unlikely that future climate conditions will influence the nature of future high wind events in King Cove. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in King Cove. | It is possible that future climate conditions will influence the location of future drought/water supply events in King Cove. | It is unlikely that future climate conditions will influence the location of future extreme cold events in King Cove. | It is unlikely that future climate conditions will influence the location of future heavy rain events in King Cove. | It is unlikely that future climate conditions will influence the location of future heavy snow events in King Cove. | It is unlikely that future climate conditions will influence the location of future high wind events in King Cove. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in King Cove could increase (UAF/SNAP 2025). | In Cold Bay, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026).<br>Climate changes within Alaska are likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In Cold Bay, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in King Cove. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP).<br>Extreme precipitation events have occurred throughout Alaska with increasing frequency.<br>In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>King Cove experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months. Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). |
| Impact | Projected increases in precipitation and associated moisture availability in King Cove could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026).<br>Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in Cold Bay are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities in the Aleutians East Borough (Alaska DHS&EM 2023). | While overall temperature trends in Cold Bay are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In Cold Bay, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+23%) (UAF/SNAP 2026).<br>As precipitation increases, impacts associated with heavy rainfall (localized flooding, landslide potential, roadway washouts, etc.) will increase. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | levels.<br>The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in King Cove by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in Cold Bay are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In Cold Bay, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+23%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in Cold Bay are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In King Cove, winter is likely to have more precipitation (UAF/SNAP 2026).<br>Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in King Cove may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in King Cove have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in King Cove. | Future conditions of drought are not anticipated to significantly affect population patterns in King Cove. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in King Cove. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | It is not likely that future conditions influencing heavy rain will impact changes in King Cove population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in King Cove population patterns. | It is not likely that future conditions influencing high winds will impact changes in King Cove population patterns. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in King Cove. | Future conditions of drought are not anticipated to substantially affect future land use development in King Cove. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in King Cove, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in King Cove population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in King Cove land use development. | It is not likely that future conditions of high winds will impact changes in King Cove population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in King Cove. | Future conditions of drought may affect subsistence resources in King Cove, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | Future conditions of extreme cold may affect subsistence resources in King Cove, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | It is possible that future conditions of heavy rain will impact changes in King Cove land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above King Cove, leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, | It is not likely that future conditions of high winds will impact changes in King Cove land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | development of landslide monitoring equipment and/or landslide barriers/diversion structures. | thermal stress, and nutrient availability for subsistence species. | |

**Projected Conditions for Cold Bay**

In Cold Bay, average annual temperatures may increase by about 9°F by the end of the century.

Winter temperatures are projected to increase the most (+9°F).

Winter may transition from below freezing to above freezing in the future.

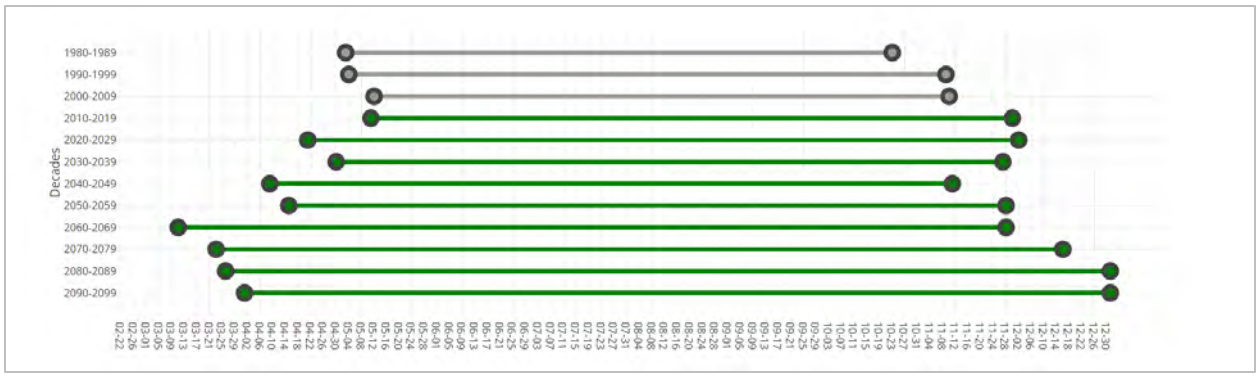
Models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+23%).

In the past, this area had very low flammability. Future flammability may be about the same.

Based on climate and fire-driven shifts, vegetation in this area may be slightly different by the end of the century.

*Source: UAF/SNAP- Northern Climate Reports*

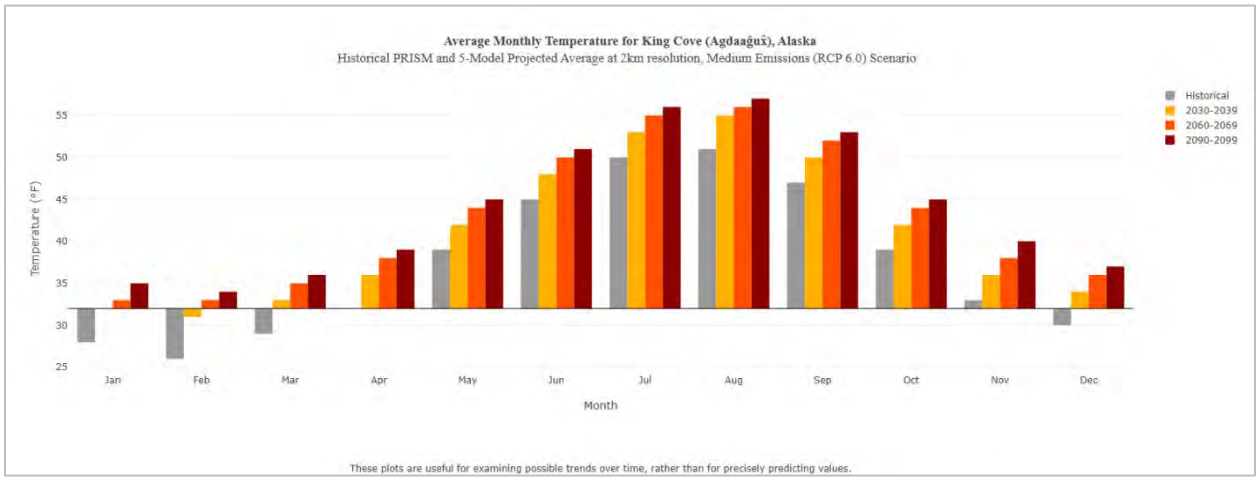
Figure H-10 models historical and future duration of the growing season in King Cove from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure H-10- Historical and Future Projected Changes in Growing Season in King Cove (1980-2099)**

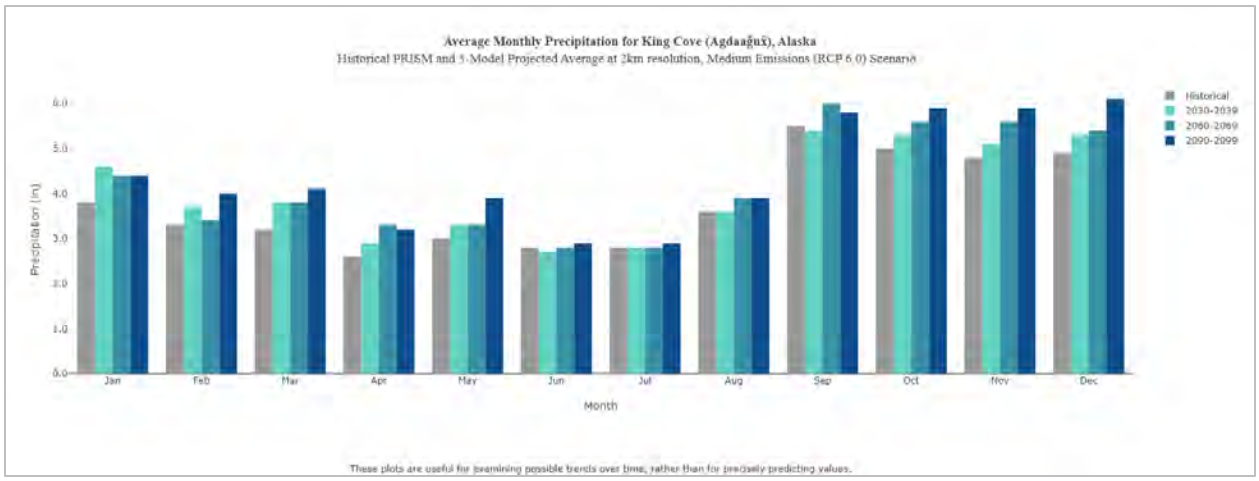
Figure H-11 models historical and future average monthly temperatures in King Cove from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure H-11- Historical and Future Projected Average Monthly Temperature in King Cove (1980-2099)**

Figure H-12 models historical and future average monthly precipitation in King Cove from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure H-12- Historical and Future Projected Average Monthly Precipitation in King Cove (1980-2099)**

### H.4.1.10 Tsunami

#### H.4.1.10.1 Location

Most critical facilities and infrastructure in King Cove are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community (Figure H-13).

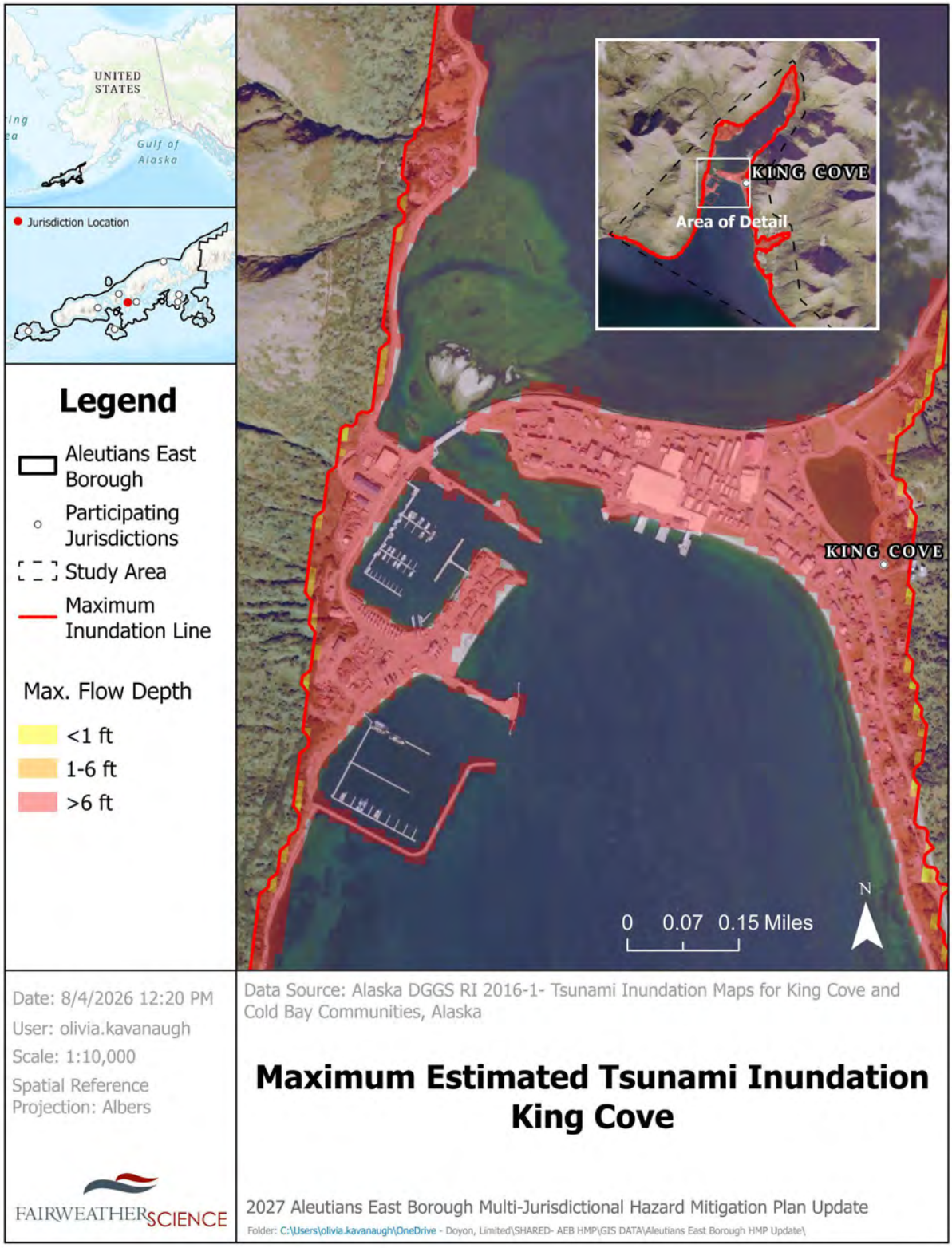



**Figure H-13 - Maximum Estimated Tsunami Inundation in King Cove**

### H.4.1.10.2 History

King Cove is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. See Table 17 in the Base Plan for a comprehensive list from the NOAA National Centers for Environmental Information (NCEI) detailing the earthquake-generated tsunamis with observed or measured waves throughout the Planning Area.

Since 1788, there have been 15 documented tsunami runup events in King Cove. The most recent runup event in Sand Point was recorded in July 2025.

Since 2021, there have been two tsunami warnings issued for King Cove.

- July 29, 2021 (M8.2 Chignik earthquake)
- July 16, 2025 (M7.3 south of Sand Point earthquake)

**Table H-2- Historic Tsunami Runups, King Cove (1788 – 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 15 | 1946-04-01 | KING COVE, AK | EQ + LS | 8.6 | 4.92 |
| 58 | 2006-05-03 | KING COVE, AK | EQ | 8 | 0.23 |
| 61 | 2006-11-15 | KING COVE, AK | EQ | 8.3 | 0.66 |
| 63 | 2009-09-29 | KING COVE, AK | EQ | 8.1 | 0.43 |
| 64 | 2010-02-27 | KING COVE, AK | EQ | 8.8 | 2.07 |
| 68 | 2011-03-11 | KING COVE, AK | EQ | 9.1 | 1.77 |
| 75 | 2014-04-01 | KING COVE, AK | EQ | 8.2 | 0.33 |
| 77 | 2015-09-16 | KING COVE, AK | EQ | 8.3 | 0.85 |
| 81 | 2020-10-19 | KING COVE, AK | EQ | 7.6 | 2.10 |
| 84 | 2021-07-29 | KING COVE, AK | EQ | 8.2 | 0.72 |
| 86 | 2021-08-12 | KING COVE, AK | EQ | 8.1 | 0.62 |
| 88 | 2022-01-15 | KING COVE, AK | VO | N/A | 3.28 |
| 90 | 2023-07-16 | KING COVE, AK | EQ | 7.2 | 0.49 |
| 93 | 2025-07-16 | KING COVE, AK | EQ | 7.3 | 0.26 |
| 95 | 2025-07-29 | KING COVE, AK | EQ | 8.8 | 1.51 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

**April 1946 Aleutian Islands Earthquake and Tsunami**

The 1946 Aleutian Islands earthquake and tsunami struck on April 1, 1946, triggered by a powerful magnitude 8.6 undersea earthquake in the Aleutian Trench off Unimak Island, Alaska, which sent devastating Pacific-wide waves that resulted in a handful of deaths in Alaska and 159 deaths in Hilo, Hawaii.

The tsunami completely obliterated the steel-reinforced concrete Scotch Cap Lighthouse on Unimak Island (in the Aleutians East Borough, approximately 60 miles east of Akutan) and killed all five Coast Guard keepers (National Coast Guard Museum 2024).

Community oral history provided through the City of King Cove adds local context to the documented 1964 tsunami. King Cove elders recalled tsunami-related seawater rising to the community boardwalk following the 1964 Great Alaska Earthquake. While the earthquake-generated tsunami is independently documented, the reported extent of seawater at the boardwalk is retained as community oral history.

Tsunami run-up of nearly 5 feet was recorded in King Cove due to this event.



Source: National Coast Guard Museum 2024

**Figure H-14- Scotch Cap Lighthouse: Before and After the 1946 Tsunami**

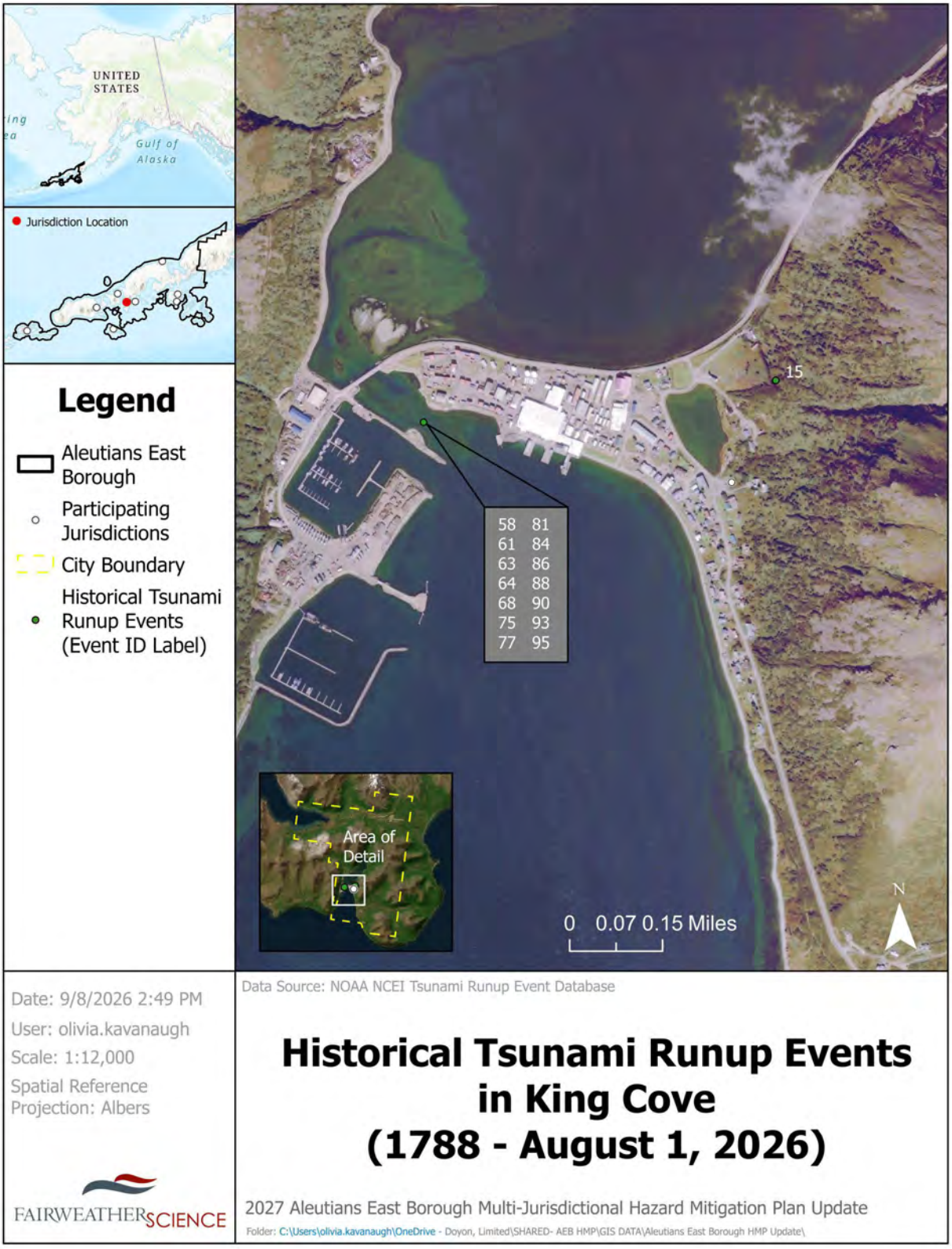



**Figure H-15- Historical Tsunami Runup Events in King Cove (1788 – August 1, 2026)**

#### H.4.1.10.3 Extent (Magnitude and Severity)

King Cove has experienced tsunami run up events from less than 1 foot to nearly 5 feet.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in King Cove is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### H.4.1.10.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | While King Cove is located in a tsunami-prone region, there is little evidence that historical tsunamis have reshaped the community's overall landscape. Changes to the landscape in King Cove from tsunami events tend to be localized as opposed to affecting the entire geography of the area. |
| Infrastructure | While the community hasn't experienced a catastrophic tsunami event impacting infrastructure, King Cove's infrastructure remains highly vulnerable due to many assets being concentrated near sea-level, where a significant tsunami event can severely damage or destroy critical facilities.<br>Critical facilities at risk of tsunami impacts include the Alaska Commercial Company, Teen Center, KC Harbor Warehouse, Silver Bay Stock Room, King Cove City Red Shed, King Cove Bible Church, Cemetery, St. Herman Orthodox Church, King Cove Tribe Culture Center, USPS, Department of Public Safety Building, City Hall, Boat Lift, Port Breakwaters, Small Boat Harbor, T dock, Small Boat Harbor Crane Dock, Large Boat Harbor, Mike Uttecht Jr Harbor House, City Fuel Farm, and King Cove Gas Station. |
| People | There are no documented tsunami-related fatalities or significant injuries in King Cove. Future injuries or fatalities could occur due to drowning or being struck by strong tsunami waves. |
| Utilities | There are no documented reports of historical tsunamis causing significant damage to King Cove's utility infrastructure, including its electrical, water, wastewater, or communications systems. Future tsunamis could damage utility infrastructure, which could result in prolonged service disruptions and outages. |
| Transportation | Historically, there are no documented reports of tsunamis causing significant damage to transportation infrastructure in King Cove. A significant tsunami could inundate some roadways to and from the airport and in an extreme event potentially inundate the runway and airport infrastructure from the south. Aircraft taking off or landing on the water (floatplanes) could be impacted directly by a significant wave causing damage to aircraft and people onboard the aircraft. |
| Economy | There are no recorded economic impacts from tsunamis in King Cove. |
| Subsistence Resources | There have been no recorded instances of a tsunami in King Cove that has impacted the community's access to subsistence resources. |

#### H.4.1.10.5 Probability of Future Events

Based on DGGS inundation mapping, and the criteria identified in Table 6 of the Base Plan, it is **Likely** that King Cove will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### H.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in King Cove is not anticipated to change in the future. |
| Location | The location of tsunami events in King Cove is not anticipated to change in the future. All low-lying coastal areas in King Cove will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in King Cove. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in King Cove. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in King Cove. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in King Cove, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in King Cove could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in King Cove, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in King Cove, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in King Cove. |

### H.4.1.11 Volcano

#### H.4.1.11.1 Location

The entire geography of King Cove is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.

According to the 2023 State of Alaska HMP, King Cove is located in a **moderate** volcanic ash hazard level area (Figure H-16).

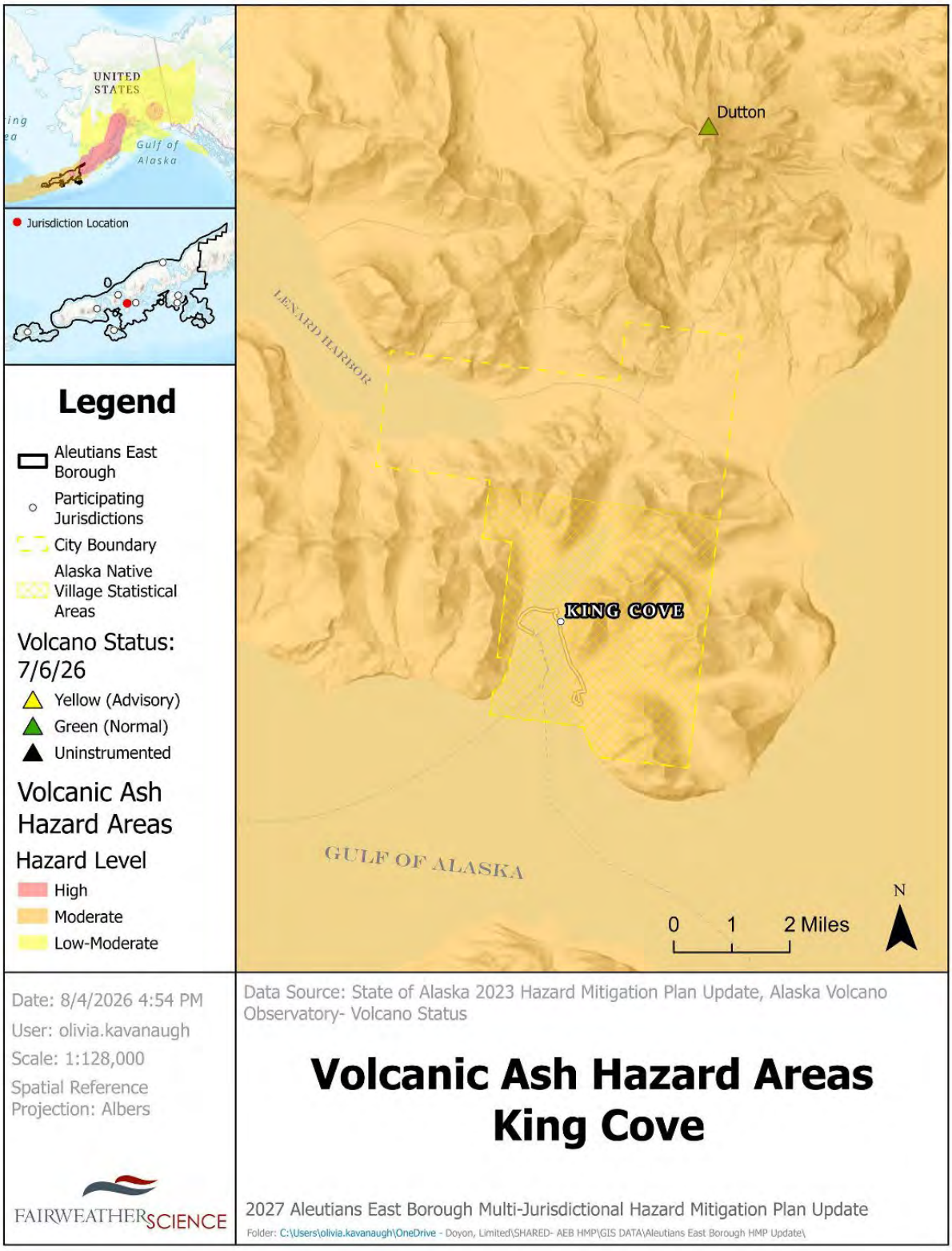



**Figure H-16- King Cove Volcanic Hazard Areas**

#### H.4.1.11.2 History

King Cove has had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to King Cove is **Mount Dutton**, which is approximately 9 miles north of the community. While no volcanic eruption has occurred at Mount Dutton, a 1988 seismic swarm near the volcano resulted in a string of earthquakes being sharply felt at King Cove (AVO 2026).

The volcano that has historically caused the most impacts at King Cove is **Mount Pavlof**. Located approximately 30 miles north of King Cove, Pavlof has erupted a total of 31 times since 1900, with several of them resulting in localized impacts. The eruptions in 1917, 1986, 1996, 2013, and 2014 resulted in light ash fall accumulating in several AEB communities, including King Cove.

**Mount Shishaldin** is a historically active volcano that has resulted in several eruptions that has impacted the AEB, including King Cove. Located approximately 70 miles west of King Cove, Shishaldin has erupted a total of 24 times since 1900. In 2023, it was reported that an eruption from Shishaldin resulted in light ash fall accumulating in King Cove.

#### H.4.1.11.3 Extent (Magnitude and Severity)

King Cove is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, King Cove has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community.

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcanoes in King Cove is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### H.4.1.11.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding King Cove has been ashfall. While most of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposit (USGS 2015). |
| Infrastructure | The historical ashfall reported in King Cove has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of King Cove from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. |
| Utilities | There have been no documented cases of volcanic eruptions causing utility disruptions in King Cove. While wet ash can cause power outages by coating insulators and transformers, the ashfall in the community from past eruptions have only resulted in trace amounts scattered throughout King Cove (USGS 2015). |
| Transportation | The primary transportation related impact from a volcanic eruption in King Cove is aircraft interruptions. Ash clouds from Mount Pavlof's 2016 eruption caused flight delays and cancellations throughout Alaska, including King Cove. |
| Economy | The primary economic related impact from a volcanic eruption in King Cove is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations. |
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in King Cove that has impacted the community's access to subsistence resources. |

#### H.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact King Cove.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 7, it is **Highly Likely** King Cove will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### H.4.1.11.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in King Cove. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in King Cove. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in King Cove. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in King Cove. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in King Cove. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in King Cove. |
| Land Use Development | Future climate conditions are not expected to influence land use development in King Cove. |
| Subsistence Resources | Future climate conditions are not expected to influence King Cove's ability to access subsistence resources. |

### H.4.1.12 Wildland Fire

The Agdaagux Tribe of King Cove Planning Team did not select this hazard to be profiled in the MJHMP Update.

According to LANDFIRE's (Landscape Fire and Resource Management Planning Tools Project) 2025 Alaska Statewide Wildfire Exposure Assessment, the majority of the King Cove Planning Area is located in an area that is **Minimally Exposed to Wildfire Hazard**. The population center of King Cove is located in an area that is Infrequently Exposed to Wildfire Hazard (Figure H-17).

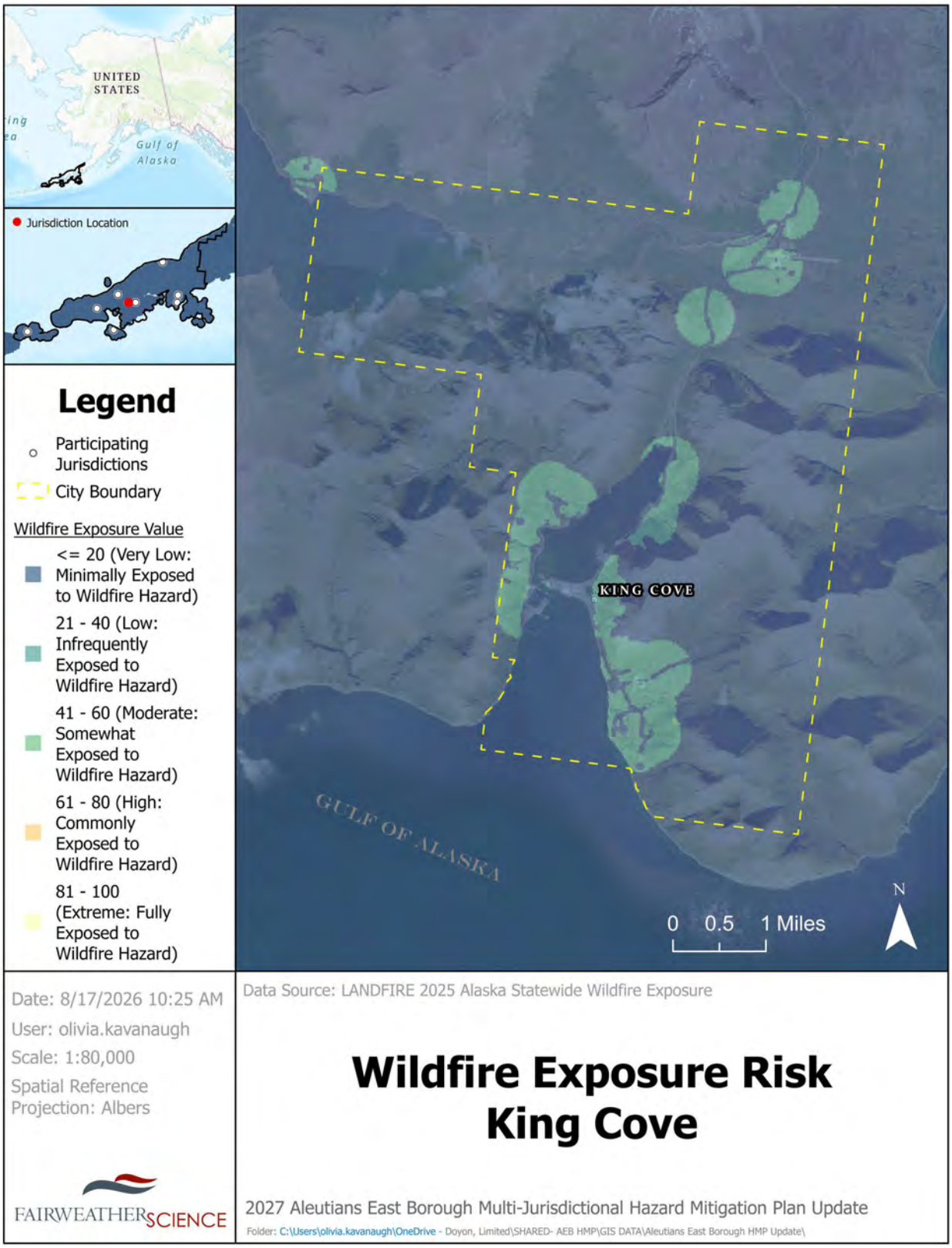



**Figure H-17- King Cove Wildfire Exposure Risk**

## H.4.2 Critical Facilities

**Table H-3- Critical Facilities- Agdaagux Tribe of King Cove**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Agdaagux Tribe of King Cove | Government | 10 | Agdaagux Tribe Tribal Office | 303 Squirrel Rd | 55.040878 | -162.300888 | $300,000 | W2 | Tribal | Tribal | | | x | | x | | x | | x | | | |
| 2 | Agdaagux Tribe of King Cove | Commercial | 20 | Alaska Commercial Company | 401 Harbor Road | 55.05984 | -162.329074 | $5,000,000 | S3 | King Cove Corp | King Cove Corp | | x | x | | x | x | x | x | x | | | |
| 3 | Agdaagux Tribe of King Cove | Commercial | 20 | Teen Center | 122 Ram's Crk Rd | 55.060722 | -162.314583 | $1,221,003 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 4 | Agdaagux Tribe of King Cove | Commercial | 10 | KC Harbor Warehouse (Old Power House) | 407 Harbor Road | 55.060291 | -162.3284 | $1,047,636 | S3 | City | City | | | x | | x | | x | x | x | | | |
| 5 | Agdaagux Tribe of King Cove | Commercial | 10 | Silver Bay Stock room | 402 Harbor Road | 55.059461 | -162.328899 | $500,000 | S3 | King Cove Corp | King Cove Corp | | x | x | | x | x | x | x | x | | | |
| 6 | Agdaagux Tribe of King Cove | Commercial | 0 | King Cove City Red Shed | Park Ave | 55.060394 | -162.313953 | $409,666 | S3 | City | City | | | x | | x | | x | x | x | | | |
| 7 | Agdaagux Tribe of King Cove | Community | 12 | King Cove Bible Church | 107 Ram's Creek Rd | 55.059161 | -162.311105 | $1,200,000 | W2 | Private | Private | | | x | | x | | x | x | x | | | |
| 8 | Agdaagux Tribe of King Cove | Community | 3 | Cemetery | 116 Rams Creek Road | 55.062373 | -162.31174 | $5,000,000 | NA | Unknown | Unknown | | | x | | x | | x | x | x | | | |
| 9 | Agdaagux Tribe of King Cove | Community | 10 | Senior Center | 243 Slocum Dr | 55.047812 | -162.29909 | $2,279,206 | W2 | City | City | | | x | | x | | x | | x | | | |
| 10 | Agdaagux Tribe of King Cove | Community | 30 | The Old School (Multi-Purpose Facility) 43,202 SQFT | 121 Rams Creek Road | 55.047262 | -162.296194 | $2,080,921 | W2 | City | City | | | x | | x | | x | | x | | | |
| 11 | Agdaagux Tribe of King Cove | Community | 5 | St. Herman Orthodox Church | 116 Rams Creek Road | 55.061852 | -162.312397 | $1,000,000 | W2 | Private | Private | | | x | | x | | x | x | x | | | |
| 12 | Agdaagux Tribe of King Cove | Community | 12 | King Cove Tribe Culture Center | 126 Park Ave | 55.059606 | -162.313233 | $1,000,000 | W2 | Non-Profit | Non-Profit | | | x | | x | | x | x | x | | | |
| 13 | Agdaagux Tribe of King Cove | Community | 30 | USPS | 137 Park Avenue | 55.059019 | -162.313318 | $1,000,000 | W2 | King Cove Corp | King Cove Corp | | | x | | x | | x | x | x | | | |
| 14 | Agdaagux Tribe of King Cove | Education | 1000 | King Cove School | 236 Slocum Dr | 55.047366 | -162.296215 | $31,871,802 | S3 | AEB | AEB | | | x | | x | | x | | x | | | |
| 15 | Agdaagux Tribe of King Cove | Emergency Response | 7 | Department of Public Safety 3,402 SQFT | 135 Rams Creek Rd | 55.060689 | -162.314202 | $2,683,653 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 16 | Agdaagux Tribe of King Cove | Government | 6 | Public Works 7,605 SQFT | 339 Ram's Creek Rd | 55.04256 | -162.296767 | $3,623,039 | S3 | City | City | | | x | | x | | x | | x | | | |
| 17 | Agdaagux Tribe of King Cove | Government | 4 | City Hall 1,670 SQFT | 110 Ram's Creek Rd | 55.059522 | -162.311238 | $1,129,471 | W2 | City | City | | | x | | x | | x | x | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | Agdaagux Tribe of King Cove | Medical | 10 | Clinic | 238 Slocum Dr | 55.048487 | -162.295742 | $20,000,000 | W2 | Tribal | Tribal | | | x | | x | | x | | x | | | |
| 19 | Agdaagux Tribe of King Cove | Transportation | 3 | Boat Travel Lift | Harbor Road | 55.057028 | -162.326555 | $1,300,000 | Steel | City | City | | | x | | x | | x | x | x | | | |
| 20 | Agdaagux Tribe of King Cove | Transportation | 0 | Port Breakwaters | King Cove Harbor | 55.053644 | -162.324982 | $50,000,000 | 1.43 miles of stone | City | City | | | x | x | x | | x | x | x | | | |
| 21 | Agdaagux Tribe of King Cove | Transportation | 20 | Small Boat Harbor | Harbor Road | 55.055207 | -162.327803 | $50,000,000 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 22 | Agdaagux Tribe of King Cove | Transportation | 3 | T Dock - Small harbor boat | Harbor Road | 55.05854 | -162.325893 | $50,000,000 | Wood | City | City | | | x | | x | | x | x | x | | | |
| 23 | Agdaagux Tribe of King Cove | Transportation | 3 | Small harbor crane dock | Harbor Road | 55.060092 | -162.326396 | $50,000,000 | Metal | City | City | | | x | x | x | | x | x | x | | | |
| 24 | Agdaagux Tribe of King Cove | Transportation | 20 | Airport Runway | Airport Road | 55.116287 | -162.27618 | $50,000,000 | Gravel path (3,500 x 115 ft) | State | State | | | x | | | | x | | x | | | |
| 25 | Agdaagux Tribe of King Cove | Transportation | 20 | Large Boat Harbor | Harbor Road | 55.055819 | -162.323059 | $13,260,524 | W2 | City | City | | | x | x | x | | x | x | x | | | |
| 26 | Agdaagux Tribe of King Cove | Transportation | 0 | Harbor Bridge | Harbor Rd | 55.060924 | -162.326577 | $10,000,000 | Wood and metal | City | City | | | x | x | x | | x | | x | | | |
| 27 | Agdaagux Tribe of King Cove | Transportation | 0 | Delta Creek Bridge East | AEB Route 1 | 55.121547 | -162.274724 | $10,000,000 | Wood and metal | AEB | AEB | | | x | | | | x | | x | | | |
| 28 | Agdaagux Tribe of King Cove | Transportation | 0 | Waterfall Bridge | Waterfall Creek Rd | 55.125384 | -162.273022 | $10,000,000 | Wood and metal | City | City | | | x | | | | x | | x | | x | |
| 29 | Agdaagux Tribe of King Cove | Transportation | 1 | King Cove DOT | 608 Airport Rd | 55.114457 | -162.274432 | $5,000,000 | S3 | State | State | | | x | | | | x | | x | | | |
| 30 | Agdaagux Tribe of King Cove | Transportation | 3 | Mike Uttecht Jr Harbor House 3,600 SQFT | 407 Harbor Road | 55.056774 | -162.326002 | $1,016,303 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 31 | Agdaagux Tribe of King Cove | Utilities | 3 | City Fuel Farm | Harbor Road | 55.060353 | -162.328916 | $10,000,000 | Steel tanks | City | City | | | x | | x | | x | x | x | | | |
| 32 | Agdaagux Tribe of King Cove | Utilities | 2 | Welcome to King Cove Water Tower | Airport Rd | 55.105446 | -162.2903 | $10,000,000 | Steel Tank | City | City | | | x | | | | x | | x | | | |
| 33 | Agdaagux Tribe of King Cove | Utilities | 3 | Powerhouse | 237 Slocum Dr | 55.04813 | -162.293623 | $8,032,348 | S3 | City | City | | | x | | x | | x | | x | | | |
| 34 | Agdaagux Tribe of King Cove | Utilities | 4 | Clear Creek Dam | Delta Creek Rd | 55.139724 | -162.269935 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35 | Agdaagux Tribe of King Cove | Utilities | 4 | Delta Creek Dam | End of Delta Creek Rd | 55.140096 | -162.272465 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 36 | Agdaagux Tribe of King Cove | Utilities | 3 | Waterfall Creek Dam | Waterfall Drive | 55.114409 | -162.280057 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 37 | Agdaagux Tribe of King Cove | Utilities | 3 | Old Ram's Creek Dam/Water Reservoir | Slocum Dr | 55.057068 | -162.27714 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 38 | Agdaagux Tribe of King Cove | Utilities | 2 | Chlorine House | 205 Hillside Dr | 55.049081 | -162.304219 | $5,000,000 | Concrete | City | City | | | x | | x | | x | | x | | | |
| 39 | Agdaagux Tribe of King Cove | Utilities | 1 | Water Reservoir | Unknown | 55.057074 | -162.277108 | $5,000,000 | Metal Dam | City | City | | | x | | | | x | | x | | | |
| 40 | Agdaagux Tribe of King Cove | Utilities | 3 | Land Field | Salmon Berry Dr | 55.034766 | -162.293527 | $5,000,000 | Gravel | City | City | | | x | | x | | x | | x | | | |
| 41 | Agdaagux Tribe of King Cove | Utilities | 1 | AT&T / Fastwyre | Hillside Dr | 55.049388 | -162.304179 | $5,000,000 | Cell Tower | Private | Private | | | x | | x | | x | | x | | | |
| 42 | Agdaagux Tribe of King Cove | Utilities | 1 | GCI Satellite Station | Rams Creek Road | 55.060816 | -162.314439 | $5,000,000 | Cell Tower | Private | Private | | | x | | x | | x | x | x | | | |
| 43 | Agdaagux Tribe of King Cove | Utilities | 2 | Water Treatment Plant 1,914 SQFT | 605 Delta Crk Rd | 55.123416 | -162.272107 | $1,757,290 | S3 | City | City | | | x | | | | x | | x | | | |
| 44 | Agdaagux Tribe of King Cove | Utilities | 12 | King Cove Gas Sation | Harbor Road | 55.056474 | -162.326894 | $506,060 | Steel Tank | City | City | | | x | | x | | x | x | x | | | |
| 45 | Agdaagux Tribe of King Cove | Utilities | 3 | Hydro Intake House/Clear Creek | Clear Creek | 55.139734 | -162.26987 | $155,708 | S3 | City | City | | | x | | | | x | | x | | x | |
| 46 | Agdaagux Tribe of King Cove | Utilities | 3 | Hydro Intake House/Glacier Creek | Glacier Creek | 55.140012 | -162.27209 | $155,708 | S3 | City | City | | | x | | | | x | | x | | x | |
| **Total Occupants:** | | | **1322** | | | **Total Estimated Value:** | | **$457,530,338** | | | | | | | | | | | | | | | |

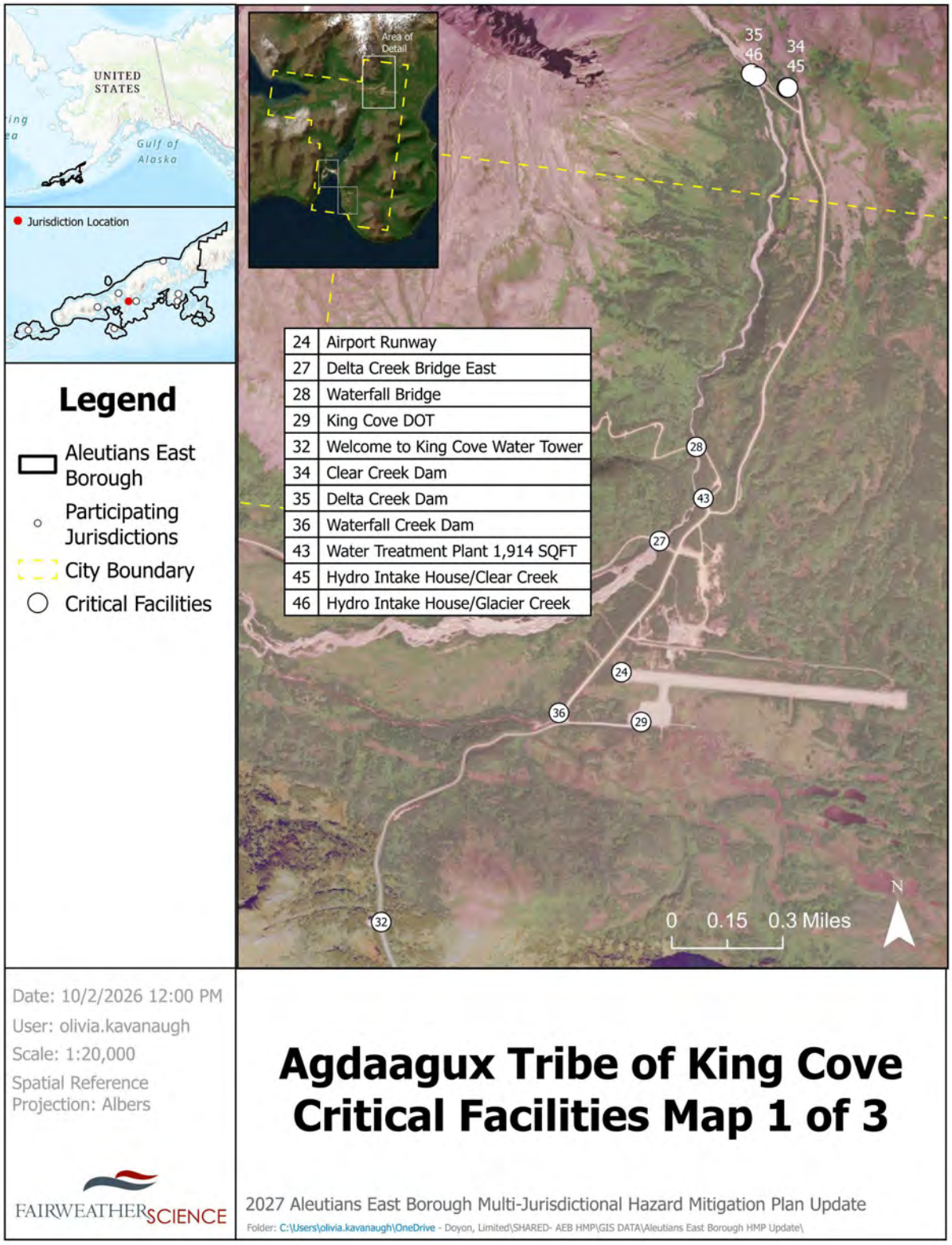



**Figure H-18- Agdaagux Tribe of King Cove Critical Facilities Map 1 of 3**

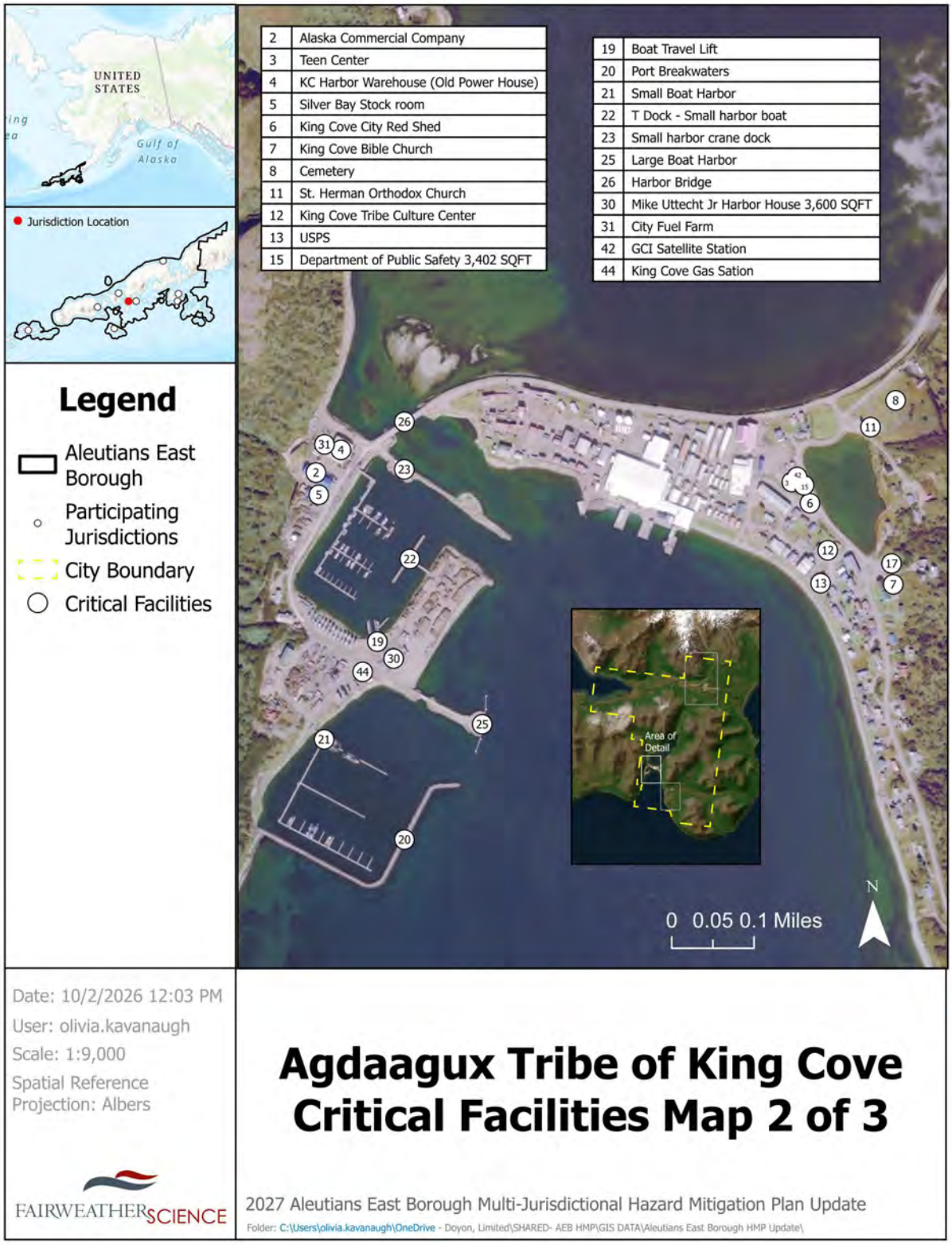



**Figure H-19- Agdaagux Tribe of King Cove Critical Facilities Map 2 of 3**

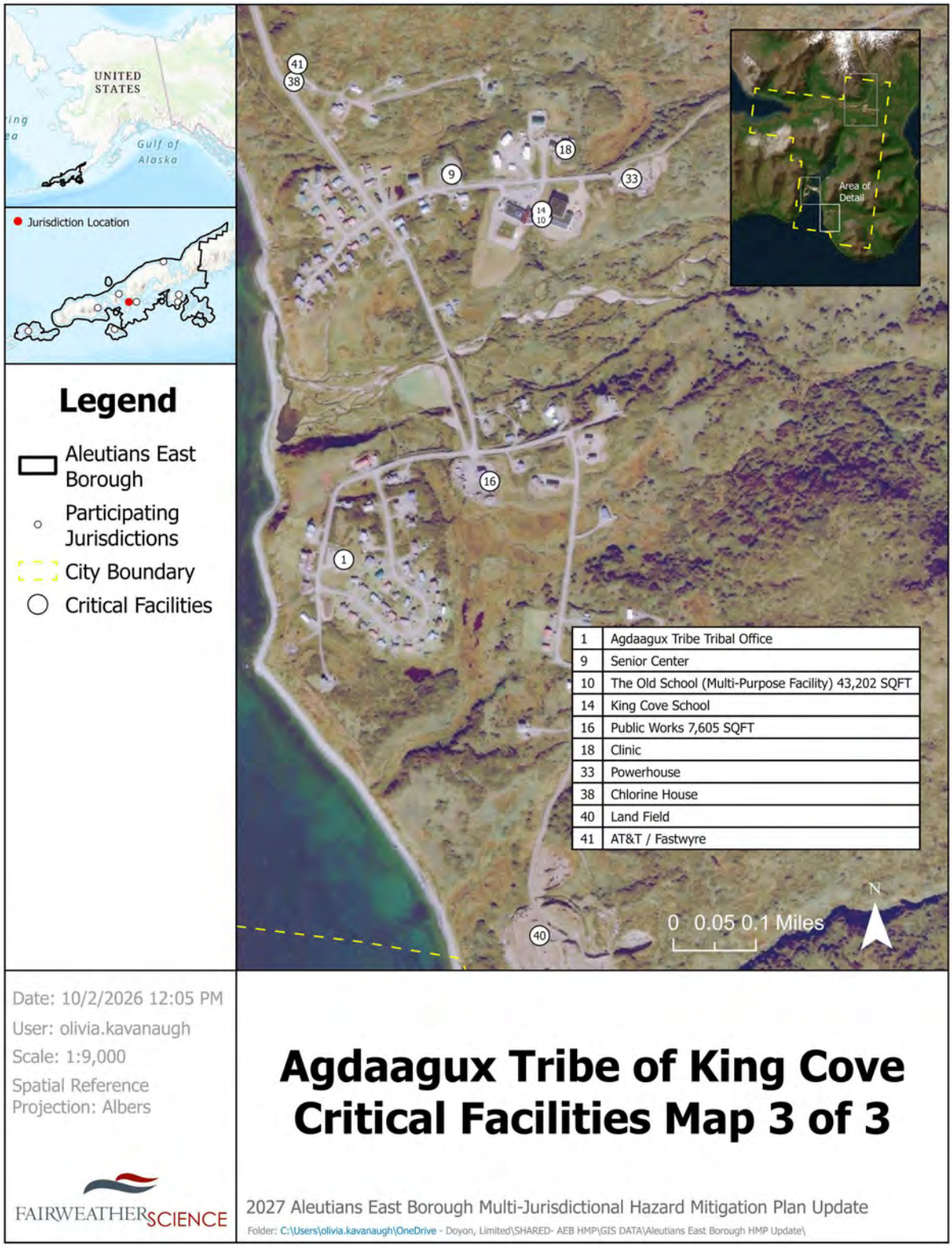



**Figure H-20- Agdaagux Tribe of King Cove Critical Facilities Map 3 of 3**

## H.4.3 Summary of Vulnerability

**Table H-4- Jurisdictional Summary of Vulnerability- Agdaagux Tribe of King Cove**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere-Snow Avalanche | 2 | 30 | $5,500,000 | 8 | 32 | $5,799,104 |
| Earthquake | 46 | 1322 | $457,530,338 | 178 | 736 | $129,345,657 |
| Sediment Deterioration and Land Destabilization | 4 | 23 | $123,260,524 | 8 | 32 | $5,799,104 |
| Flood | 33 | 1276 | $345,461,632 | 178 | 736 | $129,345,657 |
| Ground Failure/ Landslide | 2 | 30 | $5,500,000 | 8 | 32 | $5,799,104 |
| Severe Weather | 46 | 1322 | $457,530,338 | 178 | 736 | $129,345,657 |
| Tsunami | 22 | 201 | $252,274,316 | 70 | 280 | $50,659,632 |
| Volcano | 46 | 1322 | $457,530,338 | 178 | 736 | $129,345,657 |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | 7 | 20 | $30,311,416 | 0 | 0 | $0 |
| Invasive Species | Did not profile this hazard | | | | | |

The Agdaagux Tribe's vulnerability to natural hazards extends beyond potential damage to buildings and infrastructure. Tribal members use lands surrounding King Cove for subsistence and cultural purposes, and subsistence harvesting provides important food resources, including salmon, caribou, geese, and ptarmigan. Hazards that affect access to these areas or the availability of subsistence resources may therefore affect Tribal members even when Tribal facilities are not directly damaged.

## H.5 Capability Assessment

***Note: the Agdaagux Tribe of King Cove does not participate in the National Flood Insurance Program (NFIP).***

| Planning and Regulatory Tools | |
|---|---|
| **Plans** | **Existing?** |
| Comprehensive/ Master Plan | No |
| Capital Improvements Plan | No |
| Economic Development Plan | No |
| Emergency Operations Plan or Small Community Emergency Operations Plan | Yes |
| Transportation Plan | No |
| Housing Plan | No |
| Hazard-specific plans or studies | No |

| Land Use Planning and Ordinances or Practices | |
|---|---|
| **Ordinance/Practice** | **Existing?** |
| Zoning Ordinance | City- Yes, Tribe- No |
| Subdivision Ordinance | City- Yes, Tribe- No |
| Building Codes | No |
| Natural Hazard Specific Ordinance or Practices (Stormwater, Steep Slopes, Wildfire) | No |
| Acquisition of Land for Open Space and Public Recreation Uses | No |
| Maintenance Programs to Reduce Risk, E.G., Tree Trimming, Clearing Drainage Systems | No |
| Other | |

| Administrative and Technical | |
|---|---|
| **Resource** | **Existing?** |
| Tribal Council/ Governing Body | Yes- 7 member board runs Tribe |
| Tribal Chief Executive | No |
| Mitigation Planning Committee | Yes, but not a formal Committee. |
| Business Committees | No |
| Mutual Aid Agreements | No |
| Code Inspector | No |
| Environmental/Natural Resources Specialist | No |

| Administrative and Technical | |
|---|---|
| **Resource** | **Existing?** |
| Emergency Manager | No |
| Community Planner | No |
| Housing Specialist | No |
| Engineer | No |
| Historian/ Cultural Advisor | No |
| Financial or Grants Specialist | No |
| Administrative Staff Person | Yes |
| Other- IGAP Coordinator | No |
| Warning Systems/ Services | Yes- Tsunami siren (owned by the City) |
| Hazard Data/Information | No |
| Grant Writing | No |
| Geographic Information Systems (GIS) Analysis | No |

| Financial | |
|---|---|
| **Resource** | **Existing?** |
| Capital Improvements Project Funding | No |
| Gaming Revenue, Enterprise Revenues | No |
| Fees For Water, Sewer, Gas, or Electric Services | No |
| Fees From Festivals, Campsites, and Recreational Areas | No |
| Permits and Other Fees | No |
| Federal Funding (BIA, HUD) | Yes- Get federal funds to run Tribe |
| Contract Services | No |

| Education and Outreach | |
|---|---|
| **Program/Organization** | **Existing?** |
| Gatherings, Festivals, Celebrations and/or Meetings | Yes- Annual meeting |
| Natural Disaster or Safety- Related School Programs | No |
| Fire Safety Programs | No |

Subsistence sharing may also function as a community resilience capability. A regional subsistence study documented an intercommunity sharing relationship in which residents of False Pass received clams shared from King Cove when local clam availability was reduced. This example demonstrates how resource-sharing relationships can help maintain access to subsistence foods when a resource is less available in another community.

# H.6 Mitigation Strategy

## H.6.1 Mitigation Goals

The Agdaagux Tribe of King Cove has identified its goals related to hazard mitigation as:

1. Protect critical infrastructure and community facilities from natural hazards.
2. Strengthen emergency communications and warning systems.

## H.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

This is the first edition HMP for the Agdaagux Tribe of King Cove.

As such, there is no previous HMP and no previously identified mitigation actions for the jurisdiction to provide a status update.

Future plan updates will document the status and progress of mitigation actions identified in this HMP.

## H.6.3 2027 Mitigation Action Plan

**Table H-5- 2027 Mitigation Action Plan- Agdaagux Tribe of King Cove**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | All Hazard | Install generator at tribal building (heavy duty) and fuel supply for extended utility disconnect during catastrophic event | H | Tribal President | FEMA HMA; FEMA HMGP; USDA RD; USDA RUS; Denali Commission; AK DHS&EM; ANTHC | Structure and Infrastructure Projects | Tribal Building | 0-2 years | B/C: This project would provide backup power to the Tribal building and help maintain essential services during extended utility outages following a catastrophic event.<br>TF: This project is technically feasible using a commercially available heavy-duty generator and fuel storage system, with appropriate installation and routine maintenance. | SCERP/EOP; Continuity of Operations Plan; Facilities Management Plan; Capital Improvement Plan; Water System/Utility Plan |
| **2** | Avalanche | Support Mapping of avalanche hazard zones to educate and inform Tribal members that may have residences on those zones. | M | Tribal President | FEMA HMA; FEMA HMGP; USGS; AK DGGS; AK DHS&EM; Denali Commission | Plans and Regulations | All | 0-2 years | B/C: This project would improve public understanding of avalanche hazards and help Tribal members make informed decisions about residences located in or near hazard zones.<br>TF: This project is technically feasible using available mapping methods and technical assistance from State agencies. | SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Comprehensive Plan; Land Use Plan |
| **3** | Dam Failure | Collaborate with City to map potential inundation areas of Clear Creek Dam and Delta Creek Dam to better understand where to focus future dam failure mitigation actions | L | Tribal President | FEMA HHPD; FEMA HMA; FEMA HMGP; USACE; AK DNR; AK DHS&EM | Plans and Regulations | Clear Creek Dam, Delta Creek Dam, Critical Facilities in potential inundation areas | 5-10 years | B/C: This project would identify areas potentially affected by dam failure and help focus future mitigation efforts on vulnerable people, infrastructure, and facilities.<br>TF: This project is technically feasible through coordination between the Tribe and City using available mapping data and technical assistance from State and Federal agencies. | SCERP/EOP; Dam Safety Plan; Emergency Response Plan; Comprehensive Plan; Capital Improvement Plan |
| **4** | Earthquake | Establish earthquake event exercises for school | H | Tribal President | FEMA EMPG; FEMA HMA; AK DHS&EM; AK DEED; School District | Education and Awareness Programs | School | 0-2 years | B/C: This project would improve earthquake preparedness among students and staff by providing an opportunity to practice appropriate response actions.<br>TF: This project is technically feasible using school facilities, established emergency exercise procedures, and emergency management guidance. | SCERP/EOP; Emergency Preparedness Plan; School Emergency Operations Plan; School Facilities Plan; Comprehensive Plan |
| **5** | Earthquake | Educate community on when to secure heavy objects (reference FEMA and State material) and provide materials to secure objects | M | Tribal President | FEMA HMA; FEMA EMPG; FEMA HMGP; AK DHS&EM; AK Earthquake Center/UAF | Education and Awareness Programs | All | 3-4 years | B/C: This project would reduce the potential for injuries and property damage by encouraging residents to secure heavy objects before an earthquake.<br>TF: This project is technically feasible using FEMA and State guidance and readily available securing materials. | SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Comprehensive Plan |
| **6** | Earthquake/Tsunami | Establish emergency food supply at tribal building/new emergency food storage | H | Tribal President | USDA RD; FEMA HMA; FEMA HMGP; Denali Commission; ANTHC | Other | Tribal Building | 0-2 years | B/C: This project would provide emergency food supplies to support Tribal members during an earthquake or | SCERP/EOP; Emergency Preparedness Plan; Continuity of Operations Plan; Capital |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | building in event of earthquake or tsunami that isolates them from other side of town | | | | | | | tsunami that disrupts transportation or isolates portions of the community.<br>TF: This project is technically feasible through construction or use of an appropriate storage facility and establishment of procedures for food storage, rotation, and distribution. | Improvement Plan; Emergency Response Plan |
| **7** | Flood | Coordinate with City, Borough, and State to improve roadside drainage to flood-prone roadways such as W Lagoon Rd and other roads that are susceptible to coastal flooding | H | Tribal President | FEMA HMA; FEMA HMGP; FEMA FMA; FHWA PROTECT; AK DOT&PF; USACE; AK DEC; Denali Commission | Structure and Infrastructure Projects | Roads, culverts, flood protection infrastructure | 0-2 years | B/C: Improving roadside drainage would reduce localized flooding and help maintain access along roads vulnerable to coastal flooding.<br>TF: This project is technically feasible using established engineering practices and coordination with City, Borough, and State agencies. | SCERP/EOP; Transportation Plan; Stormwater/Drainage Plan; Capital Improvement Plan; Comprehensive Plan |
| **8** | Ground Failure/Landslide | Have DGGS conduct landslide hazard analysis and determine if monitoring equipment is necessary or additional mitigation projects to protect specific infrastructure is needed | H | Tribal President | USGS; FEMA HMA; FEMA HMGP; AK DGGS; AK DHS&EM; USACE; Denali Commission | Plans and Regulations | All | 0-2 years | B/C: This project would identify landslide hazards and help determine where monitoring or additional mitigation measures could reduce risks to people and critical infrastructure.<br>TF: This project is technically feasible through technical assistance from DGGS and established landslide assessment methods. | SCERP/EOP; Comprehensive Plan; Land Use Plan; Capital Improvement Plan; Environmental Plan |
| **9** | Sediment Deterioration and Land Destabilization | Support City of establishment of permanent monitoring station at Gould's Lagoon shoreline. | M | Tribal President | NOAA; USGS; FEMA HMA; FEMA HMGP; AK DGGS; AK DHS&EM; USACE; Denali Commission | Structure and Infrastructure Projects | Monitoring equipment, shoreline infrastructure | 5-10 years | B/C: A permanent shoreline monitoring station would provide ongoing information on coastal changes and help identify emerging hazards that may affect Tribal lands and infrastructure.<br>TF: This project is technically feasible using established monitoring technology but may require coordination with the City, outside technical support, installation, and ongoing maintenance. | SCERP/EOP; Comprehensive Plan; Land Use Plan; Environmental Plan; Capital Improvement Plan |
| **10** | Sediment Deterioration and Land Destabilization | Supporting the set-up video and time-lapse destabilization monitoring of King Cove side of new road. | M | Tribal President | FEMA HMA; FEMA HMGP; USGS; AK DGGS; AK DOT&PF; NOAA; Denali Commission | Plans and Regulations | Monitoring equipment, shoreline infrastructure | 5-10 years | B/C: Video and time-lapse monitoring would improve understanding of land destabilization along the new road and help identify changes that may threaten transportation infrastructure.<br>TF: This project is technically feasible using commercially available monitoring equipment, with routine maintenance and data review required. | SCERP/EOP; Transportation Plan; Capital Improvement Plan; Comprehensive Plan |
| **11** | Severe Weather | Retrofit critical facilities to withstand high wind events (Wind shutters) | H | Tribal President | FEMA HMA; FEMA HMGP; USDA RD; Denali Commission; AK DHS&EM; ANTHC | Structure and Infrastructure Projects | All | 0-2 years | B/C: This project would reduce potential damage to critical facilities from high wind events and help maintain essential services following a severe storm.<br>TF: This project is technically feasible using commercially available wind shutters and established building protection methods. | SCERP/EOP; Continuity of Operations Plan; Facilities Management Plan; Capital Improvement Plan; Comprehensive Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **12** | Tsunami | Conduct tsunami vulnerability assessment on facilities located in the inundation zone | H | Tribal President | FEMA HMA; FEMA HMGP; NOAA NTHMP; AK DGGS; AK DHS&EM; USACE; Denali Commission | Plans and Regulations | Critical Facilities in tsunami inundation zone | 0-2 years | B/C: This project would identify facilities vulnerable to tsunami inundation and help prioritize future mitigation measures to reduce potential damage and service disruptions.<br>TF: This project is technically feasible using existing tsunami inundation maps, facility information, and technical assistance. | SCERP/EOP; Tsunami/Emergency Evacuation Plan; Emergency Preparedness Plan; Comprehensive Plan; Capital Improvement Plan; Facilities Management Plan |
| **13** | Volcano | Education to public about what to do during ashfall (vehicles, health, pets) | M | Tribal President | FEMA EMPG; FEMA HMA; USGS/AVO; AK DHS&EM; AK DEC; AK DHSS; ANTHC | Education and Awareness Programs | All | 0-2 years | B/C: Public education on ashfall preparedness would help residents protect their health, vehicles, pets, and property during an ashfall event.<br>TF: This project is technically feasible using established public outreach methods and State and Federal guidance. | SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Comprehensive Plan |

### H.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Provide dam safety information through various mediums (website, social media) | Dams are not owned by the Tribe. Not a current priority. Tribe will support City efforts. |
| Conduct an inventory of high occupancy buildings and critical facilities that need seismic retrofitting | Not a current priority. |
| Bring the DHS&EM "Quake Cottage" to King Cove for earthquake simulation and education | Not a current priority. |
| Prohibit removal of vegetation in landslide areas | Not a current priority. |
| Install warning signs in landslide prone areas | Not a current priority. |
| Incorporate severe weather warnings into Nixie or other community notification systems | Not a current priority. |
| Conduct coastal flood assessment to identify flood-prone areas and vulnerable facilities | Not a current priority. |
| Establish a community flood water monitoring program to collect high water marks and other flood metrics | Not a current priority. |
| Conduct a community wide costal land destabilization assessment | Not a current priority. |
| Evaluate tsunami exposure of critical utility and communications infrastructure and implement feasible measures to protect vulnerable equipment and maintain essential services following a tsunami. | Not a current priority. |
| Develop an ashfall response and cleanup plan | Not a current priority. |
| Develop and implement volcanic ashfall contingency procedures for the King Cove Airport to reduce disruption to aviation operations and support safe inspection, cleanup, closure, and reopening following ashfall events. | Not a current priority. |
| Obtain funding to create airplane mitigation "kit" to protect planes and airport operations during ashfall (plastic covering for engines, equipment to remove ash on planes, etc.) | Not a current priority. |

# H.7 Plan Update

## H.7.1 Changes in Development, including in Hazard-Prone Areas (current and future)

### H.7.1.1 Changes in Development Since 2021

There has been little development in King Cove between 2021 and 2026, and the City's overall vulnerability to natural hazards has not significantly changed. In January 2024, Peter Pan closed their seafood processing plant in King Cove, which was the company's largest processing plant.

### H.7.1.2 Future/Planned Development

Future development in King Cove includes construction of the King Cove to Cold Bay Road, a major transportation project that will provide a roadway connection to the Cold Bay Airport and improve access to regional services and emergency transportation.

This planned development is not anticipated to substantially increase or decrease King Cove's overall vulnerability to natural hazards; however, erosion is a potential concern associated with development and road construction. Disturbance of soils and vegetation, changes in drainage patterns, and increased runoff could contribute to localized erosion, particularly in areas susceptible to coastal or stormwater-related erosion.

## H.7.2 Changes in Priorities and Mitigation Efforts

As this is the Agdaagux Tribe of King Cove's first HMP, there are no previous mitigation priorities or efforts against which to identify changes.

The priorities and mitigation efforts established in this HMP represent the jurisdiction's initial approach to hazard mitigation. Future plan updates will document changes in priorities and mitigation efforts based on changes in hazard conditions, community needs, capabilities, and implementation progress.

# H.8 Plan Maintenance

## H.8.1 Planning Team MJHMP Maintenance Commitment

Agdaagux Tribe of King Cove is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.7.

Agdaagux Tribe of King Cove is committed to annually reviewing the Plan and Tribal staff will work to complete their review responsibilities.

## H.8.2 Continued Public Involvement

Agdaagux Tribe of King Cove is dedicated to continued public involvement over the next five years.

Agdaagux Tribe of King Cove will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2032.

Future engagement should also provide opportunities for Tribal citizens and other community knowledge holders to identify new local observations, environmental changes, subsistence-related impacts, traditional access concerns, and other knowledge relevant to hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where Indigenous Knowledge or other community-provided information is considered for incorporation into the MJHMP, appropriate attention should be given to Tribal review, attribution, sensitivity, and preferences regarding public disclosure.

## H.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

Agdaagux Tribe of King Cove jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The Tribal Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### H.8.3.1.1 Implementing

Upon adoption of the Plan, Agdaagux Tribe of King Cove will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The Borough will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### H.8.3.1.2 Monitoring

Agdaagux Tribe of King Cove will monitor the progress of mitigation actions on an annual basis. The Tribal Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### H.8.3.1.3 Evaluating

Agdaagux Tribe of King Cove will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

#### H.8.3.1.4 Updating

Agdaagux Tribe of King Cove will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.7. The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Future plan updates should provide opportunities for the Agdaagux Tribe to identify local knowledge, subsistence practices, resource-sharing relationships, and other community-based systems that contribute to hazard preparedness and resilience, while allowing the Tribe to determine what information is appropriate for inclusion in the public plan.

Figure H-21 provides a visual of the HMP plan maintenance activities per year.

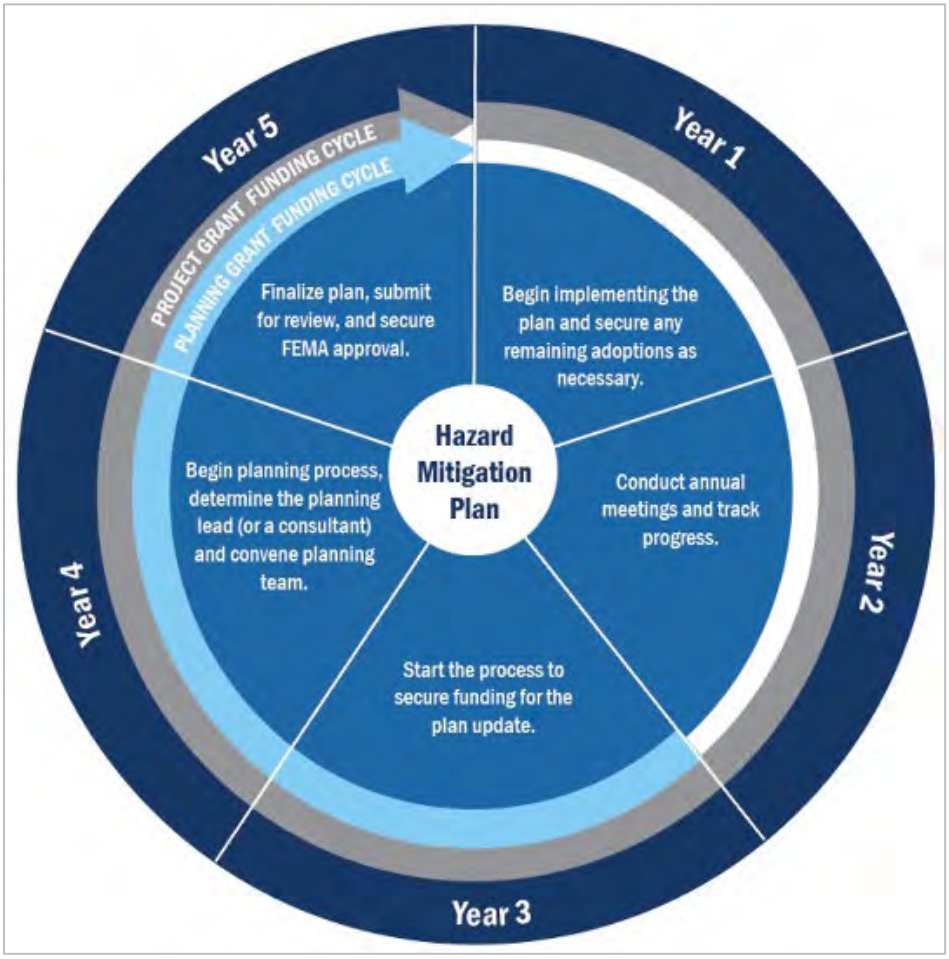



**Figure H-21- HMP Update Schedule**

## H.8.4 Plan Integration

Agdaagux Tribe of King Cove will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other Tribal planning and implementation processes, when appropriate, including other FEMA programs and initiatives.

The Tribe will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the Tribe's comprehensive and land use planning processes, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects as well as the upcoming APIA Regional Adaptation Plan.

As the plan is implemented, Agdaagux Tribe of King Cove will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## H.9 Plan Adoption

The Agdaagux Tribal Council formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

### H.9.1 Tribal Assurances

Agdaagux Tribe of King Cove assures that the Tribal Planning Team and Tribal Council will comply with applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding (including 2 CFR Parts 200 and 3002) and will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes.

[insert signed adoption resolution]

# I. Native Village of Belkofski

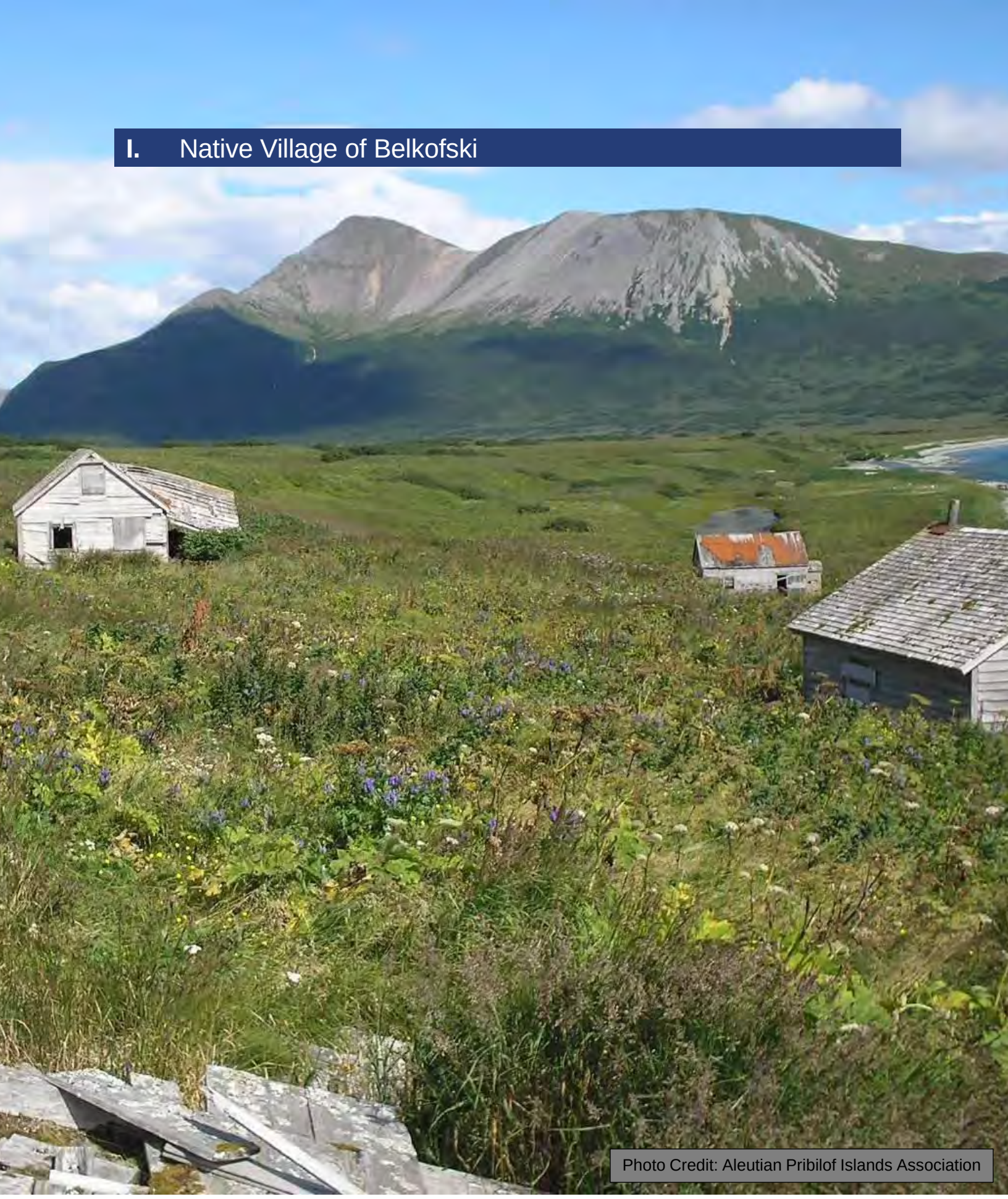


Photo Credit: Aleutian Pribilof Islands Association

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# I.1 Planning Team and Tribal Definition of Public

## I.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Lynn Farr** | Council President |
| **Delores Kochuten** | Council Vice-President |
| **Chris Babcock** | AEBDS Member |
| **Chris Lewis** | Public Works |
| **Eric Siweck** | Police Chief |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

## I.1.2 Tribal Definition of Membership and Public

The Native Village of Belkofski defines Tribal membership eligibility based on descents from Belkofski Village, possession of a Certificate of Indian Blood, and a birth certificate.

For this planning process, the Native Village of Belkofski defines the “public” as enrolled Tribal citizens, residents of King Cove, local businesses and employers, partner governments and organizations, and other individuals with knowledge of or an interest in hazards affecting the community. All community residents may complete surveys and comment on drafts, while the Tribal Council retains authority to adopt the plan for the Tribe.

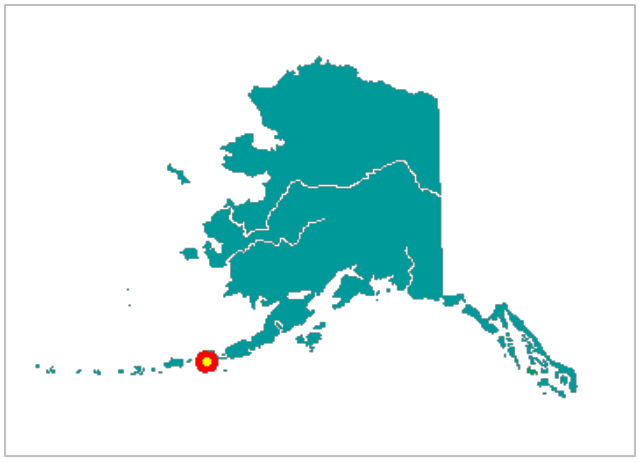
This definition ensures that anyone who lives or works within the community, as well as enrolled Tribal Members residing outside the community, is eligible to attend and participate in the public involvement portion of the HMP Update planning process.

# I.2 Community Profile

## I.2.1 Location and Geography

Belkofski is located at the eastern end of the Alaska Peninsula, 12 miles southeast of King Cove. The area encompasses 2.4 sq miles of land and .9 sq miles of water. Located within the southwest maritime climate zone, Belkofski is characterized by persistently overcast skies, high winds, and frequent cyclonic storms.

## I.2.2 History



Belkofski was established by the Russian-American Company in 1823 as a settlement for Unangax̂ people relocated from the surrounding region to harvest the large concentrations of sea otters found along the area's reefs. During the height of the sea-otter trade, Belkofski became one of the most prosperous villages in the region. By the 1880s, the community had three stores, and residents imported building materials and furnishings from San Francisco. The Holy Resurrection Russian Orthodox Church was also constructed during this period. As the sea-otter industry declined around the turn of the 20th century, so too did Belkofski's population. Residents increasingly relied on trapping and other subsistence activities, while opportunities for wage employment in the Pribilof Islands, King Cove, and Sand Point encouraged families to leave the village. By the early 1980s, the remaining Belkofski residents had relocated to King Cove, bringing the church's bell and icons with them and establishing a new Russian Orthodox church in King Cove.

Although the historic village no longer has a permanent population, it remains an active part of the Tribe's cultural and subsistence geography. The Native Village of Belkofski identifies continuing traditional, cultural, spiritual, and subsistence connections to the ancestral village area, where community members and their ancestors have fished, hunted, gathered berries, and conducted other subsistence activities over generations.

## I.2.3 Population

Belkofski has no year-round resident population, as the last full-time residents relocated to King Cove in the 1980s. According to the 2024 ACS Census, the population of King Cove was 1,352.

## I.2.4 Demographics

The tribal demographics of the Native Village of Belkofski are majority Alaska Native but not enough data exists to determine the demographics of tribal members of two or more races.

For the whole geography of King Cove, demographics are a mix of non-Native and Unangan residents. According to the 2020 census data, 327 residents identified as Alaska Native or American Indian, 213 identified as White, 109 identified as Asian, 29 identified as some Other Race, 10 identified as Black or African American, 6 identified as Native Hawaiian and Other Pacific Islander, and 63 identified as two or more races, with 48 of those residents identifying as White and Alaska Native or American Indian.

## I.2.5 Economy

King Cove's economy depends almost completely on the year-round commercial fishing and seafood processing industries. While the closure of the Peter Pan processing facility significantly impacted the community's economy, several smaller processing facilities are still in operation. Sixty-two residents hold commercial fishing permits. Subsistence harvesting also provides important food resources, including

salmon, caribou, geese, and ptarmigan, supplementing household food supplies and helping offset household food costs.

### I.2.6 Land Use

Due to the provisions of the ANCSA, the regional and village native corporations received title to property in their traditional lands. The Belkofski Corporation holds title to significant surface lands while The Aleut Corporation holds title to the subsurface resources.

King Cove is defined by commercial and industrial infrastructure related to the fishing industry, with a small concentration of land dedicated to residential buildings. The undeveloped land surrounding King Cove is primarily Alaska Native Land, owned by the King Cove Corporation.

## I.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following jurisdictional-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **1968 King Cove Alaska Comprehensive Development Plan** | Establish a long-term framework for King Cove's land use, transportation, infrastructure, and community development. | Used to identify infrastructure and land use planning for the HMP Update. |
| **1981 City of King Cove Alaska Comprehensive Plan** | Evaluate population, land use, housing, transportation, utilities, and community facilities to guide future community expansion. | Used to identify hazard areas, infrastructure and land use planning for the HMP Update. |
| **2003 City of King Cove Waterfront Utilities Plan** | Assess waterfront utility needs and identify infrastructure improvements to support future waterfront and harbor development. | Used to identify hazard areas, infrastructure and utility use planning for the HMP Update. |
| **2006 Comprehensive Community Plan** | Assess existing conditions and establish goals, policies, and land-use priorities for King Cove's future growth and development. | Used to identify hazard areas, infrastructure and land use planning for the HMP Update. |
| **2007 USACE Erosion Information Paper- King Cove** | Baseline erosion assessment of the community. | Used to describe historical erosion locations, rates, and impacts in the communities where reports were available. |
| **2010 & 2021 Aleutians East Borough MJHMP** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **2016 Tsunami Inundation Maps for King Cove and Cold Bay Communities, Alaska** | Identify potential tsunami hazards for the geographies and model the extent of tsunami waves generated earthquake and landslide events. | Referenced data in Tsunami hazard profile/annex. Used inundation maps as the data source for potential losses due to tsunami event. |

Source: State of Alaska Community Plans Library, E.N. Suleimani, D.J. Nicolsky, R.D. Koehler, J.T. Freymueller, and A.E. Macpherson 2016

# I.4 Risk Assessment

## I.4.1 Hazards

This Risk Assessment assesses risk to both the Historical Belkofski Village geography as well as King Cove, where the majority of Tribal Members live.

**The Native Village of Belkofski Planning Team identified the following natural hazards that may impact the Historical Belkofski Village.**

- ✓ Hazard profiled for this jurisdiction in the MJHMP Update
- X Hazard not profiled for this jurisdiction in the MJHMP Update

- X Changes in the Cryosphere- Sea Ice
- ✓ Changes in the Cryosphere- Snow Avalanche
- X Dam Failure
- ✓ Earthquake
- ✓ Flood
- ✓ Ground Failure/Landslide
- ✓ Invasive Species
- ✓ Sediment Deterioration and Land Destabilization
- ✓ Severe Weather
- ✓ Tsunami
- ✓ Volcano
- X Wildland Fire

| Historical Belkofski Village | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| Cryosphere- Sea Ice | Did not profile this hazard. | | |
| Cryosphere- Snow Avalanche | 2- Possible | 4- Catastrophic | Belkofski Village is vulnerable to avalanches due to its steep and rugged mountainous terrain, heavy snowfall, strong winds, and rapidly changing winter weather conditions. Avalanches can occur on steep slopes and may be triggered by heavy snowfall, wind loading, rain, warming temperatures, or seismic activity.<br>As there are no year-round residents in Belkofski Village and the Village is primarily used as a subsistence area in the summer, historical avalanche areas surrounding Belkofski Village are not well documented. |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and Belkofski Village itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 2- Possible | 2- Limited | Sediment deterioration and land destabilization can occur throughout Belkofski Village, with coastal land destabilization being the biggest concern for the area. Since Belkofski is in a coastal location, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline. |

| Historical Belkofski Village | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| | | | Riverine land destabilization isn't identified as a concern for the area. |
| Flood | 3- Likely | 2- Limited | While flooding is identified as a major concern, historical flood event information in Belkofski Village is limited.<br>Due to the absence of major rivers, riverine flooding is not considered a significant hazard, according to the Planning Team. Historical flooding has generally been limited to localized inundation of low-lying coastal areas during severe North Pacific storms. |
| Ground Failure/ Landslide | 2- Possible | 2- Limited | Belkofski Village is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity. |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of Belkofski Village is susceptible to severe weather events and impacts.<br>The area is frequently affected by powerful North Pacific low-pressure systems that produce hurricane-force winds, heavy snow, freezing rain, blizzard conditions, and coastal flooding. |
| Tsunami | 3- Likely | 4- Catastrophic | Belkofski Village is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. Most critical facilities in Belkofski Village are vulnerable to effects from tsunamis, due to the estimated tsunami hazard area encompassing most of the critical facilities in the area. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of Belkofski Village is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.<br>Volcanic ashfall is the primary volcanic hazard that may impact Belkofski Village.<br>Belkofski Village is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). |
| Wildland Fire | Did not profile this hazard. | | |
| Dam Failure | Did not profile this hazard. | | |
| Invasive Species | 2- Possible | 2- Limited | While the entire natural area surrounding Belkofski Village is vulnerable to the spread of invasive species, there is no recorded data that displays the historical occurrences in the area. Belkofski Village's close proximity to King Cove's busy coastal port is the primary human-caused pathway in the spread of invasive species in the area. |

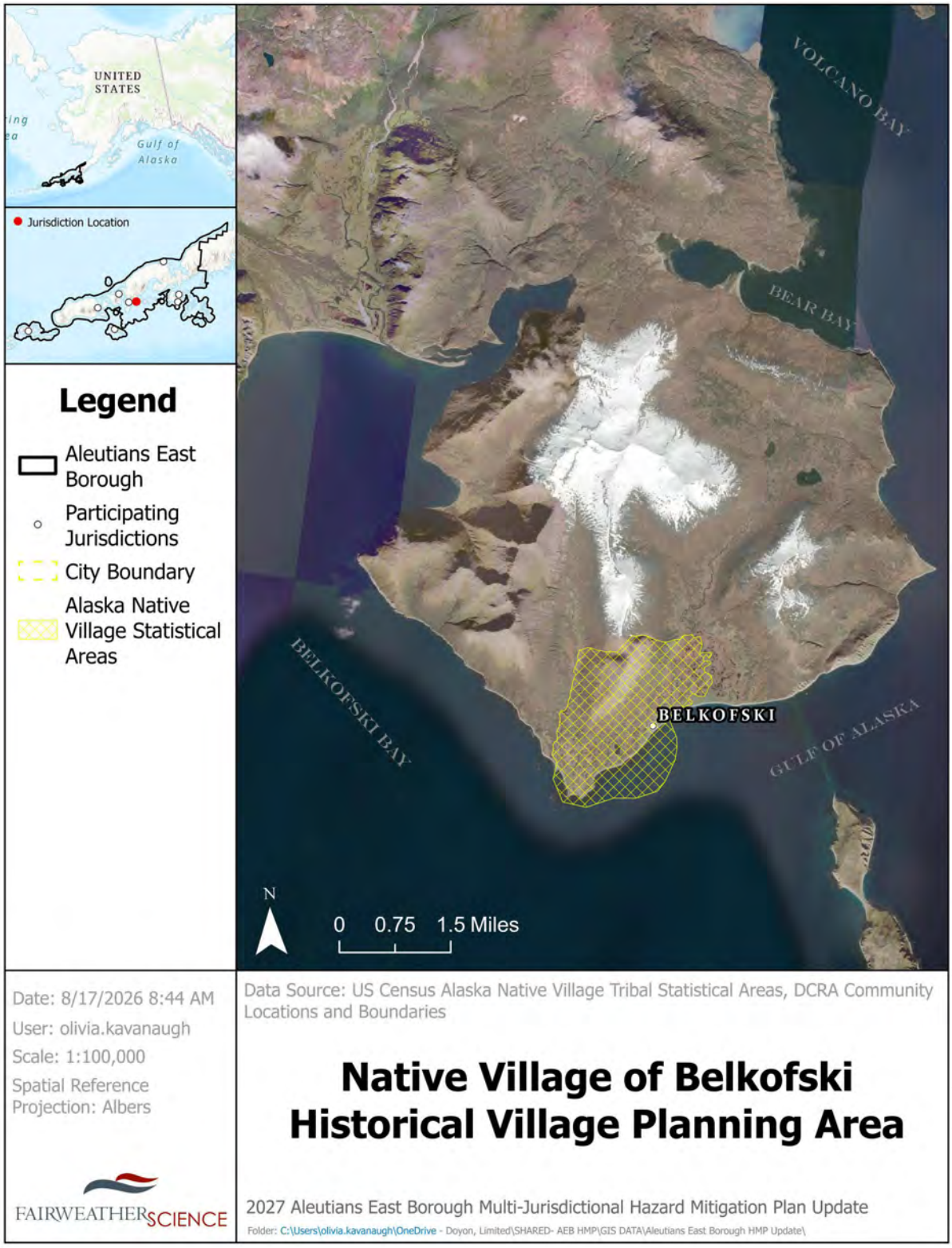



**Figure I-1- Native Village of Belkofski Planning Area- Historical Belkofski Village**

**The Native Village of Belkofski Planning Team identified the following natural hazards that may impact their assets and Tribal members in King Cove.**

✓ Hazard profiled for this jurisdiction in the MJHMP Update
X Hazard not profiled for this jurisdiction in the MJHMP Update

X Changes in the Cryosphere- Sea Ice
✓ Changes in the Cryosphere- Snow Avalanche
✓ Dam Failure
✓ Earthquake
✓ Flood
✓ Ground Failure/Landslide
✓ Invasive Species
X Sediment Deterioration and Land Destabilization
✓ Severe Weather
✓ Tsunami
✓ Volcano
X Wildland Fire

| King Cove Geography | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| Cryosphere- Sea Ice | Did not profile this hazard. | | |
| Cryosphere- Snow Avalanche | 2- Possible | 4- Catastrophic | King Cove is vulnerable to avalanches due to its steep and rugged mountainous terrain, heavy snowfall, strong winds, and rapidly changing winter weather conditions. Avalanches can occur on steep slopes and may be triggered by heavy snowfall, wind loading, rain, warming temperatures, or seismic activity.<br>The 2021 Aleutians East Borough Hazard Mitigation Plan identifies three avalanche-prone areas in and around King Cove.<br>The Planning Team reported an avalanche on February 1, 2012. This avalanche reportedly struck the Alaska Commercial (AC) Store. |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and King Cove itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 2- Possible | 2- Limited | Sediment deterioration and land destabilization can occur throughout King Cove, with coastal land destabilization being the biggest concern for the community. Since King Cove is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.<br>Riverine land destabilization isn't identified as a concern for the community.<br>According to a 2007 USACE study, erosion occurs along Gould's Lagoon shoreline and that the roadway connecting the Old Ram and New Ram subdivisions is the most vulnerable. |

| King Cove Geography | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| Flood | 3- Likely | 2- Limited | According to the Aleutians East Borough Planning Team, W Lagoon Rd in King Cove experiences annual flooding related to the King Tide. During the 2025 event, flooding cut off a portion of W Lagoon Rd, which resulted in 30-40 people unable to access or leave their homes.<br>Due to the absence of major rivers, riverine flooding is not considered a significant hazard, according to the Planning Team. Historical flooding has generally been limited to localized inundation of low-lying coastal areas, harbor facilities, and roadways during severe North Pacific storms. |
| Ground Failure/ Landslide | 2- Possible | 4- Catastrophic | King Cove is prone to landslides due to its steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity. |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of King Cove is susceptible to severe weather events and impacts.<br>The Planning Team reported that King Cove experiences some of the most severe winter storms in Alaska because of its location on the Pacific side of the Alaska Peninsula. The community is frequently affected by powerful North Pacific low-pressure systems that produce hurricane-force winds, heavy snow, freezing rain, blizzard conditions, and coastal flooding. |
| Tsunami | 3- Likely | 4- Catastrophic | King Cove is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. Most critical facilities and infrastructure in King Cove are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community. |
| Volcano | 3- Likely | 3- Critical | The entire geography of King Cove is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.<br>Volcanic ashfall is the primary volcanic hazard that may impact King Cove.<br>King Cove is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, King Cove has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community. |
| Wildland Fire | Did not profile this hazard. | | |
| Dam Failure | 2- Possible | 3- Critical | There are four dams in King Cove, all owned by the City. The two proposed High hazard dams in King Cove are the Clear Creek Dam and Delta Creek Dam. Two other dams, Old Rams |

| King Cove Geography | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| | | | Creek Dam and Waterfall Creek Dam, have an unknown hazard classification. |
| Invasive Species | Did not profile this hazard. | | |




**Figure I-2- Native Village of Belkofski Planning Area- King Cove**

#### I.4.1.1 Changes in the Cryosphere- Sea Ice

The Native Village of Belkofski Planning Team did not select this hazard to be profiled in the MJHMP Update for Belkofski Village or their King Cove geography.

### I.4.1.2 Changes in the Cryosphere- Snow Avalanche

#### I.4.1.2.1 Location

As there are no year-round residents in Belkofski Village and the Village is primarily used as a subsistence area in the summer, historical avalanche areas surrounding Belkofski Village are not well documented.

Figure I-3 estimates avalanche hazard areas in Belkofski Village.

As avalanche hazard areas are not well defined in the community and detailed terrain data, such as LiDAR, were not available, ArcGIS Pro basemaps, including satellite imagery, topographic maps, and terrain data, were used to identify mountainous areas, elevation, and observable slope characteristics.

Potential avalanche hazard areas were manually delineated based on these features. Where available, photographs of the surrounding geography were also reviewed to confirm the presence of steep slopes and other terrain characteristics indicative of potential avalanche hazard.

***This assessment is intended to identify potential areas of avalanche hazard at a planning level. It is not a substitute for site-specific avalanche hazard mapping, geotechnical investigations, or detailed evaluation of local topography, snow conditions, and site-specific conditions. Areas identified through this assessment should be considered preliminary and should be subject to further investigation where development or other activities may be exposed to avalanche hazards.***

Figure I-4 identifies three known avalanche-prone areas in and around King Cove.

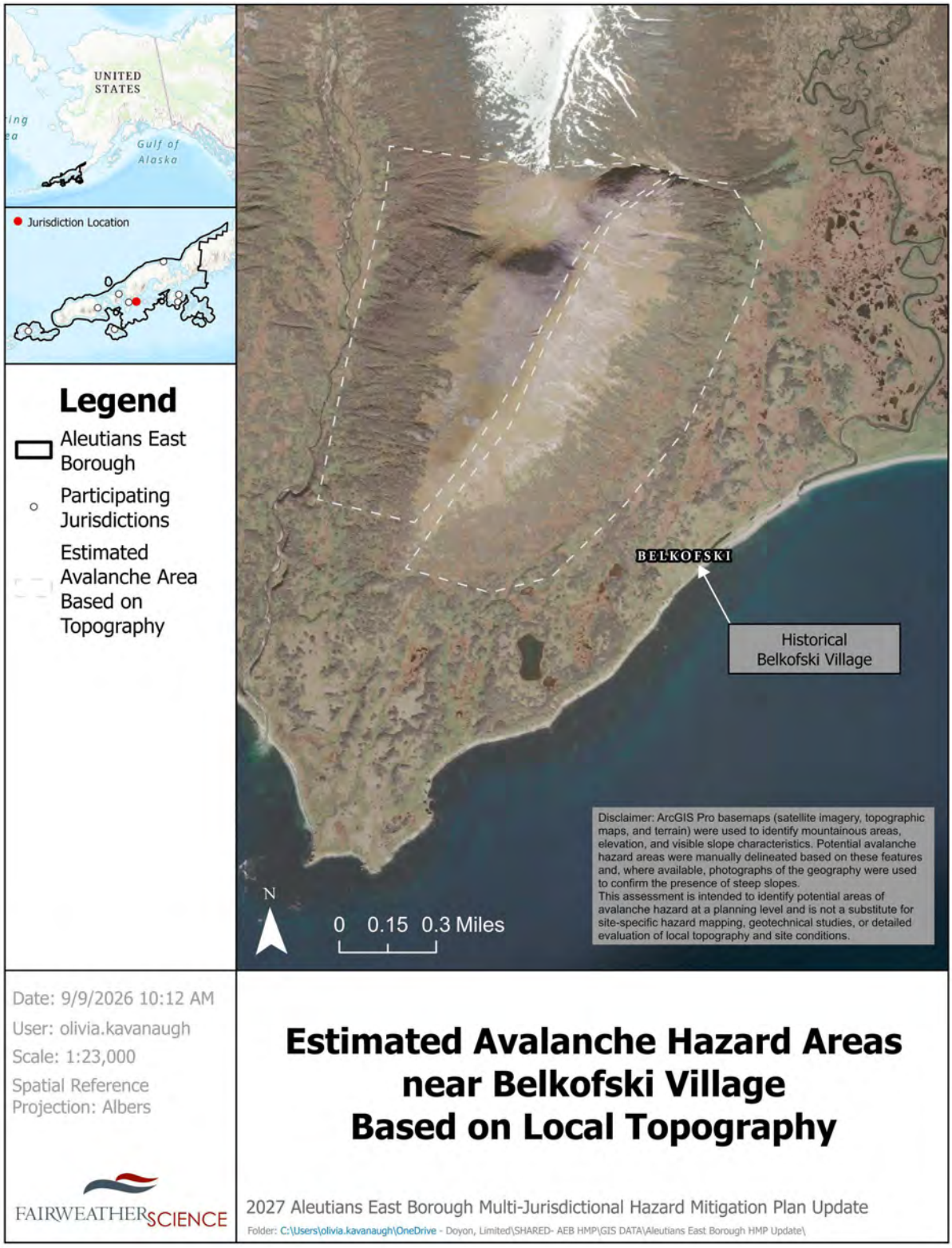



**Figure I-3- Estimated Avalanche Hazard Areas near Belkofski Village**

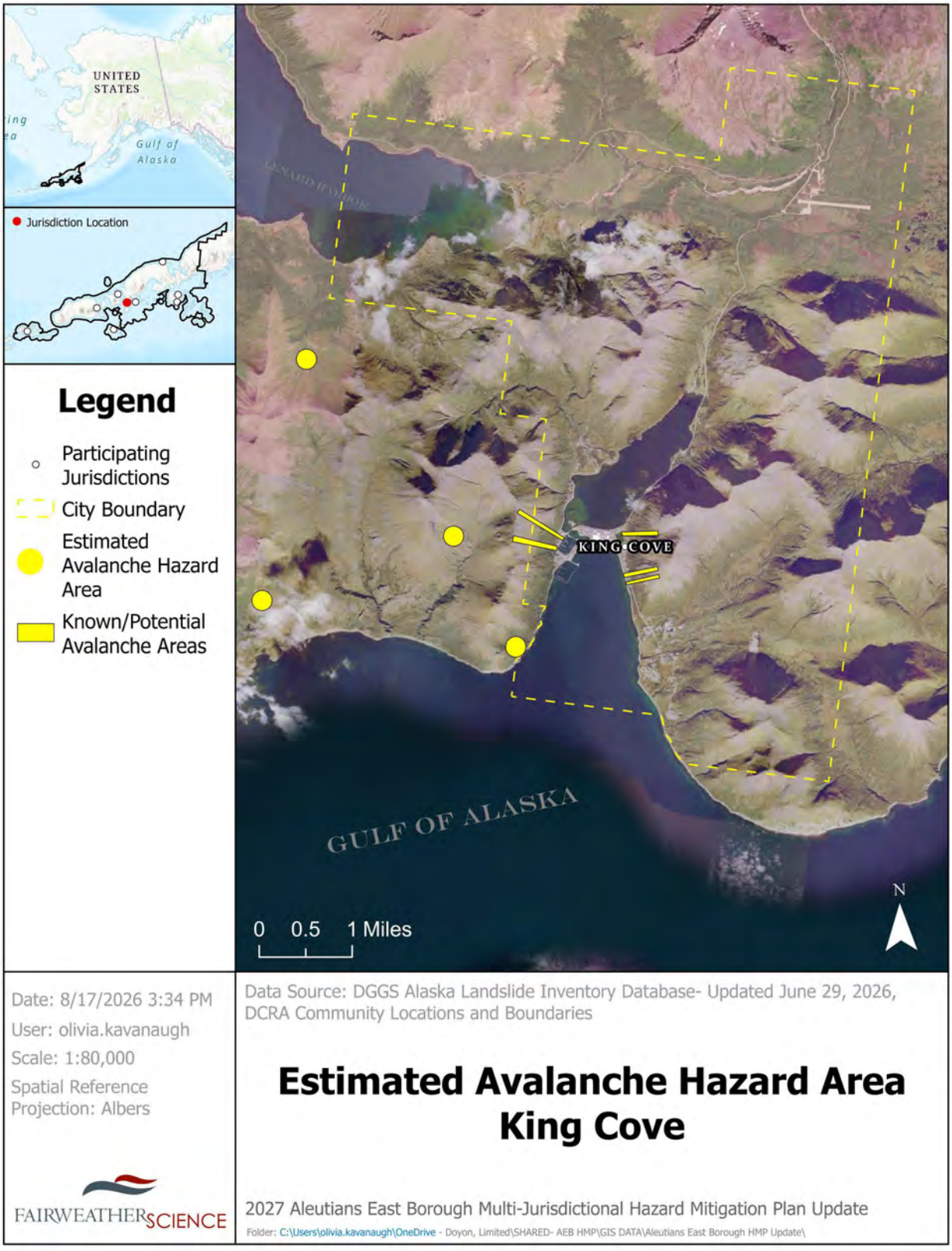



**Figure I-4- King Cove Avalanche Hazard Areas**

#### I.4.1.2.2 History

There is no documented history of avalanches affecting Belkofski Village.

In 2021, King Cove residents stated that an avalanche occurred over 50 years ago and carried a house down the slope to the beach. An *Anchorage Daily Times* article of 1960 describes an event in which a dwelling in King Cove was flattened by strong winds during a snow storm at approximately 10 p.m. on January 19, 1960. Five young children and one adult died during this event. In the article, their deaths are attributed to exposure while pinned under the wreckage of their home, which was blown over by winds of about 60 knots. The temperature was reported to be 18 degrees F at the time. While the news report cites wind as the cause of the damage, people in King Cove report that it was a mud and rock avalanche on Ram's Creek Road which continued past the house and reached the bay. More recently, there has been at least one snow avalanche there.

The Planning Team reported an avalanche on February 1, 2012. This avalanche reportedly struck the Alaska Commercial (AC) Store. An article from the Bristol Bay Times by Hannah Heimbuch, dated March 9, 2012, described this impact on the community:

*AC Store Manager, Jeff Watt, said he and several other employees typically would have been there at the time-around 7:50 p.m. on February 1-but weather had prompted him to send everyone home early just 20 minutes before. When the crew arrived early the next morning, they noticed a few inches of water on the sales floor, leaking from broken pipes. The scene in the warehouse was more severe, with a snow slide taking up a large part of the room, 12 to 14 feet at its deepest level. The store stocks large appliances like washers, dryers and refrigerators, and of the 12 units stored in the warehouse, only two survived intact. 'It tossed one about 30 feet before it ran into something else,' Watt said. With such a heavy appliance getting tossed around like a basketball, Watt and his employees were fortunate to be on their way home when the snow hit. It took several bobcats and 20 people several days to get the snow cleared from the warehouse and clearing damaged merchandise and taking inventory took employees another two weeks.*

*This has been a particularly undecided winter on the peninsula and in King Cove, with seriously fluctuating temperatures and high snowfall, which makes for an unstable snow pack. This was one of several avalanches that occurred over the span of a few days-albeit one of the most destructive seen in years. 'They've had a couple of avalanches at this store before,' Watt said, 'But it's opened the door a couple of feet. (This) probably came into my building a couple of hundred feet.*

There have been no documented avalanches in King Cove during the last five years (2021-2026). However, avalanche hazard remains a recognized risk for the community because of the steep mountains immediately above portions of the town.

#### I.4.1.2.3 Extent (Magnitude and Severity)

Based on the lack of history of past snow avalanche events surrounding Belkofski Village and the criteria identified in Table 5 of the Base Plan, the extent of snow avalanche **in Belkofski Village** is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

King Cove has experienced at least one documented damaging avalanche in recent history when an avalanche struck the Alaska Commercial (AC) Store on February 1, 2012. Community members also report a historic avalanche more than 50 years ago that destroyed a residence. Although no recent avalanche incidents have occurred, continued development near steep slopes, changing winter weather patterns, and increased rain-on-snow events support maintaining avalanche hazards as a planning concern.

Based on the extent of past snow avalanche events and the criteria identified in Table 5 of the Base Plan, the extent of snow avalanche **in King Cove** is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### I.4.1.2.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team does not report any specific previous impacts to geography/land from snow avalanches in Belkofski Village or King Cove. |
| Infrastructure | The Planning Team does not report any specific previous impacts to infrastructure from snow avalanches in Belkofski Village.<br>The 2012 reported avalanche event damaged the Alaska Commercial (AC) store, including water damage from broken and leaking pipes. The Planning Team reports that there have been no other damage from snow avalanches to homes, business, or public facilities in King Cove. |
| People | The Planning Team does not report any specific previous impacts to people from snow avalanches in Belkofski Village.<br>On January 19, 1960, a winter storm event with a reported avalanche resulted in the deaths of six people, who reportedly died from exposure after being pinned in their houses. The Planning Team reports that there have been no other injuries or fatalities from avalanches in King Cove. |
| Utilities | There are no utilities in Belkofski Village and thus; have not been impacted from snow avalanches in Belkofski Village.<br>The Planning Team does not report any specific previous impacts to utilities from snow avalanches in King Cove. |
| Transportation | The Planning Team does not report any specific previous impacts to transportation from snow avalanches in Belkofski Village.<br>The Planning Team does not report any specific previous impacts to transportation from snow avalanches in King Cove. |
| Economy | The Planning Team does not report any specific previous economic impacts from snow avalanches in Belkofski Village.<br>The Planning Team does not report any specific previous economic impacts due to snow avalanches in King Cove. |
| Subsistence Resources | The Planning Team does not report any specific previous impacts to subsistence resources from snow avalanches in Belkofski Village.<br>The Planning Team does not report any specific previous impacts to subsistence resources from snow avalanches in King Cove. |

#### I.4.1.2.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that **Belkofski Village** will experience a snow avalanche event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that **King Cove** will experience a snow avalanche event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### I.4.1.2.6 Future Climate Conditions

This information is applicable to Belkofski Village as well as King Cove.

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of snow avalanche hazards in Alaska. |
| Location | It is possible future climate conditions will influence the location of snow avalanche hazards in Alaska. As warmer, wetter winters become more prevalent, heavy-snow avalanches may occur on different slopes that have not historically experienced avalanches. |
| Extent | Future climate conditions are likely to influence the magnitude and severity of avalanches. Avalanche activity is determined by several factors, including snowpack type, internal liquid volume, air temperature, precipitation, elevation, slope, ground cover, etc. An increase in liquid content within snowpack, from increased December-March air temperature and January-February increased precipitation, may lead to greater occurrence of wet snow avalanches, especially in late winter/early spring (Ballesteros-Canovas et al. 2018). |
| Impact | Future climate conditions are likely to influence the impact of avalanches. As snowpack experiences greater liquid volume, avalanche risk will increase (Ballesteros-Canovas et al. 2018). As snowpack retreats to higher elevations due to reduced snowpack and quickened melt, the impacted area will also shift upwards. Impacts in this scenario will likely be due to loss of water supply, affecting culture, wildlife resources, and tourism (IPCC 2018). Infrastructure in avalanche hazard zones may also be impacted by an increase in frequency and extent of wet snow avalanches. Damage to structures may vary depending on the impact pressure of the avalanches. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of future avalanche events in the Aleutians East Borough Planning Area. Some studies suggest that a warming climate may increase avalanche risk due to changes in snow accumulation and moisture content, as well as loss of snowpack stability because of changing air temperature (DGGS 2023d). Ballesteros-Canovas et al. (2018) predicts an increase in avalanche activity in the 2nd half of the 21st century; largely wet-snow avalanches due to increased air temperature and precipitation. |
| Population Patterns | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in the Aleutians East Borough Planning Area. However, this is jurisdiction dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history of avalanches causing damage to community infrastructure, may result in construction moving outside of avalanche zones. Due to the cost and difficulty of building in the Aleutian Islands, it is possible that if a home is damaged by an avalanche that the residents may move out of the community completely. |
| Land Use Development | Future climate conditions are not anticipated to influence population patterns as they relate to avalanche hazards, because most avalanche-prone areas are located outside of populated areas in the Aleutians East Borough Planning Area. However, this is jurisdiction dependent. An increase in frequency or extent of avalanches caused by future conditions in a community like King Cove, which has a documented history |

| Description of Future Conditions | |
|---|---|
| | of avalanches causing damage to community infrastructure, may result in land use which promotes development outside of possible avalanche slide paths. |
| Subsistence Resources | Future climate conditions are not anticipated to influence subsistence resources as they relate to avalanche hazards. |

### I.4.1.3 Dam Failure

There are no dams located near the Historical Belkofski Village that may impact the Village. Dam failure risk is only assessed for the King Cove geography.

#### I.4.1.3.1 Location

There are four dams in King Cove, all owned by the City. The two proposed High hazard dams in King Cove are the Clear Creek Dam and Delta Creek Dam. Two other dams, Old Rams Creek Dam and Waterfall Creek Dam, have an unknown hazard classification.

Figure I-5 shows the location of the dams in King Cove as well as the potential inundation area if the dam were to fail.

As formal dam failure inundation mapping has not been completed for these dams, dam failure hazard areas in the community were identified by buffering the 1-mile downstream route by 0.1 miles (528 feet). This methodology does not account for site-specific topography or hydrology and may over or underestimate dam failure hazard areas in the community.

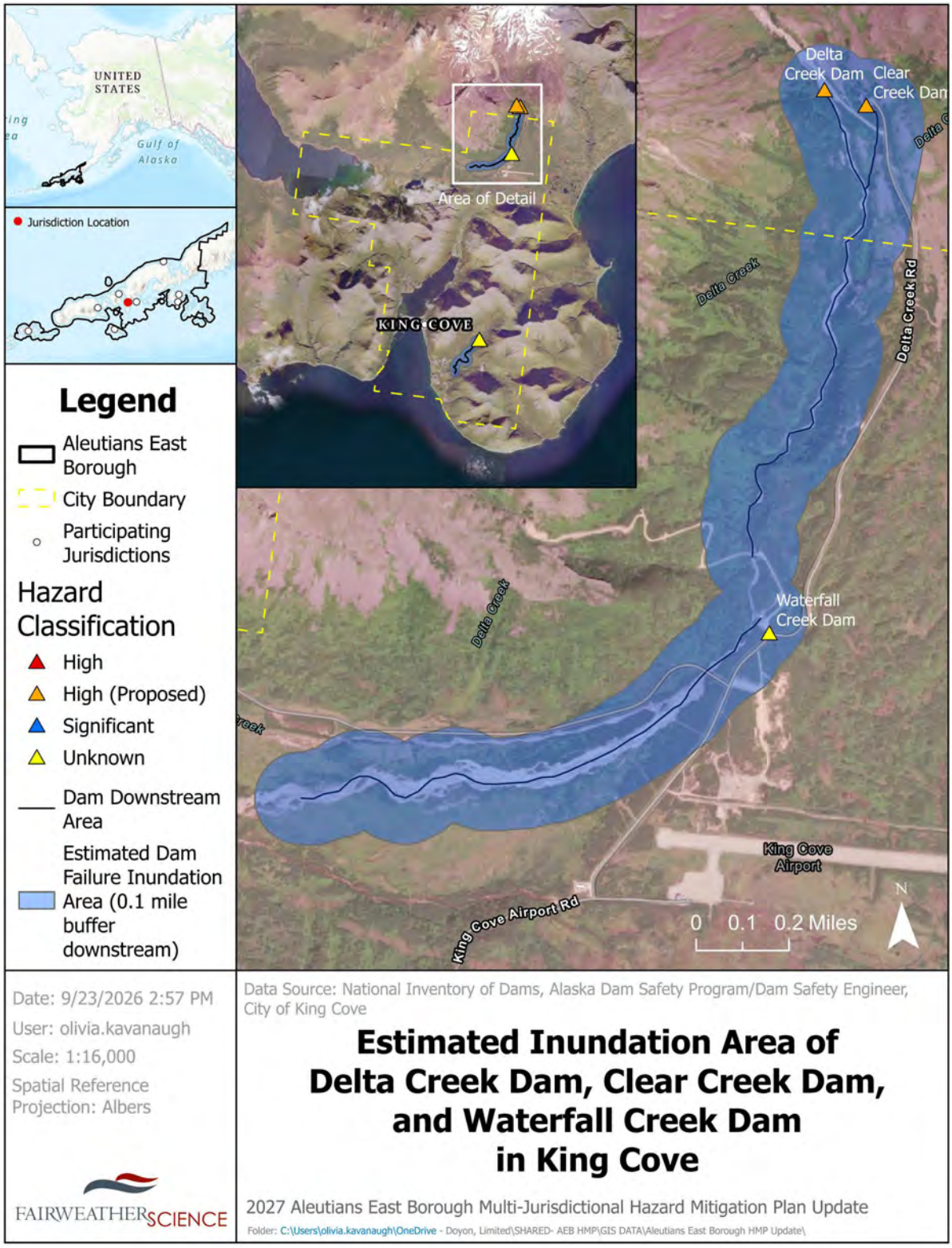



**Figure I-5- Location and Estimated Inundation Area of Delta Creek Dam, Clear Creek Dam, and Waterfall Creek Dam in King Cove**

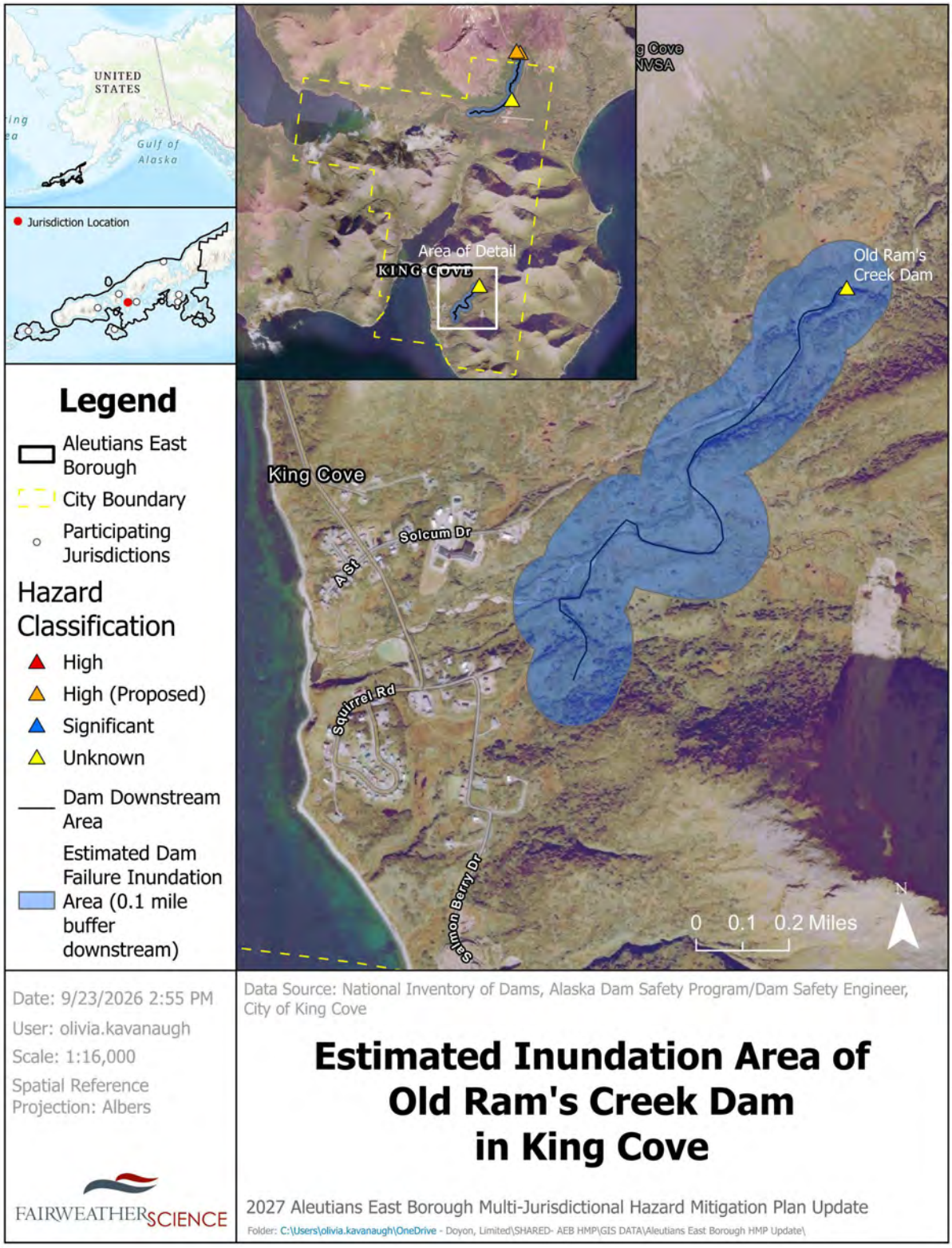



**Figure I-6- Location and Estimated Inundation Area of Old Ram's Creek Dam in King Cove**

| Clear Creek Dam | |
|---|---|
| Hazard Classification | High (Proposed by Alaska State Dam Engineer) |
| Owner | City of King Cove |
| Year Built | Unknown |
| Dam Type | Concrete |
| Dam Purpose | Hydroelectric |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | There is no information available about the inspection frequency of Clear Creek Dam, or the last inspection date. |
| Downstream Description | The dam outflow consists of a continuation of Clear Creek, which flows approximately 0.25 miles before its confluence with Delta Creek. Delta Creek flows another 4.5 miles downstream before depositing into Lenard Harbor. |
| Downstream Area | The Dam is located east of Anvil Mountain, in low shrub, alpine habitat. Clear Creek (the outflow) flows to its confluence with Delta Creek which then flows into more vegetated, lower lying lands for 4.7 miles before draining into Lenard Harbor. There are numerous roadways and two bridges downstream of the dam. |
| Downstream Dams | There are no dams immediately downstream of the Clear Creek Dam. |
| Downstream Bridges | There are three (3) bridges downstream of Clear Creek Dam. The first bridge allows Reservoir Dam Road to pass over Clear Creek approximately 300 feet downstream of the dam. The next two bridges occur downstream of the confluence of Clear Creek and Delta Creek, which means they are at risk of possible inundation from two different dams. The second bridge is approximately 0.9 miles downstream, allowing Waterfall Creek Road to pass over Delta Creek. The second bridge is approximately 1.1 miles downstream and allows AEB Route 1 to pass over Delta Creek. |
| Reservoir Area | The reservoir is continuously fed by Clear Creek upstream of the dam. The reservoir is narrow, approximately 150 feet long and 60 feet wide. |
| Downstream Development | King Cove Airport is located 1.5 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam. |
| General findings of the last inspection | There is no data available on the date of the last dam inspection, or what the condition assessment of Clear Creek dam is currently. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of Clear Creek and Delta Creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Clear Creek Dam. Based on the State of Alaska Dam Safety Engineer's preliminary inspection, critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: State of Alaska Dam Safety Engineer 2025, NHA 2023



Source: NHA 2023

**Figure I-7 - Clear CWAQreek Dam**

| Delta Creek Dam | |
|---|---|
| Hazard Classification | High (Proposed by Alaska State Dam Engineer) |
| Owner | City of King Cove |
| Year Built | 1975 |
| Dam Type | Concrete |
| Dam Purpose | Hydroelectric |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | No information is available on the inspection frequency of the Delta Creek Dam. |
| Downstream Description | The dam outflow consists of a continuation of Delta Creek, which flows approximately 0.25 miles before Clear Creek joins Delta Creek. From Delta Creek Dam, Delta Creek flows another 4.7 miles downstream before depositing into Lenard Harbor. |
| Downstream Area | The Dam is located east of Anvil Mountain, in low shrub, alpine habitat. Delta Creek (the outflow) then flows into more vegetated, lower lying lands for 4.7 miles before. There are numerous roadways and two bridges downstream of the dam. Clear Creek dam is also downstream of Delta Creek Dam. |
| Downstream Dams | There is one (1) dam downstream of the Delta Creek Dam. Clear Creek Dam is located approximately 450 feet downstream and to the east of the Delta Creek Dam-Clear Creek Dam is not located in the same water drainage of Delta Creek Dam. |
| Downstream Bridges | There are two (2) bridges downstream of Delta Creek Dam. The first bridge is approximately one mile downstream, allowing the Waterfall Creek Road to pass over Delta Creek. The second bridge is approximately 1.25 miles downstream and allows AEB Route 1 to pass over Delta Creek. |
| Reservoir Area | The reservoir area is very small, with an approximate length of 90 feet and width of 45 feet. The reservoir is continuously fed by Delta Creek. |
| Downstream Development | Although it never crosses Delta Creek, Airport Road parallels the creek for approximately 1.8 miles. King Cove Airport is located 1.6 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam. |
| General findings of the last inspection | No information has been made available about the dam's most recent inspection, or what condition it was rated. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of Delta Creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Delta Creek Dam. |

Source: State of Alaska Dam Safety Engineer 2026, NHA 2023

| Old Rams Creek Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of King Cove |
| Year Built | 1975 |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | The length of the dam is approximately 45 feet long. The height is unknown. |
| Drainage Area | Unknown |
| Inspection Frequency | The dam is inspected annually by the City of King Cove Public Works Department The last inspection was conducted in 2025. |
| Downstream Description | The dam outflow consists of a small, narrow outflow creek, Ram Creek. Ram Creek Dam Road parallels Ram Creek the entire length of the creek. The creek runs through typical Aleutian vegetation, primarily alders and salmonberry bushes and devoid of trees. The creek terminates 1.6 miles downstream of the dam into King Cove. |
| Downstream Area | The Dam is located Southwest of the city of King Cove. The most recent inspection noted the access trail from the Water Pumphouse to the dam was engulfed by salmonberry bushes, cow parsnip, and alder trees. |
| Downstream Dams | There are no dams immediately downstream of the Old Rams Creek Dam. |
| Downstream Bridges | There is one (1) bridge downstream of Old Rams Creek Dam. Approximately 1.5 miles downstream, a bridge crosses over the outflow stream, allowing Rams Creek Road to pass over the top. |
| Reservoir Area | Unknown |
| Downstream Development | Ram Creek Dam Road parallels Ram Creek the entire length of the creek. Approximately 1.5 miles downstream of the dam, King Cove School, King Cove Powerhouse and multiple residential structures are located North of the creek. South of the creek, immediately adjacent to the creek, is the King Cove Baseball Field, and approximately 0.2 miles South is the King Cove Public Works building and the Agdaagux Tribe of King Cove building. |
| General findings of the last inspection | No definitive inspection rating was given to Old Rams Creek Dam during the 2025 inspection. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Old Rams Creek Dam. Based on the critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: City of King Cove Planning Team

| Waterfall Creek Dam | |
|---|---|
| Hazard Classification | Unknown |
| Owner | City of King Cove |
| Year Built | 2017 |
| Dam Type | Unknown |
| Dam Purpose | Water Supply |
| Length x Height | The dam is approximately 60 feet long; the height is unknown. |
| Drainage Area | Unknown |
| Inspection Frequency | Waterfall Creek Dam is inspected annually by the City of King Cove Public Works. The last inspection was conducted in 2025. |
| Downstream Description | The dam outflow immediately flows into Delta Creek. Approximately 0.25 miles downstream, the water pumphouse is adjacent to the creek. The False Pass school, Mountain Valley Road, and the Isanotski Cemetery. |
| Downstream Area | Although it never crosses Delta Creek, Airport Road parallels the creek for approximately 1.8 miles. King Cove Airport is located 1.6 miles downstream of the dam, and 0.4 miles east of Delta Creek. Waterfall Creek Road and AEB Route 1 parallel and cross Delta Creek downstream of Delta Creek Dam |
| Downstream Dams | There are no dams immediately downstream of the Waterfall Creek Dam. |
| Downstream Bridges | There is one (1) bridge downstream of Waterfall Creek Dam. Approximately 0.25 miles downstream, a bridge crosses over the Delta Creek Dam, allowing AEB Route 1 to pass over. |
| Reservoir Area | Unknown |
| Downstream Development | The AEB Route 1 parallels Delta Creek for most of the route between the dam and King Cove. While approximately 1.2 miles to the South of Delta Creek, the King Cove Airport is downstream of the dam as well. The Water Pumphouse is the first structure downstream of the dam, approximately 0.25 miles downstream. There is no other development downstream of the dam. |
| General findings of the last inspection | There was no definitive inspection rating given to Waterfall Creek Dam during the 2025 inspection. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. |
| Recommended Hazard Potential Classification | There is no information available about the Hazard Potential Classification for Waterfall Creek Dam. Based on the critical infrastructure downstream and potential loss of life, it can be assumed the dam is a High Hazard Potential. |

Source: City of King Cove Planning Team

#### I.4.1.3.1 History

There is no history of dam failure in King Cove.

#### I.4.1.3.2 Extent (Magnitude and Severity)

Heavy rainfall and flood events may affect the structural integrity of dams that would affect the King Cove. Other natural hazards that are less predictable/ forecastable, like landslides or earthquakes, can also impact the structural integrity of dams and could lead to failure. Poor or infrequent maintenance, seismic activity, and severe weather can also weaken the integrity of a dam.

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation for all dams in King Cove was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

See Figure I-5 for potential inundation area from Delta Creek Dam, Clear Creek Dam, and Waterfall Creek Dam and Figure I-6 for potential inundation area from Old Ram's Creek Dam.

Based on the most recent condition assessments and the criteria identified in Table 5 of the Base Plan, the magnitude and severity of dam failure in King Cove is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### I.4.1.3.3 Impact

| Description of Impact | |
|---|---|
| Geography/Land | While there are no historic dam failures near King Cove, changes in the Clear or Delta Creek bed could be an impact of a dam failure. have resulted in shaking of landscapes, there are no documented changes to King Cove's geography from past earthquakes. |
| Infrastructure | There are no recorded dam failure impacts on infrastructure in King Cove. |
| People | There are no documented cases of serious injuries, deaths, or health effects from dam failure in King Cove. |
| Utilities | While dam failure could impact electricity supply in King Cove, there have been no documented cases of dam failure causing utility disruptions in King Cove. |
| Transportation | The primary transportation related impacts from a dam failure in King Cove are aircraft and vehicle interruptions. Impacts to air transportation associated with dam failure are the potential for infrastructure damage to the Airport Terminal and Runway due to flooding, and flooding of roadways accessing the airport or other upland access. |
| Economy | There are no recorded economic impacts due to dam failure in King Cove. |
| Subsistence Resources | There have been no recorded cases of a dam failure in King Cove that has impacted the community's access to subsistence resources. |

#### I.4.1.3.4 Probability of Future Events

Based on the criteria listed in Table 6 of the Base Plan and the most recent condition assessments, it is **Possible** that King Cove will experience a dam failure event in the calendar year; the event is probable within the next five years, the event has up to 1 in 5-year (1/5=20%) chance of occurring. History of events is less than or equal to 20%.

However, the State of Alaska Dam Safety Engineer warned of "condition creep", where observational assessments of AEB dams have rated dams more poorly than their most recent available condition rating. If dams in King Cove continue to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### I.4.1.3.5 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in King Cove. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in King Cove. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in King Cove. A potential outcome of changing climate in Alaska is an increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in King Cove. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in King Cove. Increased precipitation and frequency of severe weather events could contribute to more stress on dams in King Cove. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in King Cove as residents may relocate in and out of potential future inundation areas. Residents of King Cove may also relocate out of the area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in King Cove. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted in inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in King Cove.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes.

### I.4.1.4 Earthquake

#### I.4.1.4.1 Location

The entire geography of Belkofski Village and King Cove are vulnerable to earthquakes, due to their location on the Alaska-Aleutian subduction zone.

According to the 2023 State of Alaska HMP, Belkofski Village and King Cove are located in an area with the potential of **severe perceived shaking from earthquakes (PGA 34 – 65)**. Perceiving shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. These maps focus on the actual variations in shaking intensity across a region as felt by people and structures.

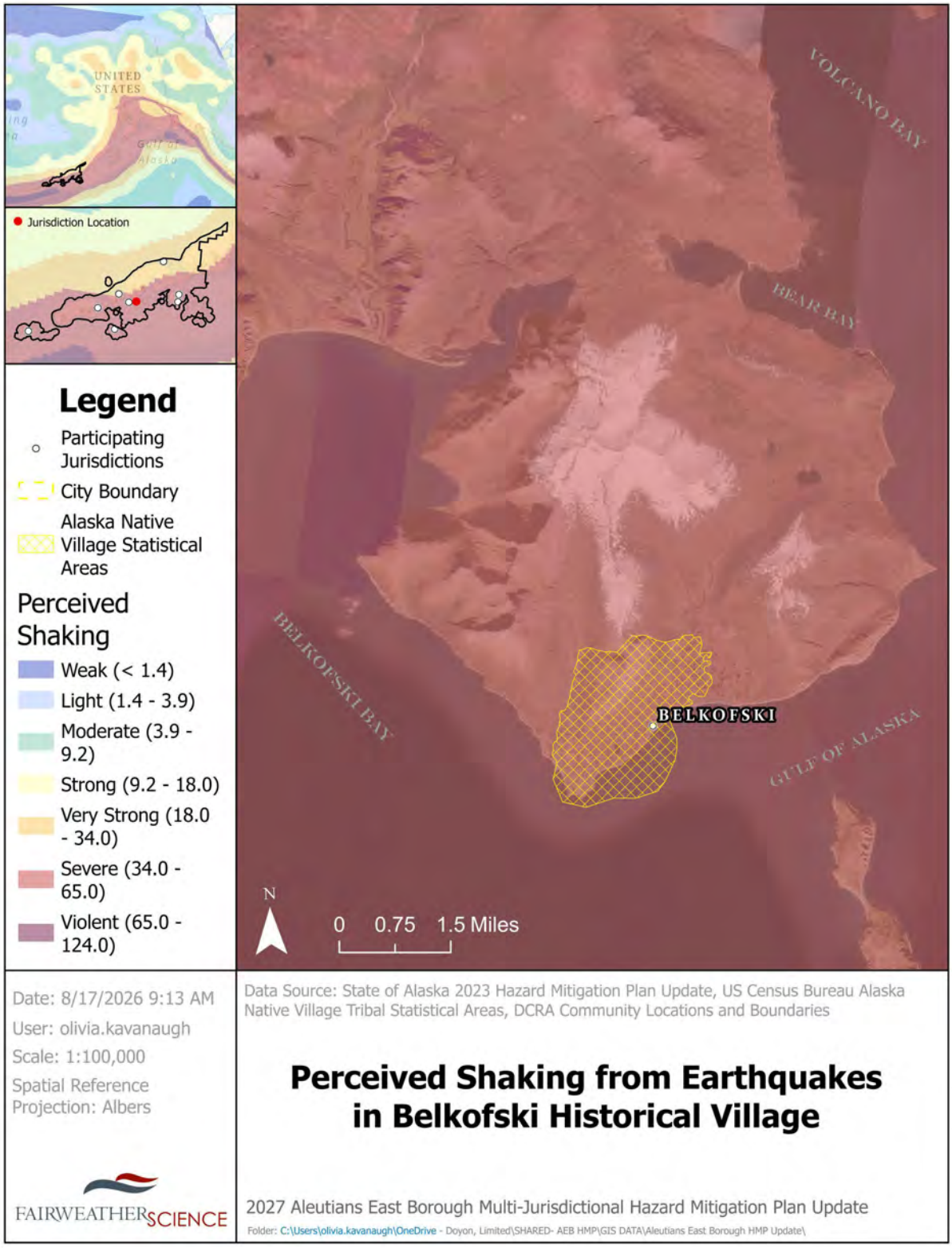



**Figure I-8 - Perceived Shaking from Earthquakes in Belkofski Village**

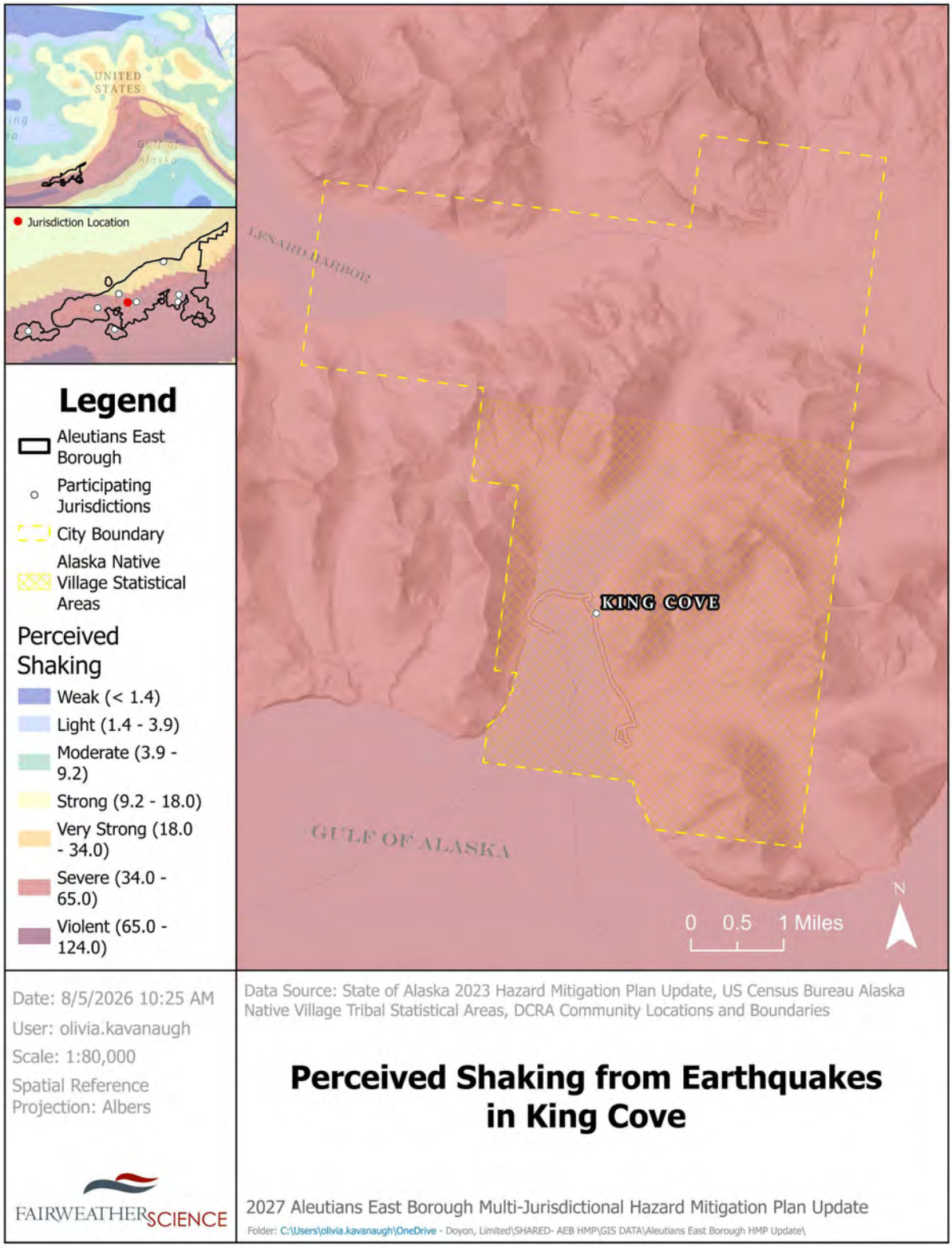



**Figure I-9 - Perceived Shaking from Earthquakes in King Cove**

#### I.4.1.4.2 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near King Cove) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including Belkofski Village and King Cove can be found in Table 11 of the Base Plan.

#### I.4.1.4.3 Extent (Magnitude and Severity)

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding King Cove experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Based on the extent of past earthquake events and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in Belkofski Village is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

Based on the extent of past earthquake events and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in King Cove is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### I.4.1.4.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | While historical earthquakes near Belkofski Village and King Cove have resulted in shaking of landscapes, there are no documented changes to the geography of Belkofski Village or King Cove from past earthquakes. Future earthquakes could create ground sink an/or cause landslides |
| Infrastructure | Historical earthquakes impacting Belkofski Village and King Cove have resulted in relatively minor physical damage to community infrastructure. Future earthquakes have the potential to flatten structures, damage roadways and dams, and other infrastructure. |
| People | There are no documented cases of serious injuries or health effects from an earthquake in Belkofski Village or King Cove. Historical earthquakes have generally resulted in felt shaking and resultant hazards (tsunami warnings) rather than widespread harm to residents.<br>The July 16, 2025, Magnitude 7.3 earthquake was the most significant seismic event affecting King Cove in the past five years.<br>Effects in King Cove included:<br>• Strong shaking felt throughout the community.<br>• A tsunami warning was issued for the Alaska Peninsula.<br>• Residents evacuated to higher ground as a precaution.<br>• The warning was later downgraded and canceled.<br>• No significant injuries or structural damage were reported.<br>• Numerous aftershocks followed over the next several days. |

| Description of Impact | |
|---|---|
| Utilities | There are no utilities in Belkofski Village and thus, they have not been impacted from earthquakes in Belkofski Village.<br>While strong shaking could damage utility equipment causing outages, there have been no documented cases of earthquakes causing utility disruptions in Belkofski Village or King Cove. |
| Transportation | Transportation has not been impacted in Belkofski Village due to earthquakes.<br>The primary transportation related impacts from an earthquake in King Cove are aircraft and vehicle interruptions. Impacts to air transportation associated with earthquakes are the potential for infrastructure damage to the Airport Terminal and Runway as well as potential tsunami related impacts to floatplanes landing or taking off if a significant wave occurs during that time. A tsunami could also damage boat harbors and marine vessels. Earthquakes of large magnitude have the potential to cause severe damage to roads and other transportation infrastructure. |
| Subsistence Resources | There have been no recorded cases of an earthquake in Belkofski Village or King Cove that has impacted the community's access to subsistence resources. |

#### I.4.1.4.5 Probability of Future Events

Belkofski Village and King Cove are located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing the Belkofski Village and King Cove.

During the past five years, the community experienced numerous earthquakes, including the July 16, 2025, magnitude 7.3 earthquake south of King Cove, which generated strong ground shaking and a tsunami warning requiring precautionary evacuations. While no major damage occurred, the event demonstrated the community's continued exposure to significant seismic and tsunami hazards. Given King Cove's location along the Alaska-Aleutian subduction zone, future damaging earthquakes remain highly probable and continue to represent one of the Tribe's greatest natural hazard risks.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that there will be an earthquake of any magnitude **within 100 miles of Belkofski Village** within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and based on the history of events, the probability of occurrence is greater than 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that there will be an earthquake of any magnitude **within 100 miles of King Cove** within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and based on the history of events, the probability of occurrence is greater than 33% likely per year.

#### I.4.1.4.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of earthquake events in Belkofski Village and King Cove is not anticipated to change in the future. |
| Location | The location of earthquake events in Belkofski Village or King Cove is not anticipated to change in the future. |

| Description of Future Conditions | |
|---|---|
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of earthquakes in Belkofski Village or King Cove. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of earthquakes in Belkofski Village or King Cove. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future earthquake events in Belkofski Village or King Cove. Earthquakes are impossible to predict. |
| Population Patterns | It is unlikely that future earthquakes will cause a change in population patterns in Belkofski Village or King Cove. |
| Land Use Development | Future climate conditions are not anticipated to influence Land Use Development due to earthquakes in Belkofski Village or King Cove. |
| Subsistence Resources | Future climate conditions are not anticipated to influence earthquake related impacts on subsistence resources in Belkofski Village or King Cove. |

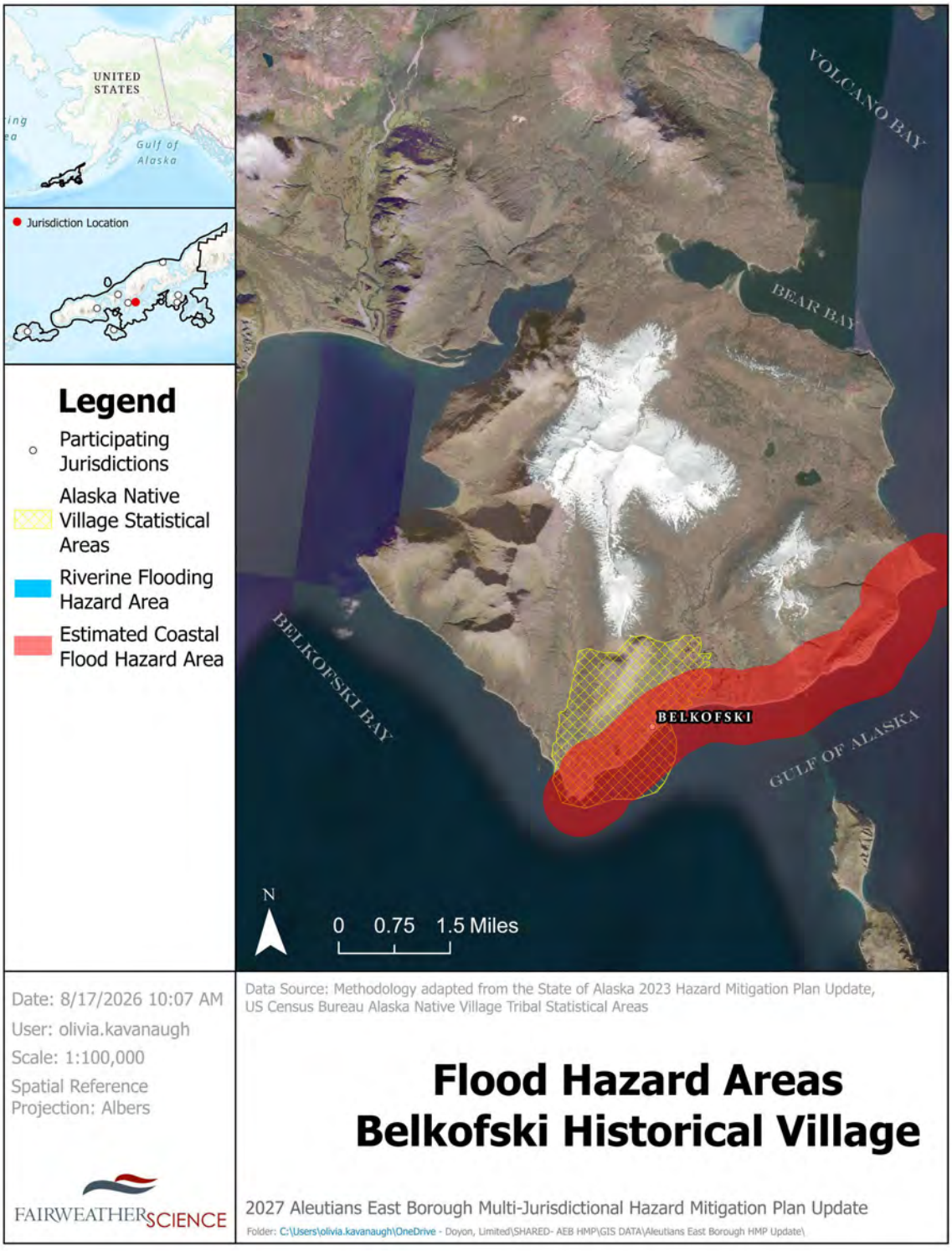
### I.4.1.5 Flood

#### I.4.1.5.1 Location

According to the 2023 State HMP, King Cove is within the identified Coastal Flooding Area (Figure I-10 and Figure I-11). The State of Alaska identifies coastal flooding hazard areas of 0.5 miles from the coastline (DHS&EM 2023). While the State HMP did not assess the Belkofski Village location, the same methodology was used in this analysis.

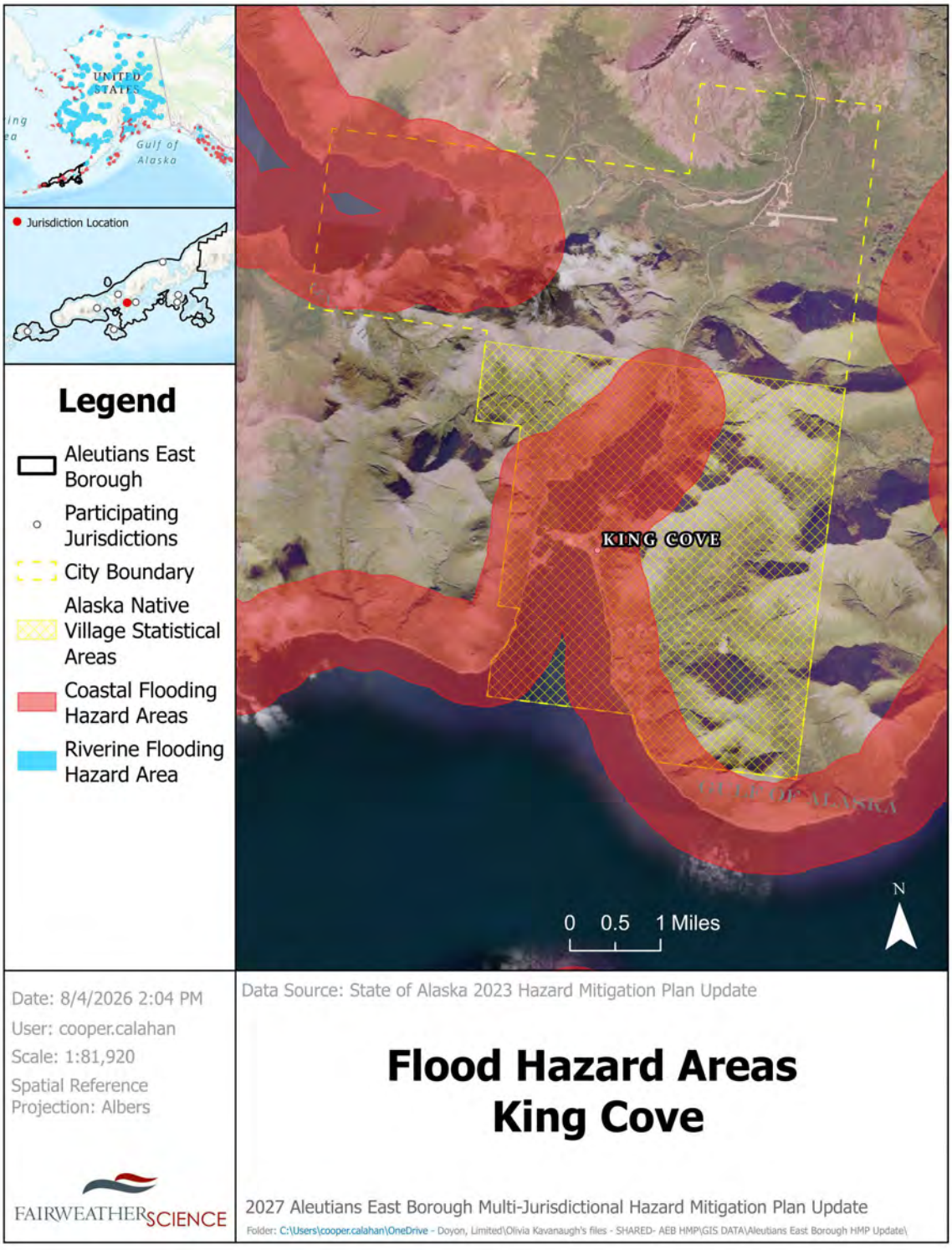
Due to the absence of major rivers in Belkofski Village or King Cove, riverine flooding is not considered a significant hazard, according to the Planning Team. Historical flooding has generally been limited to localized inundation of low-lying coastal areas, harbor facilities, and roadways during severe North Pacific storms.

The Planning Team indicated that in King Cove, Rams Creek and W Lagoon Rd experience flooding when strong winds combine with high tide.




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure I-10- Belkofski Village Flood Hazard Areas**




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure I-11- King Cove Flood Hazard Areas**

#### I.4.1.5.2 History

Historical flood event information is not available for the Belkofski Village.

NOAA's National Water Level Observation Network includes a historic flood event in King Cove. This was a storm surge event that occurred on October 23, 1977. Its impact is pending assessment.

The Planning Team reports the following notable flood events:

| Date | Event | Impacts |
|---|---|---|
| November 1974 | Coastal storm surge | High surf and coastal flooding affected low-lying shoreline areas and harbor facilities. Minor damage reported. |
| November 2011 | Bering Sea Superstorm | King Cove experienced storm surges, high waves, and localized coastal flooding. Marine facilities and transportation were affected, but catastrophic damage did not occur. |
| December 2020 | North Pacific winter storms | High tides, heavy rain, and strong winds caused localized ponding, shoreline erosion, and temporary flooding of low-lying areas. |
| 2021-2026 | Multiple coastal storms | Several storms produced minor coastal flooding, wave overtopping, and temporary roadway flooding, but no federally declared disasters specific to King Cove have been recorded. |

According to the Aleutians East Borough Planning Team, W Lagoon Rd in King Cove experiences annual flooding related to the King Tide. During the 2025 event, flooding cut off a portion of W Lagoon Rd, which resulted in 10-15 people unable to access or leave their homes.



Source: AEB 2025

**Figure I-12 – Flooding Along W Lagoon Rd in King Cove**

#### I.4.1.5.3 Extent (Magnitude and Severity)

The Alaska DGGS Coastal Hazards Program reports that they do not have flood extent data for the Aleutians East Borough or its communities.

Flooding extent can be as shallow as several inches of water, to large powerful floods several feet in depth.

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest has the lowest vulnerability.

King Cove tied for 59 out of 63 for flood threat ranking (Denali Commission 2019). Risk of the Belkofski Village was not assessed in this statewide assessment. While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking.

NOAA observed water levels in King Cove during a 2022 flood event reported 5 feet above the MHHW (Station 9459881).

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding **in Belkofski Village** is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding **in King Cove** is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### I.4.1.5.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | The Planning Team did not report specific impacts to the geography/land in Belkofski Village due to flood events.<br>The Planning Team reported minor damage to low-lying shoreline areas in King Cove due to a coastal storm surge event in November 1974. Shoreline loss occurred because of winter storm-driven flooding in December 2020. |
| Infrastructure | The Planning Team did not report specific impacts to infrastructure due to flood events in Belkofski Village.<br>The Planning Team reported that a November 2011 flood event impacted marine facilities in King Cove. |
| People | The Planning Team did not report personal injury or death related to flooding in Belkofski Village or King Cove. |
| Utilities | There are no utilities in Belkofski Village and thus; have not been impacted from flood events in Belkofski Village.<br>The Planning Team did not report specific impacts to utilities due to flooding events in King Cove. |
| Transportation | The Planning Team did not report specific impacts to transportation in Belkofski Village due to flooding events. |

| Description of Impact | |
|---|---|
| | The Planning Team reported that marine transportation in King Cove was impacted in a November 2011 Bering Sea storm, which caused flooding. Multiple coastal storms in the last five years have caused temporary roadway flooding. |
| Economy | The Planning Team did not report specific economic impacts due to flooding events in Belkofski Village or King Cove. |
| Subsistence Resources | The Native Village of Belkofski identified potential disruption of access to the historic village and traditional-use areas from coastal erosion, storm surge, high tides, and snowmelt flooding. The Tribe reported concerns regarding loss of beach access, changes to a creek associated with high tides, and loss of trails and traditional routes from snowmelt flooding. These access impacts may affect continued use of ancestral and subsistence landscapes. |

#### I.4.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that **Belkofski Village** will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

Based on previous occurrences and the criteria identified in Table 5 of the Base Plan, it is **Likely** that **King Cove** will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### I.4.1.5.6 Future Climate Conditions

This information is applicable to Belkofski Village as well as King Cove.

| Description of Future Conditions | |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in the Aleutians East Borough Planning Area as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in the Aleutians East Borough Planning Area is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in the Aleutians East Borough Planning Area, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in the Aleutians East Borough Planning Area. |

| Description of Future Conditions | |
|---|---|
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br><br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br><br>According to the International Panel on Climate Change's 2025 Arctic Report Card, the Aleutian Islands are considered "Sub Arctic". Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021).<br><br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in the Aleutians East Borough Planning Area, however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |
| Population Patterns | It is possible that future flood events will cause changes in population patterns in the Aleutians East Borough Planning Area as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### I.4.1.6 Ground Failure/Landslide

#### I.4.1.6.1 Location

Belkofski Village and King Cove are prone to landslides due to the steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity.

Many landslide paths coincide with avalanche paths, especially at higher elevations. Unmapped areas within the Borough remain to be studied for landslide hazards and will be included in future updates of this plan as resources become available to evaluate those areas for landslide hazards.

Figure I-13 estimates landslide hazard areas in Belkofski Village.

As landslide hazard areas are not well defined in the community and detailed terrain data, such as LiDAR, were not available, ArcGIS Pro basemaps, including satellite imagery, topographic maps, and terrain data, were used to identify mountainous areas, elevation, and observable slope characteristics.

Potential landslide hazard areas were manually delineated based on these features. Where available, photographs of the surrounding geography were also reviewed to confirm the presence of steep slopes and other terrain characteristics indicative of potential landslide hazard.

***This assessment is intended to identify potential areas of landslide hazard at a planning level. It is not a substitute for site-specific landslide hazard mapping, geotechnical investigations, or detailed evaluation of local topography, snow conditions, and site-specific conditions. Areas identified through this assessment should be considered preliminary and should be subject to further investigation where development or other activities may be exposed to landslide hazards.***

The King Cove area has underwater locations that display signs of submarine landslides. Further research is needed to map more areas of the sea floor to determine past and potential future submarine landslides.

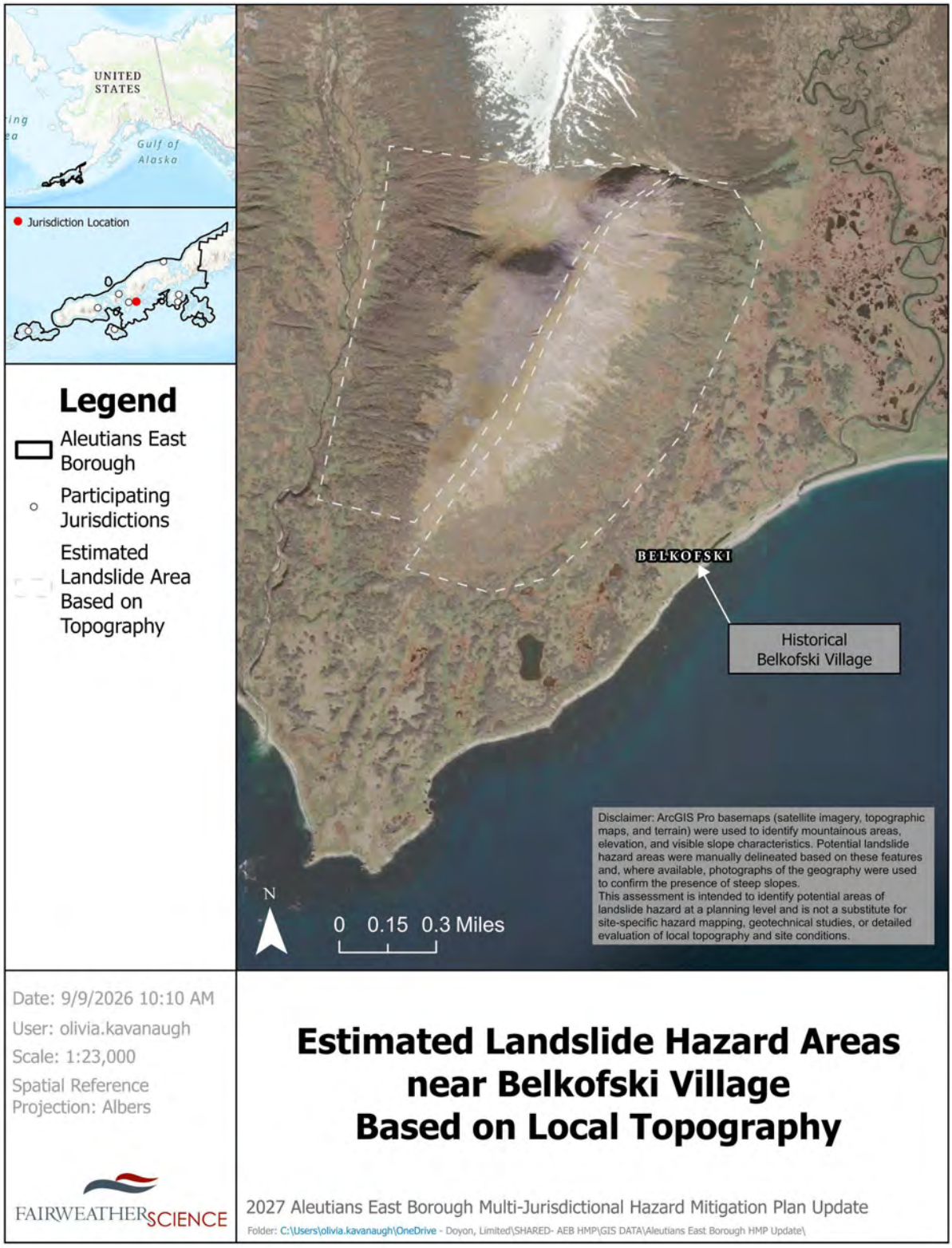



**Figure I-13- Estimated Landslide Hazard Areas near Belkofski Village**




**Figure I-14 - Historical Landslide Events Near King Cove**

#### I.4.1.6.2 History

According to the Alaska DGGS Library, there are seven (7) recorded landslides in the vicinity of King Cove, and one (1) recorded land flow in the vicinity of King Cove. There are no recorded landslides near Belkofski Village.

In 2021, King Cove residents stated that an avalanche occurred over 50 years ago and carried a house down the slope to the beach. An *Anchorage Daily Times* article of 1960 describes an event in which a dwelling in King Cove was flattened by strong winds during a snow storm at approximately 10 p.m. on January 19, 1960. Five young children and one adult died during this event. In the article, their deaths are attributed to exposure while pinned under the wreckage of their home, which was blown over by winds of about 60 knots. The temperature was reported to be 18 degrees F at the time. While the news report cites wind as the cause of the damage, people in King Cove report that it was a mud and rock avalanche on Ram's Creek Road which continued past the house and reached the bay.

According to the City of King Cove, in 2025, there were numerous landslides between Cold Bay and King Cove, as well as on the other side of the bay from King Cove.

The April 1st, 1946, earthquake near Unimak Island (approximately 42 m east of Akutan, 35 miles west of Cold Bay and 45 miles east of King Cove) created a tsunami wave that reached all the way to Antarctica. For years, speculation existed that the large tsunami was aided by a submarine landslide due to the disproportionate waves created by the earthquake. In 1996, the USGS GLORIA discovered numerous slope failures (historic submarine landslides) along the eastern Aleutian Shelf. An exceptionally large failure was found at the location of the now named Ugamak Slide (Fryer, Watts, Patson 2004). The Ugamak Slide consists of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

If the Ugamak Slide did indeed occur on April 1st, 1946, it is likely that much of the seismic motion, especially at longer periods, was from the slide itself. A tectonic shock – a shallow subduction earthquake – was probably the trigger but differentiating it from the rest of the motion may prove impossible. The evidence for a landslide source to the 1946 tsunami is substantial (Fryer, Watts, Patson 2004).

#### I.4.1.6.3 Extent (Magnitude and Severity)

There are no recorded landslides near Belkofski Village.

There have been seven (7) recorded landslides and one (1) recorded debris flow in the vicinity of King Cove. The Alaska Landslide Inventory Database provided no additional information outside of deciphering the landslides from the debris flow (DGGS 2026). Subaerial landslides on sloped terrain in the City of King Cove pose a threat to critical facilities or human life. Subaerial landslides near bodies of water also pose a threat to critical facilities or human life in the Planning Area as they may trigger a tsunami or seiche.

Landslides have been documented near bodies of water in King Cove- these events have the possibility to produce a tsunami or seiche. Ongoing monitoring and modelling of these areas is needed to identify if future subaerial landslides have the potential to trigger a tsunami.

A landslide (both submarine and subaerial) can trigger a tsunami. Due to King Cove's location near the Pacific Ocean, and exposure to the open ocean, a submarine landslide-induced tsunami affecting the Planning Area in the future is a possibility. In the past, submarine landslides created secondary hazards (tsunamis), that have impacted the City of King Cove.

There have been no documented landslides in the jurisdiction of King Cove, however the City of King Cove reported that there were numerous landslides in 2025. These slides damaged hillsides and roadways leading between Cold Bay and King Cove. Some of these slides also damaged hillsides and roadways across the bay from King Cove.

Based on the Alaska Landslide Inventory Database, it can be estimated that the historical landslides recorded in King Cove range in width of less than 100 feet to over 500 feet.

The largest discovered underwater landslide deposit in the Aleutians East Borough is the Ugamak Submarine Slide. The Ugamak Submarine Slide consisted of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

Based on available data and modelling, historical events, and the criteria identified in Table 5 of the Base Plan, the magnitude and severity of landslides and resultant damages to people and infrastructure **in Belkofski Village** is considered to be **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on available data and modelling, historical events, and the criteria identified in Table 5 of the Base Plan, the magnitude and severity of landslides and resultant damages to people and infrastructure **in King Cove** is considered to be **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### I.4.1.6.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | There are no reports of impacts to the land due to landslides in Belkofski Village or King Cove.<br><br>There are anecdotal reports from the City of King Cove detailing steep slopes near the roadways to Cold Bay and across the bay. These hillsides were impacted by landslides and are presumably more prone to another slide or an avalanche. |
| Infrastructure | There are anecdotal reports of roadways being damaged by landslides in 2025. The roads leading to Cold Bay, and across the bay from King Cove were covered by landslides. Landslides could impact other roadways in the future and could damage structures near steep slopes. A submarine landslide induced tsunami could damage infrastructure along the coastline as well. Critical Infrastructure at risk of landslide impacts include the Alaska Commercial Company and Silver Bay Stock room. |
| People | There are no reports of injuries or fatalities due to landslides in Belkofski Village or King Cove. Injuries or deaths could be caused by landslides due to tsunami waves or debris and soil/earth burying or hitting individuals with force. |
| Utilities | There are no reports of utility disruptions due to landslides in Belkofski Village or King Cove. Underground water, sewer, and electric lines could be damaged by earth movement. |
| Transportation | Road travel to Cold Bay, and across the bay from King Cove were impacted by landslides in 2025. This could happen again in the future, as well as air travel being limited by runway surfaces being damaged or covered by landslide debris. A submarine landslide could cause a tsunami and inundate the runway or roadways leading to the airport. |
| Economy | There are no recorded economic impacts due to landslides in Belkofski Village or King Cove. |
| Subsistence Resources | There are no reported landslide impacts on subsistence resources in Belkofski Village or King Cove. |

#### I.4.1.6.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that **Belkofski Village** will experience a landslide event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that **King Cove** will experience a landslide event in the calendar year. There is a 1 in 5 years chance of occurring (1/5 = 20%), and the history of subaerial landslide events is greater than 10% but less than or equal to 20% per year.

#### I.4.1.6.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of landslides in the future in Belkofski Village or King Cove. |
| Location | It is possible that future climate conditions will influence the location of future landslides in Belkofski Village or King Cove. Landslide probability is location specific, and numerous variables must be considered. It is common for debris flows to recur in the same channel or to shift slightly. Other types of landslides may reoccur in the same place or the area directly adjacent to a previous landslide. King Cove is located in a highly seismic area, which can trigger landslides at any time, and create areas prone to landslides that did not used to be.<br>Ground failures related to more frequent severe weather events, an increase in atmospheric rivers, and potential droughts are expected to appear in locations that were previously frozen and are now thawing. This includes areas that are immediately adjacent to recently thawed ground and where overlying vegetation has been removed. However, landslides also occur in areas with no prior known instabilities due to changing conditions such as increased rainfall, strong earthquake shaking, and human activities (DHS&EM 2023). |
| Extent (Magnitude and Severity) | It is likely that future climate conditions will influence the magnitude of future landslides in Belkofski Village or King Cove. Landslides are expected to increase in magnitude with increased areas of effect as severe weather events increase in frequency (IPCC 2019).<br>Future climate conditions are expected to increase landslide frequency of all intensities, and as people develop across the landscape, including into hazardous areas, there will likely be an increase in more significant outcomes in the future (DHS&EM 2023). |
| Impact | It is likely that future climate conditions will influence the impact of future landslides in Belkofski Village or King Cove. Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from an increase in atmospheric rivers, severe weather events, and glacial decline (IPCC 2019), which could increase future ground failure events and resultant impacts. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of future landslides in Belkofski Village or King Cove. Although the probability of ground failure is location-specific, it is likely, and increasing, due to a changing climate. Severe weather events such as precipitation and wind are a direct result of atmospheric warming. Atmospheric rivers are becoming increasingly common and increase the intensity and duration of precipitation events at regional and local scales. Landslide events are directly related |

| Description of Future Conditions | |
|---|---|
| | to high intensity precipitation events, and those are likely to become more common over greater geographic regions of Alaska (DHS&EM 2023). |
| Population Patterns | It is possible future climate conditions will influence population patterns in Belkofski Village or King Cove. Belkofski Village is uninhabited and unlikely to be influenced. King Cove is experiencing a slight increase in population as an overall trend. Since 2020, the population has increased 0.5% annually, from 757 to 784 (US Census 2026). This may eventually mean more of the resident population living in landslide hazard areas, however an increased growing season due to future climate conditions could lengthen the tourist season. An increase in tourists throughout the year could possibly increase the number of people that are at risk of landslide hazards at any given moment. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Belkofski Village or King Cove. Belkofski Village is uninhabited and unlikely to be influenced. Limiting development and relocating existing development outside of landslide hazard areas would change the development in these areas. A landslide warning system could require infrastructure development, and more development outside of the landslide zones could increase land use to accommodate displaced residents. It is also possible that land developed in the future, or that has already been developed, may eventually become prone to landslide hazards. |
| Subsistence Resources | It is possible that future climate conditions will result in landslides impacting subsistence resources in Belkofski Village and King Cove. Landslides could wipe out land access to certain parts of coastline, berry gathering locations, or trails leading to hunting or fishing grounds. |

### I.4.1.7 Invasive Species

#### I.4.1.7.1 Location

The entire natural area surrounding Belkofski Village and King Cove is vulnerable to the spread of invasive species, particularly terrestrial invasive plants and slugs. King Cove's location adjacent to a busy coastal port is the primary human-caused pathway in the spread of invasive species in the region.

There are no public-submitted entries of documented invasive species in Belkofski Village in the AKEPIC database.

In King Cove, several species of invasive terrestrial plants and animals have been documented, including:

- Tall Buttercup
- Orange Hawkweed
- Creeping Buttercup
- Smooth Brome
- Oxeye Daisy
- European Mountain Ash
- European Black Slug

Figure I-15 depicts the locations of documented invasive terrestrial plant species in King Cove, as reported by community members in the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database.

Note that the "downtown" area may have more documented invasive species sightings than other areas of the community due to its higher population density and greater likelihood of observation and reporting. Therefore, the number of reported sightings may not necessarily reflect the actual distribution or abundance of invasive species across the community.

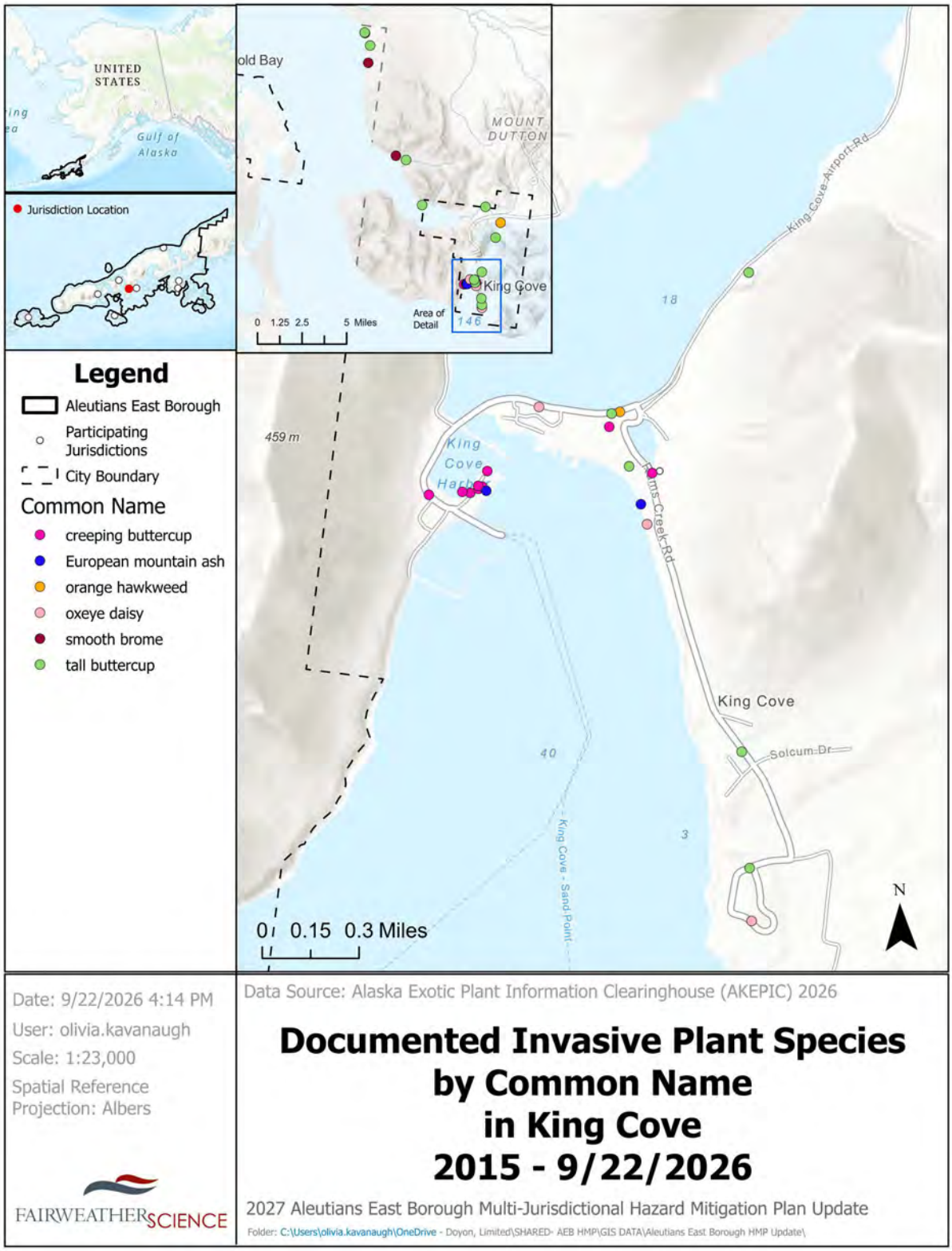



**Figure I-15- Documented Invasive Plant Species by Common Name in King Cove**

#### I.4.1.7.2 History

King Cove has had historical vessel traffic related to the fishing and shipping industry, which has contributed to the spread of invasive species in the region. While there have been no historical occurrences of invasive rats or invasive aquatic animals in the community, King Cove has had a history with the spread of invasive terrestrial plants. While there are documented occurrences of invasive plants in King Cove, the exact timeline of arrival is difficult to confirm.

While invasive species are a concern throughout Belkofski Village, there is no recorded data that displays the historical occurrences in the area.

According to a Planning Team member, European Black Slugs are widespread throughout King Cove, with reports of the slugs infiltrating gardens and areas along local roads.

#### I.4.1.7.3 Extent (Magnitude and Severity)

There is limited data on invasive species occurrences for Belkofski Village. Detailed information on invasive species, invasiveness ranking, and total infested area (acreage) is not available for Belkofski Village.

Although damages to the lands surrounding King Cove from invasive species has been limited, there are several non-native plants with a high invasiveness that have occurred near the community.

Table I-1 displays the non-native plant occurrences that have occurred within King Cove. A total of 53 acres has been infested by invasive terrestrial plants in King Cove.

As there are no public-submitted entries of documented invasive species in Belkofski Village in the AKEPIC database, the total infested acreage in Belkofski Village is unknown.

**Table I-1- Non-Native Plant Occurrences in King Cove**

| Invasive Plant Species | Total Infested Area (acres) | Invasiveness Ranking (0-100) |
|---|---|---|
| **Tall Buttercup** | 52.03 | 60 |
| **Orange Hawkweed** | 1.001 | 79 |
| **Creeping Buttercup** | 0.142 | 72 |
| **Smooth Brome** | 0.12 | 62 |
| **Oxeye Daisy** | 0.03 | 61 |
| **European Mountain Ash** | 0.011 | 65 |
| **Grand Total** | **53.334 acres** | **Maximum Ranking: 79** |

**While invasive species are a concern for many communities, at this time, the presence of these species is not impacting critical facilities in Belkofski Village or King Cove.**

Based on previous occurrences and the criteria identified in Table 5 of the Base Plan, the historical extent to the Belkofski Village from invasive species are considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on previous occurrences and the criteria identified in Table 5 of the Base Plan, the magnitude and severity to King Cove from invasive species are considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### I.4.1.7.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | While invasive species data for Belkofski Village is limited, an infestation can outcompete native plants and wildlife in the area.<br>The primary impact of invasive species on the land surrounding King Cove has been localized non-native plant infestations, which can outcompete native plants and wildlife. |
| Infrastructure | There is limited evidence that invasive species have directly impacted infrastructure in Belkofski Village or King Cove. |
| People | While invasive species can affect resources that people depend on, Belkofski Village or King Cove has no history of invasive species directly affecting the residents of the community. |
| Utilities | There have been no documented cases of invasive species causing utility disruptions in Belkofski Village or King Cove. |
| Transportation | Transportation is identified as a major pathway for invasive species to spread throughout King Cove. Due to the nature of invasive species in the community, there is little evidence to show that these species cause direct damage to transportation infrastructure in Belkofski Village or King Cove. |
| Economy | There have been no reports of an invasive species infestation resulting in significant economic impacts in Belkofski Village or King Cove. |
| Subsistence Resources | Invasive species pose a potential threat to subsistence resources in Belkofski Village or King Cove. Species like the European Black Slug are known to feed on plants and berries, a key aspect to subsistence culture for the community. |

#### I.4.1.7.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that **Belkofski Village** will experience an invasive species event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that **King Cove** will experience an invasive species event in the calendar year. There is a 1 in 5 years chance of occurring (1/5 = 20%), and the history of subaerial landslide events is greater than 10% but less than or equal to 20% per year.

#### I.4.1.7.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is possible future climate conditions will influence the nature of invasive species in Belkofski Village or King Cove. Warmer temperatures and longer growing seasons may allow some invasive species to become established in areas where they don't historically occur. |
| Location | It is likely future climate conditions will influence the location of invasive species in Belkofski Village or King Cove. Changes in temperature and precipitation patterns |

| Description of Future Conditions | |
|---|---|
| | may allow invasive species to expand into new terrestrial and marine areas of King Cove. |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of invasive species in Belkofski Village or King Cove. Future changes may create favorable conditions for certain invasive species, allowing populations to spread at a rapid rate. |
| Impact | It is likely future climate conditions will influence the impacts of invasive species in Belkofski Village or King Cove. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of invasive species in Belkofski Village or King Cove. As environmental conditions change, areas that were previously unsuitable for certain invasive species may become more favorable for establishment and spread, which increases the probability of future events in Belkofski Village or King Cove. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Belkofski Village or King Cove. Changes in the distribution and abundance of invasive species may alter the availability of food and habitat relied upon by wildlife and residents of King Cove. |
| Land Use Development | It is unlikely future climate conditions will influence future land use development in Belkofski Village or King Cove. |
| Subsistence Resources | It is likely future climate conditions will influence subsistence resources in Belkofski Village or King Cove. Changes in ocean conditions, weather patterns, and species distribution may affect the availability and accessibility of important subsistence resources. The introduction or expansion of invasive species could further impact native species that support subsistence activities in Belkofski Village or King Cove. |

### I.4.1.8 Sediment Deterioration and Land Destabilization

#### I.4.1.8.1 Location

Sediment deterioration and land destabilization can occur throughout Belkofski Village and King Cove, with coastal land destabilization being the biggest concern for the area.

Since Belkofski Village and King Cove is classified as coastal areas, they are susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surges, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.

While the extent of sediment deterioration and land destabilization in King Cove varies by location, facilities across the bay may be increasingly vulnerable to future destabilization.

#### I.4.1.8.2 History

While sediment deterioration and land destabilization data on the impacts at the historical village of Belkofski is limited, the Planning Team is concerned about future destabilization events limiting access to beaches used for subsistence activities.

The history of coastal sediment deterioration and land destabilization in King Cove varies by location due to the localized nature of storms in the community. According to a 2007 USACE study, erosion occurs along Gould's Lagoon shoreline and that the roadway connecting the Old Ram and New Ram subdivisions is the most vulnerable.

Additionally, it has been reported that the runway at the King Cove Airport experiences soft conditions, particularly during spring breakup and prolonged periods of heavy rain (AirNav 2026).

#### I.4.1.8.3 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of sediment deterioration and land destabilization vary throughout select communities.

In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk. King Cove was categorized in Erosion Group 3, which places it at a lower risk of sediment deterioration and land destabilization according to the study.

Due to King Cove being included in Group 3, there is limited data on the extent of sediment deterioration and land destabilization in the community.

Belkofski Village was not profiled in this study and formal data detailing the extent of sediment deterioration and land destabilization for the area is limited.

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the historical extent of land destabilization in **Belkofski Village** is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the extent of land destabilization in **King Cove** is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### I.4.1.8.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding King Cove has been damages to shoreline and beaches, particularly along areas exposed to waves and storms.<br>In the community, impacts from destabilization has been documented near on roads near critical facilities like the harbor.<br>While sediment deterioration and land destabilization is identified as a concern in Belkofski Village, there is limited data of its impact to the geography and land in the area. |
| Infrastructure | Sediment deterioration and land destabilization impacts in King Cove have been documented near the airport runway. Continued land destabilization could threaten additional community infrastructure and increase mitigation costs.<br>While sediment deterioration and land destabilization is identified as a concern in Belkofski Village, there is limited data of its impact to the infrastructure in the area. |
| People | While sediment deterioration and land destabilization can affect residents of King Cove by threatening homes and access to subsistence areas, direct impacts to people in King Cove resulting from land destabilization have been limited.<br>While sediment deterioration and land destabilization is identified as a concern in Belkofski Village, there is limited data of its impact to the people that are utilizing the area. |
| Utilities | There have been no documented impacts to the utilities in King Cove from sediment deterioration and land destabilization events.<br>There are no utilities in Belkofski village that can be impacted by sediment deterioration and land destabilization events. |
| Transportation | The primary transportation related impacts from a sediment deterioration and land destabilization event in King Cove are damage to roads, boardwalks, and other transportation infrastructure. There have been no reports of land destabilization resulting in substantial disruptions to transportation in Belkofski Village or King Cove. |
| Economy | There are a substantial number of roads in King Cove that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities.<br>There have been no reports of land destabilization resulting in substantial economic impacts in Belkofski Village. |
| Subsistence Resources | A primary concern related to subsistence resources in Belkofski Village and King Cove is the loss of subsistence fish camps that have been used for generations, which have the potential to be washed-out or the access restricted during a storm.<br>The Tribe has also identified trails and traditional access routes as values at risk where coastal change, flooding, or severe weather could restrict continued access to the historic village and surrounding traditional-use areas. |

#### I.4.1.8.5 Probability of Future Events

The low-lying geography influences the likelihood of continued sediment deterioration and land destabilization in Belkofski Village or King Cove.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that **Belkofski Village** will experience a sediment deterioration and land destabilization event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that **King Cove** will experience a sediment deterioration and land destabilization event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### I.4.1.8.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in Belkofski Village or King Cove. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in Belkofski Village or King Cove. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal land destabilization in King Cove (AK DGGS 2026). |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in Belkofski Village or King Cove. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in Belkofski Village or King Cove. Projected increases in precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in Belkofski Village or King Cove. Although the probability for land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Belkofski Village or King Cove. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of King Cove entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Belkofski Village or King Cove. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |

| Description of Future Conditions | |
|---|---|
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in Belkofski Village or King Cove. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

### I.4.1.9 Severe Weather

#### I.4.1.9.1 Location

All of the Belkofski Village and King Cove are vulnerable to severe weather events.

#### I.4.1.9.2 History

Detailed history of severe weather events in Belkofski Village is not available.

The Planning Team reported a high wind event, a freezing rain/ice storm event, and an extreme cold event in the winter of 2025-2026 in King Cove.

#### I.4.1.9.3 Extent (Magnitude and Severity)

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather in the **Belkofski Village** is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather **in King Cove** is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### I.4.1.9.4 Impact

| | Description of Impact |
|---|---|
| Geography/ Land | General severe weather impacts to geography/land include:<br>Dense Fog: Persistent marine fog can contribute to slick conditions on coastal trails and roads.<br>Drought: Drought conditions can impact subsistence resources, ecosystem functions, and increase wildfire risk. Drought can dry out tundra and reduce lake levels.<br>Extreme Cold: Extended cold spells can cause ice buildup on coasts and tundra and potentially increase freeze-thaw damage.<br>Heavy Rain: Heavy rain can cause land destabilization, sediment transport, and flooding. Heavy rain also increases landslide and debris-flow potential in steep terrain. Saturated soils can destabilize slopes.<br>Heavy Snow: Heavy snow can alter flooding and melt patterns, impacting trail access and distribution of flora and fauna.<br>High Winds: High winds drive wave runup, worsening storm impacts such as land destabilization.<br>**The Planning Team did not report specific previous impacts due to severe weather in Belkofski Village and King Cove.** |
| Infrastructure | General severe weather impacts to infrastructure include:<br>Dense Fog: Dense fog can indirectly impact physical infrastructure by causing delays in repairs and reducing safe operation of equipment and infrastructure such as small harbors.<br>Drought: Drought can impact water system intakes and increase wear on community water infrastructure |

| | Description of Impact |
|---|---|
| | Extreme Cold: Extreme cold can cause infrastructure and home damage when pipes freeze or extreme cold impacts mechanical systems. In extreme cold conditions, frozen pipes, equipment failures, and structural strain can occur more frequently.<br><br>Heavy Rain: Heavy rain can overwhelm drainage and flood protection systems, causing localized flooding. It can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, bulk fuel storage, docks, landfills, cemeteries, and homes. Freezing rain can cause damage to infrastructure (tree limbs with freezing rain can damage power lines, ice buildup can damage water conveyance systems).<br><br>Heavy Snow: Heavy snow can load roofs and structures, increasing the risk of damage or collapse.<br><br>High Winds: High wind can cause infrastructure and home damage, such as damage to roofing, utility lines, docks, and fuel storage.<br><br>**The Planning Team did not report specific previous impacts due to severe weather in Belkofski Village and King Cove.** |
| People | General severe weather impacts to people include:<br><br>Dense Fog: Dense fog can interrupt travel and affect access to critical medical care. Reducing visibility, dense fog can increase the risk of injury, especially in settings such as boat harbors and fishery facilities where operational hazards are already present.<br><br>Drought: Water shortages can impact drinking water security and increase wildfire risk, presenting risks to human health and safety.<br><br>Extreme Cold: Extreme cold events pose dangers to human health, including frostbite and hypothermia. Extreme cold can also lead to heating emergencies for residents, such as being without heat for extended periods of time.<br><br>Heavy Rain: Heavy rain can flood homes, increase the risk of mold, other health risks, and displacement.<br><br>Heavy Snow: Heavy snow can make mobility difficult for people, especially those with mobility impairments. Heavy snow can also increase the risk of injury and social isolation, especially for elders.<br><br>High Winds: High winds can occur any time of year. In the winter, high winds associated with winter storms can lead to dangerous wind. High winds can lead to dangerous driving, boating, and general transportation conditions for people, leading to isolation and reduced access to community and healthcare services. Flying debris increases injury risk. Home damage from high winds impacts housing security.<br><br>**The Planning Team did not report specific previous impacts due to severe weather in Belkofski Village and King Cove.** |
| Utilities | General severe weather impacts to utilities include:<br><br>Dense Fog: Dense fog can slow maintenance work and complicate utility inspections.<br><br>Drought: Drought can strain community water systems and reduce availability of drinking water from lakes, streams, or reservoirs. It can also drive up the cost of water treatment.<br><br>Extreme Cold: These events, especially when prolonged, can increase energy demand. Extreme cold can freeze lines and increase the need for utility repairs.<br><br>Heavy Rain: Heavy rain can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, bulk fuel storage, docks, landfills, |

| | Description of Impact |
|---|---|
| | cemeteries, and homes. Freezing rain can cause damage to powerlines and pipelines. Heavy rain can increase contamination risk if and when floodwaters breach utility infrastructure such as sewage lagoons.<br><br>Heavy Snow: Heavy snow can cause power disruptions and delay deliveries of utility-related materials such as fuel.<br><br>High Winds: High winds can knock down trees and powerlines, directly or indirectly damaging utility infrastructure and potentially causing prolonged power outages.<br><br>**The Planning Team did not report specific previous impacts due to severe weather in Belkofski Village and King Cove.** |
| Transportation | General severe weather impacts to transportation include:<br><br>Dense Fog: Dense fog reduces aviation and marine visibility, causing delays and cancellations. Fog can also impact emergency response and medevac operations.<br><br>Drought: Extreme drought can contribute to low water levels in rivers and bays, potentially limiting navigability. Dust can lead to road degradation.<br><br>Extreme Cold: Extreme cold can disrupt transportation and complicate emergency response. Specifically, extreme cold can reduce vehicle reliability and lead to aircraft delays.<br><br>Heavy Rain: Heavy rain can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, and docks. Roads and runways can wash out or otherwise become impassible, limiting travel in and out of villages.<br><br>Heavy Snow: Heavy snow can block roads and runways, impede emergency response and delay freight and transportation. When combined with high wind conditions, blinding blizzards that impede transportation may occur.<br><br>High Winds: High winds can create dangerous marine conditions, disrupting freight and travel. Airplanes and medevac flights will not fly above certain wind speed thresholds. High winds increase turbulence hazards.<br><br>**The Planning Team did not report specific previous impacts due to severe weather in Belkofski Village and King Cove.** |
| Economy | General severe weather impacts to the economy include:<br><br>Dense Fog: Dense fog can disrupt fishing and transport-dependent economic activities.<br><br>Drought: Low water availability can stress fisheries and increase costs related to water utilities and wildfires.<br><br>Extreme Cold: Extreme cold can increase heating costs, burdening households and businesses. Other economic activities such as marine activity may decline in periods of extreme cold.<br><br>Heavy Rain: Heavy rain related damages raise repair costs for homeowners, local governments, and local businesses.<br><br>Heavy Snow: Heavy snow events increase costs related to snow removal. Heavy snow events can delay freight and transportation.<br><br>High Winds: High wind events can interrupt fishing and shipping activities. Wind-related damage can be expensive to repair. |

| | Description of Impact |
|---|---|
| | **The Planning Team did not report specific economic impacts from severe weather in Belkofski Village or King Cove.** |
| Subsistence Resources | The Planning Team reports that heavy/drifting snow risks closing traditional trails and routes. They report that extreme cold in the winter of 2025-2026 led to a loss of plants and berry bushes. Freezing rain/ice storms in the same winter led to loss of game, berries, and traditional plants for harvest. |

#### I.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Belkofski Village will experience a severe weather event (dense fog, extreme cold, heavy rain, heavy snow, or high winds), within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that King Cove will experience a severe weather event (dense fog, extreme cold, heavy rain, heavy snow, or high winds), within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

**Projected Conditions for Belkofski (Taxtamax̂)**

In Belkofski (Taxtamax̂), average annual temperatures may increase by about 9°F by the end of the century.

Spring temperatures are projected to increase the most (+9°F).

Winter may transition from below freezing to above freezing in the future.

Models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+24%).

In the past, this area had very low flammability. Future flammability may be about the same.

*Source: UAF/SNAP 2026- Northern Climate Reports*

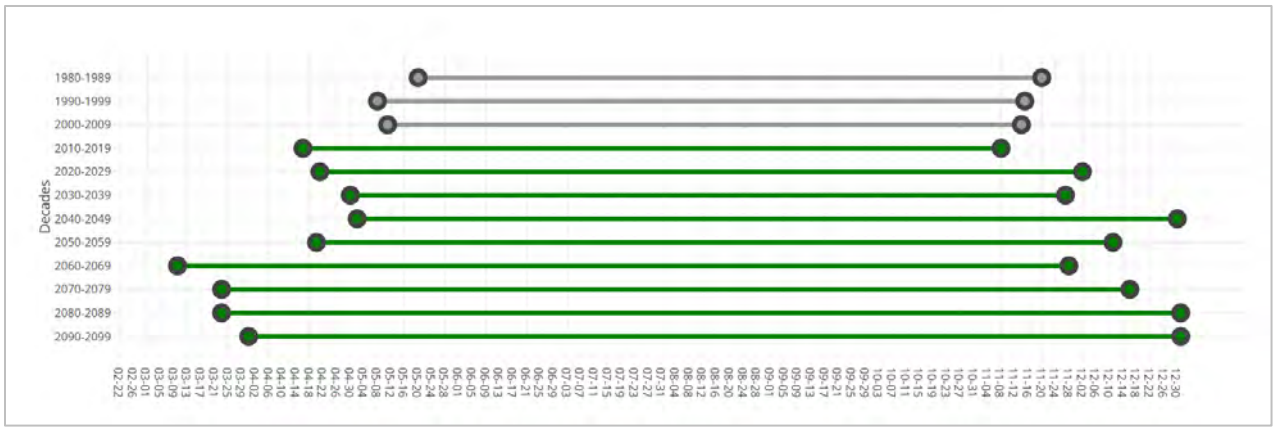
### I.4.1.9.6 Future Climate Conditions

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in Belkofski Village or King Cove. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in Belkofski Village or King Cove. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in Belkofski Village or King Cove. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in Belkofski Village or King Cove. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in Belkofski Village or King Cove. | It is unlikely that future climate conditions will influence the nature of future high wind events in Belkofski Village or King Cove. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in Belkofski Village or King Cove. | It is possible that future climate conditions will influence the location of future drought/water supply events in Belkofski Village or King Cove. | It is unlikely that future climate conditions will influence the location of future extreme cold events in Belkofski Village or King Cove. | It is unlikely that future climate conditions will influence the location of future heavy rain events in Belkofski Village or King Cove. | It is unlikely that future climate conditions will influence the location of future heavy snow events in Belkofski Village or King Cove. | It is unlikely that future climate conditions will influence the location of future high wind events in Belkofski Village or King Cove. |
| Extent | Due to a projected increase in future precipitation in the King Cove and the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in King Cove and Belkofski Village could increase (UAF/SNAP 2025). | In Belkofski Village, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026). Spring temperatures are projected to increase the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). Climate changes within Alaska are likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In Belkofski Village, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026). Spring temperatures are increasing the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). Despite these temperature trends, extreme cold events are still possible. | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in Belkofski Village and King Cove. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP). Extreme precipitation events have occurred throughout Alaska with increasing frequency. In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). In Belkofski Village, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>Belkofski Village and King Cove experience severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months. Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). Winter may transition from below freezing to above freezing in the future in Belkofski Village, impacting the frequency of heavy snow events (UAF/SNAP 2026). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). However, UAF/SNAP modeling projects similar wind speeds in King Cove in the future (UAF/SNAP 2026). Specific modeling for Belkofski Village was not available. |
| Impact | Projected increases in precipitation and associated moisture availability in the Aleutians East Borough and King Cove could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026).<br>Reduced visibility from | Overall temperature trends in Belkofski Village are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for Belkofski Village | While overall temperature trends in Belkofski Village are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events | In Belkofski Village, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026). Precipitation modeling is not available for King Cove. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | and King Cove (Alaska DHS&EM 2023). | remain possible for communities in the Aleutians East Borough. | | above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir levels. The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in Belkofski Village and King Cove by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in Belkofski Village are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In Belkofski Village, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in Belkofski Village are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In Belkofski Village, winter is likely to have more precipitation (UAF/SNAP 2026). Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in both Belkofski Village and King Cove may increase.<br>These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in Belkofski Village and King Cove may include loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in the Belkofski Village or King Cove Planning Areas. | Future conditions of drought are not anticipated to significantly affect population patterns in Belkofski Village and King Cove. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in Belkofski Village and King Cove. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | In Belkofski Village, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026). | It is not likely that future conditions influencing heavy snow will impact changes in Belkofski Village and King Cove population patterns. | It is not likely that future conditions of high winds will impact changes in Belkofski Village or King Cove population patterns. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in the Belkofski | Future conditions of drought are not anticipated to substantially affect future land use development in Belkofski Village and King Cove. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in Belkofski | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in Belkofski | It is not likely that future conditions influencing heavy snow will impact changes in Belkofski Village and King Cove land use development. | It is not likely that future conditions of high winds will impact changes in Belkofski Village or King Cove land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | Village or King Cove Planning Areas. | | Village and King Cove, as extreme cold is a regional hazard. | Village and King Cove population patterns. | | |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in the Belkofski Village or King Cove Planning Areas. | Future conditions of drought may affect subsistence resources in Belkofski Village and King Cove, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity. Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | Future conditions of extreme cold may affect subsistence resources in Belkofski Village and King Cove, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity. Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | It is possible that future conditions of heavy rain will impact changes in Belkofski Village and King Cove land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above the Planning Area, leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to development of landslide monitoring equipment and/or landslide barriers/diversion structures. | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, thermal stress, and nutrient availability for subsistence species. | It is not likely that future conditions of high winds will impact changes in Belkofski Village or King Cove subsistence resources. |

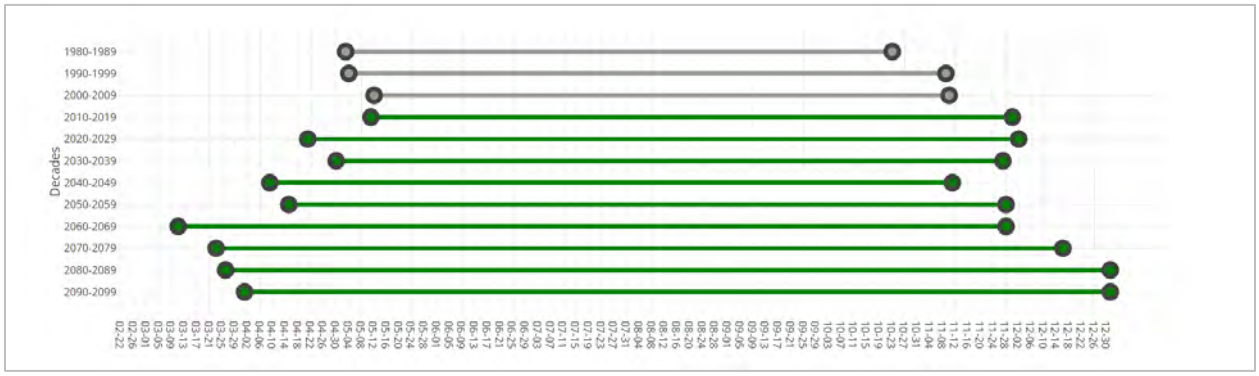
Figure I-17 models historical and future duration of the growing season in Belkofski from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure I-16- Historical and Future Projected Changes in Growing Season in Belkofski (1980-2099)**

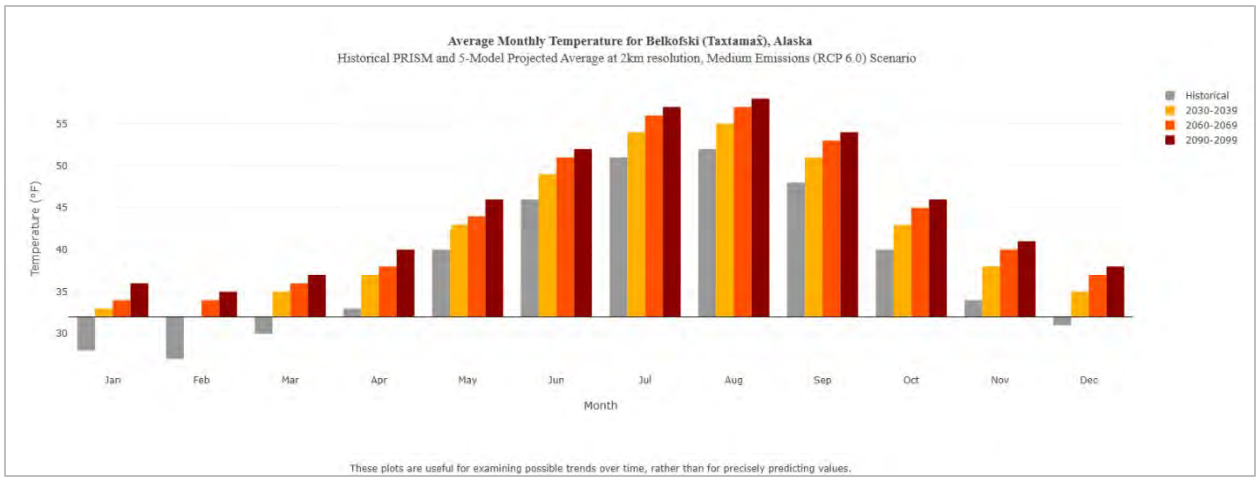
Figure I-17 models historical and future duration of the growing season in King Cove from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure I-17- Historical and Future Projected Changes in Growing Season in King Cove (1980-2099)**

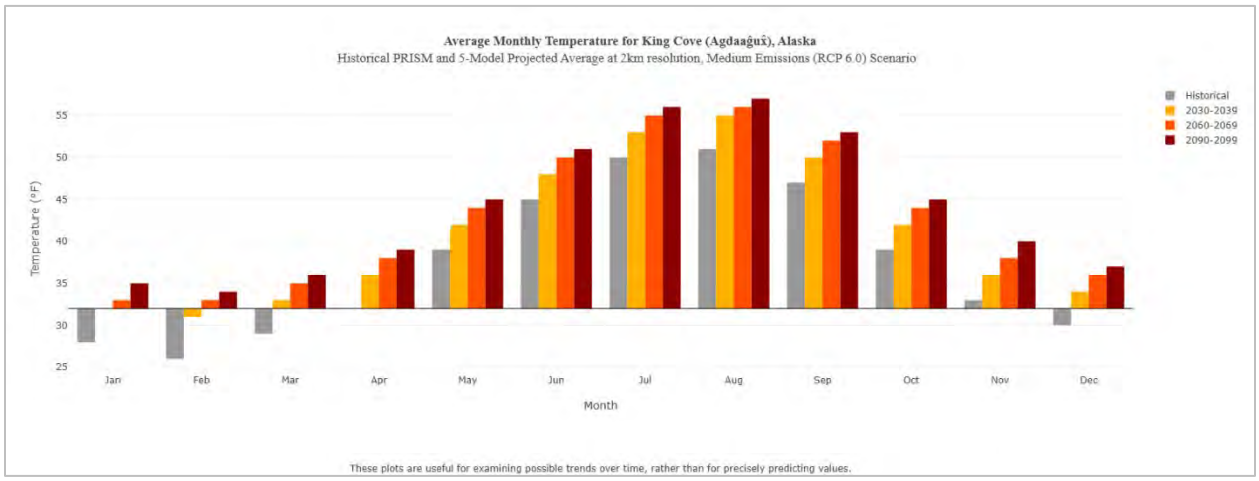
Figure I-18 models historical and future average monthly temperatures in Belkofski from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure I-18- Historical and Future Projected Average Monthly Temperature in Belkofski (1980-2099)**

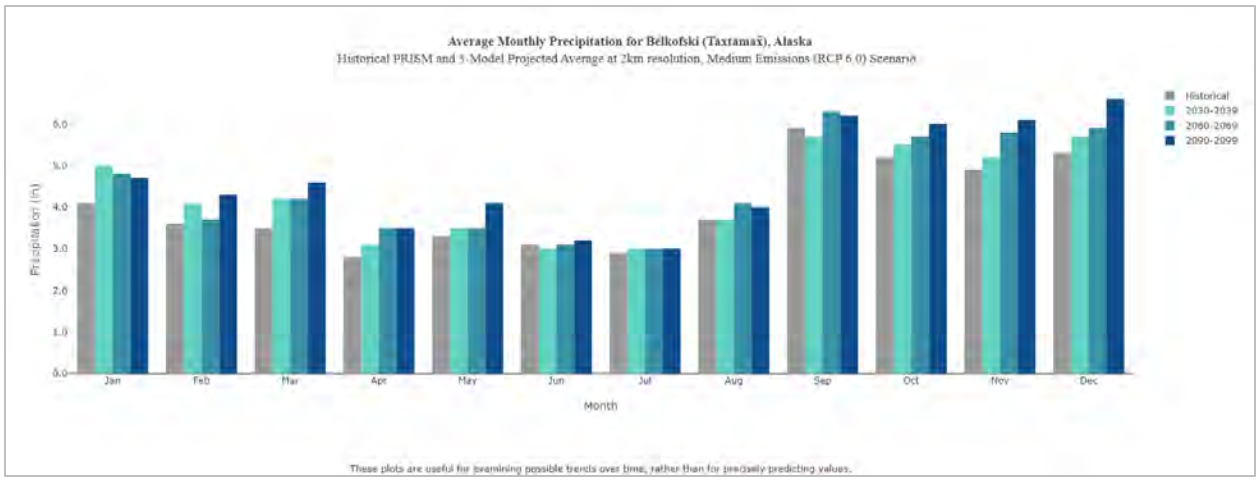
Figure I-19 models historical and future average monthly temperatures in King Cove from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure I-19- Historical and Future Projected Average Monthly Temperature in King Cove (1980-2099)**

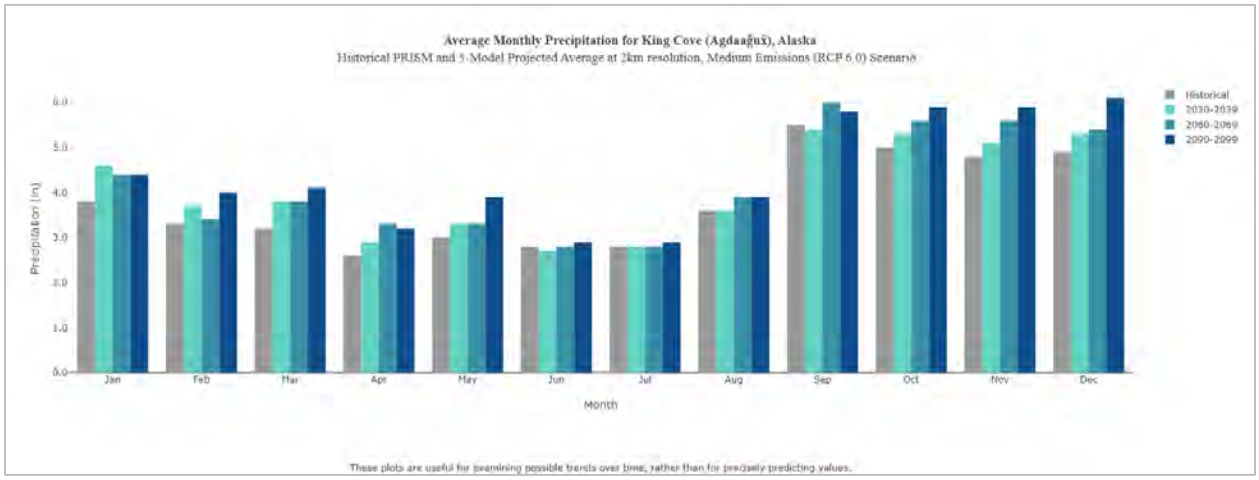
Figure I-20 models historical and future average monthly precipitation in Belkofski from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026

**Figure I-20- Historical and Future Projected Average Monthly Precipitation in Belkofski (1980-2099)**

Figure I-21 models historical and future average monthly precipitation in King Cove from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure I-21- Historical and Future Projected Average Monthly Precipitation in King Cove (1980-2099)**

### I.4.1.10 Tsunami

#### I.4.1.10.1 Location

Formal tsunami inundation mapping is not available for Belkofski Village. Therefore, the tsunami hazard area shown in Figure I-22 was estimated by applying a 0.5-mile buffer around shoreline, consistent with the coastal flooding hazard methodology used in the 2023 State of Alaska Hazard Mitigation Plan Update. ***This estimated hazard area is intended for planning purposes only and does not represent actual or modeled tsunami inundation extent, wave characteristics, or depth of inundation.***

Most critical facilities and infrastructure in King Cove are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community.

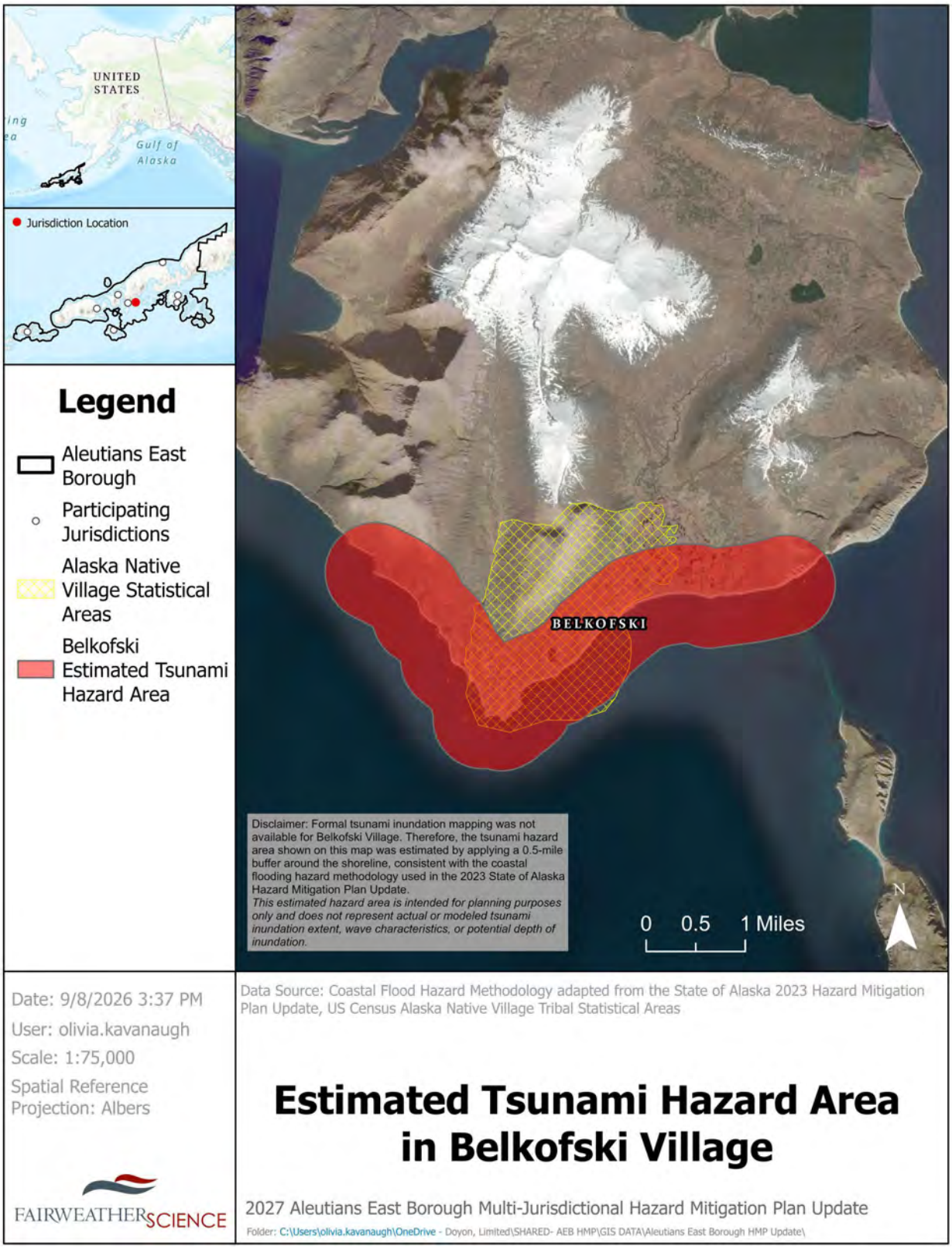



**Figure I-22- Estimated Tsunami Hazard Areas in Belkofski Village**

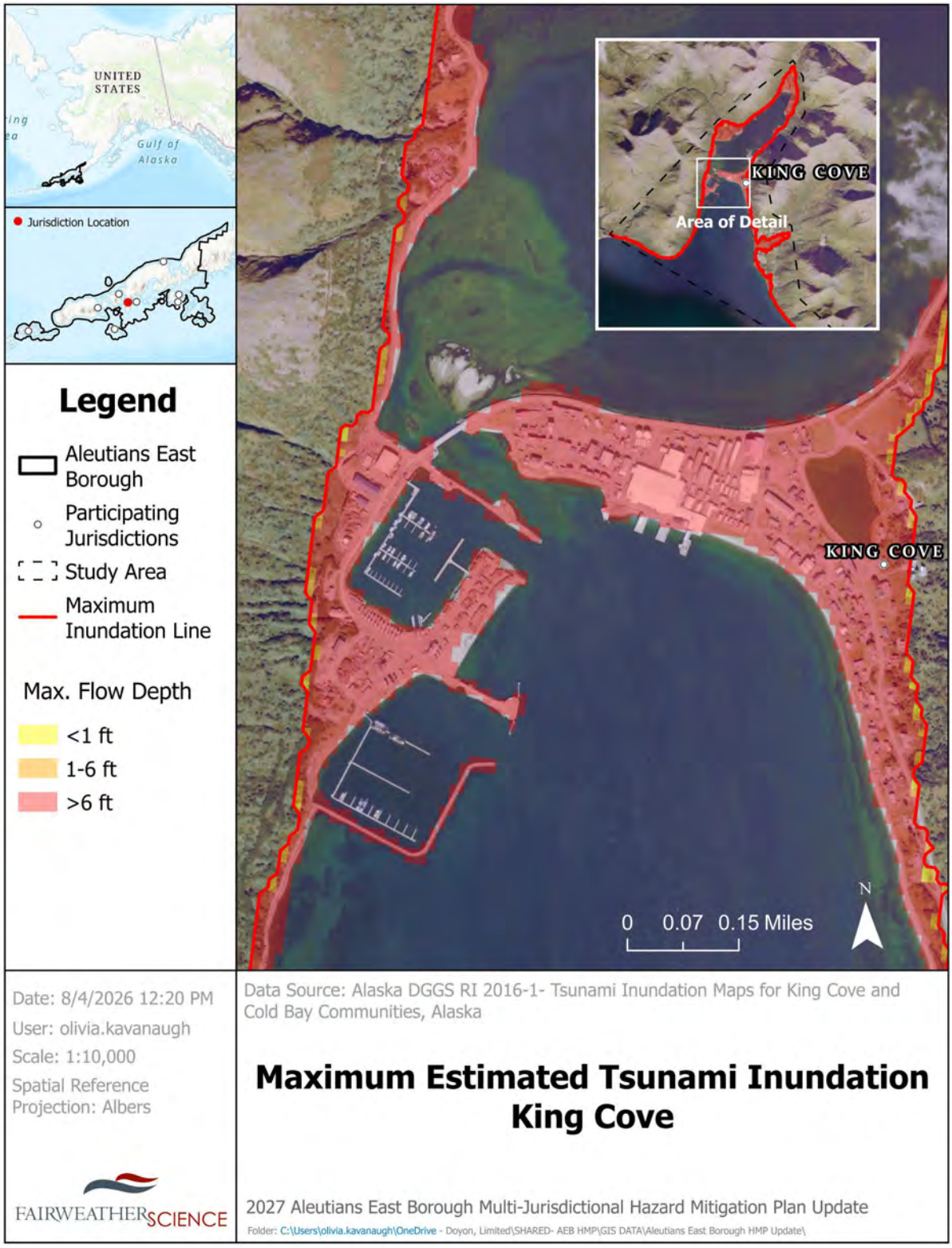



**Figure I-23 - Maximum Estimated Tsunami Inundation in King Cove**

### I.4.1.10.2 History

There are no historic tsunami runup events documented in Belkofski Village.

King Cove is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. See Table 17 in the Base Plan for a comprehensive list from the NOAA National Centers for Environmental Information (NCEI) detailing the earthquake-generated tsunamis with observed or measured waves throughout the Planning Area.

Since 1788, there have been 15 documented tsunami runup events in King Cove. The most recent runup event in King Cove was recorded in July 2025.

Since 2021, there have been two tsunami warnings issued for King Cove.

- July 29, 2021 (M8.2 Chignik earthquake)
- July 16, 2025 (M7.3 south of King Cove earthquake)

**Table I-2 - Historic Tsunami Runups in King Cove (1788 – August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 15 | 1946-04-01 | KING COVE, AK | EQ + LS | 8.6 | 4.92 |
| 58 | 2006-05-03 | KING COVE, AK | EQ | 8 | 0.23 |
| 61 | 2006-11-15 | KING COVE, AK | EQ | 8.3 | 0.66 |
| 63 | 2009-09-29 | KING COVE, AK | EQ | 8.1 | 0.43 |
| 64 | 2010-02-27 | KING COVE, AK | EQ | 8.8 | 2.07 |
| 68 | 2011-03-11 | KING COVE, AK | EQ | 9.1 | 1.77 |
| 75 | 2014-04-01 | KING COVE, AK | EQ | 8.2 | 0.33 |
| 77 | 2015-09-16 | KING COVE, AK | EQ | 8.3 | 0.85 |
| 81 | 2020-10-19 | KING COVE, AK | EQ | 7.6 | 2.10 |
| 84 | 2021-07-29 | KING COVE, AK | EQ | 8.2 | 0.72 |
| 86 | 2021-08-12 | KING COVE, AK | EQ | 8.1 | 0.62 |
| 88 | 2022-01-15 | KING COVE, AK | VO | N/A | 3.28 |
| 90 | 2023-07-16 | KING COVE, AK | EQ | 7.2 | 0.49 |
| 93 | 2025-07-16 | KING COVE, AK | EQ | 7.3 | 0.26 |
| 95 | 2025-07-29 | KING COVE, AK | EQ | 8.8 | 1.51 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

**April 1946 Aleutian Islands Earthquake and Tsunami**

The 1946 Aleutian Islands earthquake and tsunami struck on April 1, 1946, triggered by a powerful magnitude 8.6 undersea earthquake in the Aleutian Trench off Unimak Island, Alaska, which sent devastating Pacific-wide waves that resulted in a handful of deaths in Alaska and 159 deaths in Hilo, Hawaii.

The tsunami completely obliterated the steel-reinforced concrete Scotch Cap Lighthouse on Unimak Island (in the Aleutians East Borough, approximately 60 miles east of Akutan) and killed all five Coast Guard keepers (National Coast Guard Museum 2024).

Tsunami run-up of nearly 5 feet was recorded in King Cove due to this event.



Source: National Coast Guard Museum 2024

**Figure I-24- Scotch Cap Lighthouse: Before and After the 1946 Tsunami**

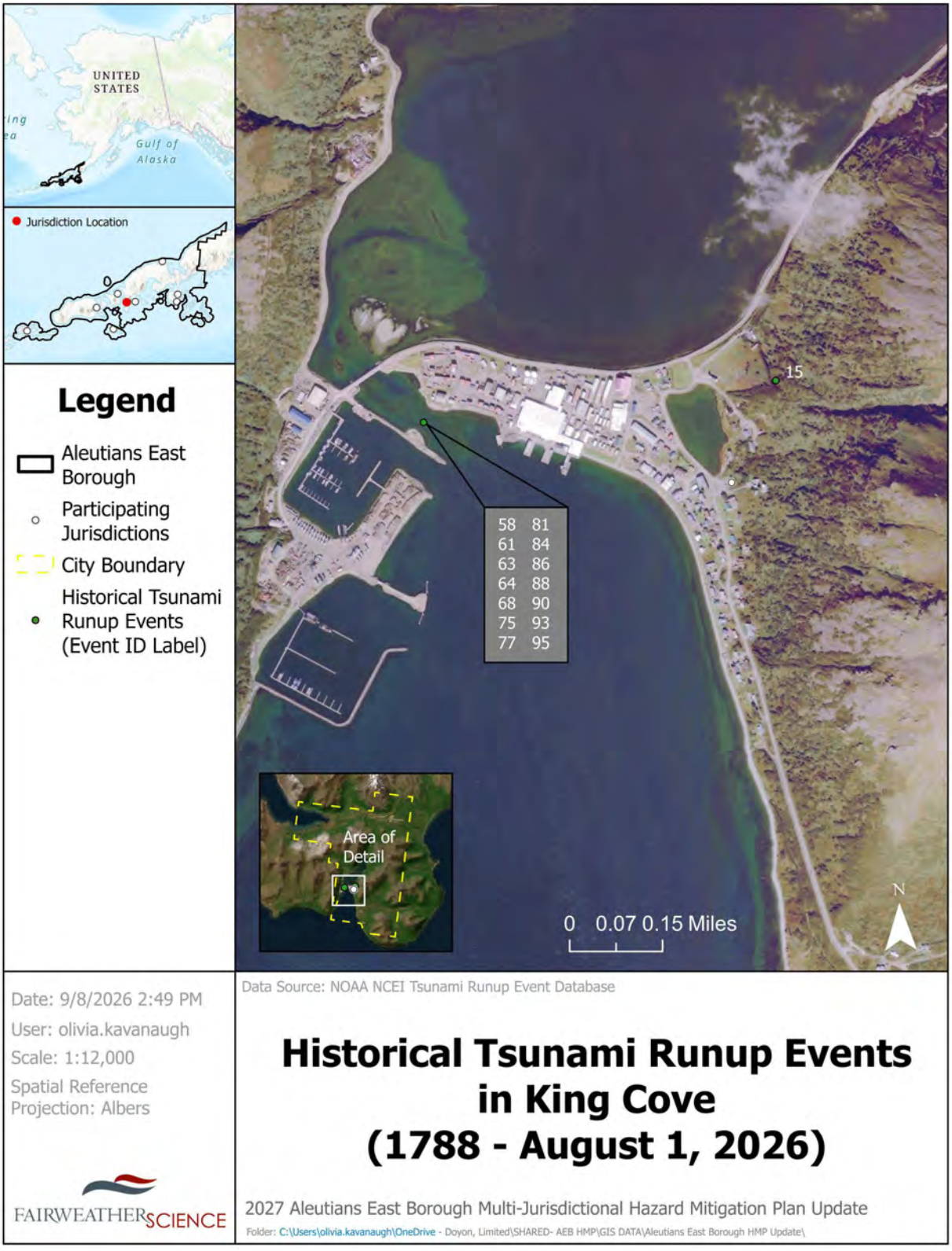



**Figure I-25- Historical Tsunami Runup Events in King Cove (1788 – August 1, 2026)**

#### I.4.1.10.3 Extent (Magnitude and Severity)

The extent of past tsunami events in Belkofski Village (inundation depth) is unknown.

King Cove has experienced tsunami run up events from less than 1 foot to nearly 5 feet. According to the inundation mapping, the maximum inundation of King Cove is over 6 feet.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in the Belkofski Village is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in King Cove is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### I.4.1.10.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | While the Belkofski Village and King Cove are located in a tsunami-prone region, there is little evidence that historical tsunamis have reshaped the community's overall landscape. Changes to the landscape in King Cove from tsunami events tend to be localized as opposed to affecting the entire geography of the area. |
| Infrastructure | While the community hasn't experienced a catastrophic tsunami event impacting infrastructure, Belkofski's and King Cove's infrastructure remain highly vulnerable due to many assets being concentrated near sea-level, where a significant tsunami event can severely damage or destroy critical facilities.<br><br>Critical facilities at risk of tsunami impacts in King Cove include the Alaska Commercial Company, Teen Center, KC Harbor Warehouse, Silver Bay Stock Room, King Cove City Red Shed, King Cove Bible Church, Cemetery, St. Herman Orthodox Church, King Cove Tribe Culture Center, USPS, Department of Public Safety Building, City Hall, Boat Lift, Port Breakwaters, Small Boat Harbor, T dock, Small Boat Harbor Crane Dock, Large Boat Harbor, Mike Uttecht Jr Harbor House, City Fuel Farm, and King Cove Gas Station. |
| People | There are no documented tsunami-related fatalities or significant injuries in Belkofski Village or King Cove. Future injuries or fatalities could occur due to drowning or being struck by strong tsunami waves. |
| Utilities | There are no documented reports of historical tsunamis causing significant damage to Belkofski's or King Cove's utility infrastructure, including its electrical, water, wastewater, or communications systems. Future tsunamis could damage utility infrastructure, which could result in prolonged service disruptions and outages. |
| Economy | There are no recorded economic impacts due to tsunamis in Belkofski Village or King Cove. |
| Transportation | Historically, there are no documented reports of tsunamis causing significant damage to transportation infrastructure in Belkofski Village or King Cove. A significant tsunami could inundate some roadways to and from the airport and in |

| Description of Impact | |
|---|---|
| | an extreme event potentially inundate the runway and airport infrastructure from the south. Aircraft taking off or landing on the water (floatplanes) could be impacted directly by a significant wave causing damage to aircraft and people onboard the aircraft. |
| Subsistence Resources | There have been no recorded instances of a tsunami in Belkofski or King Cove that has impacted the community's access to subsistence resources. |

#### I.4.1.10.5 Probability of Future Events

Based on the community's location, and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Belkofski Village will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

Based on DGGS inundation mapping, and the criteria identified in Table 6 of the Base Plan, it is **Likely** that King Cove will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### I.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in Belkofski Village or King Cove is not anticipated to change in the future. |
| Location | The location of tsunami events in King Cove is not anticipated to change in the future. All low-lying coastal areas in King Cove will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in Belkofski Village or King Cove. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in Belkofski Village or King Cove. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in Belkofski Village or King Cove. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in King Cove, it is possible that future tsunamis will impact future population patterns. Belkofski Village is uninhabited and unlikely to be influenced. Depending on the severity of the event, a tsunami in King Cove could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in King Cove, it is likely that future tsunamis will impact future land use development particularly in coastal areas. Belkofski Village is uninhabited and unlikely to be influenced. If a tsunami event occurs in King Cove, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area Additionally, land use |

| Description of Future Conditions | |
|---|---|
| | development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in Belkofski Village or King Cove. |

### I.4.1.11 Volcano

#### I.4.1.11.1 Location

The entire geography of Belkofski Village and King Cove are vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.

According to the 2023 State of Alaska HMP, Belkofski Village and King Cove are located in a **moderate** volcanic ash hazard level area.

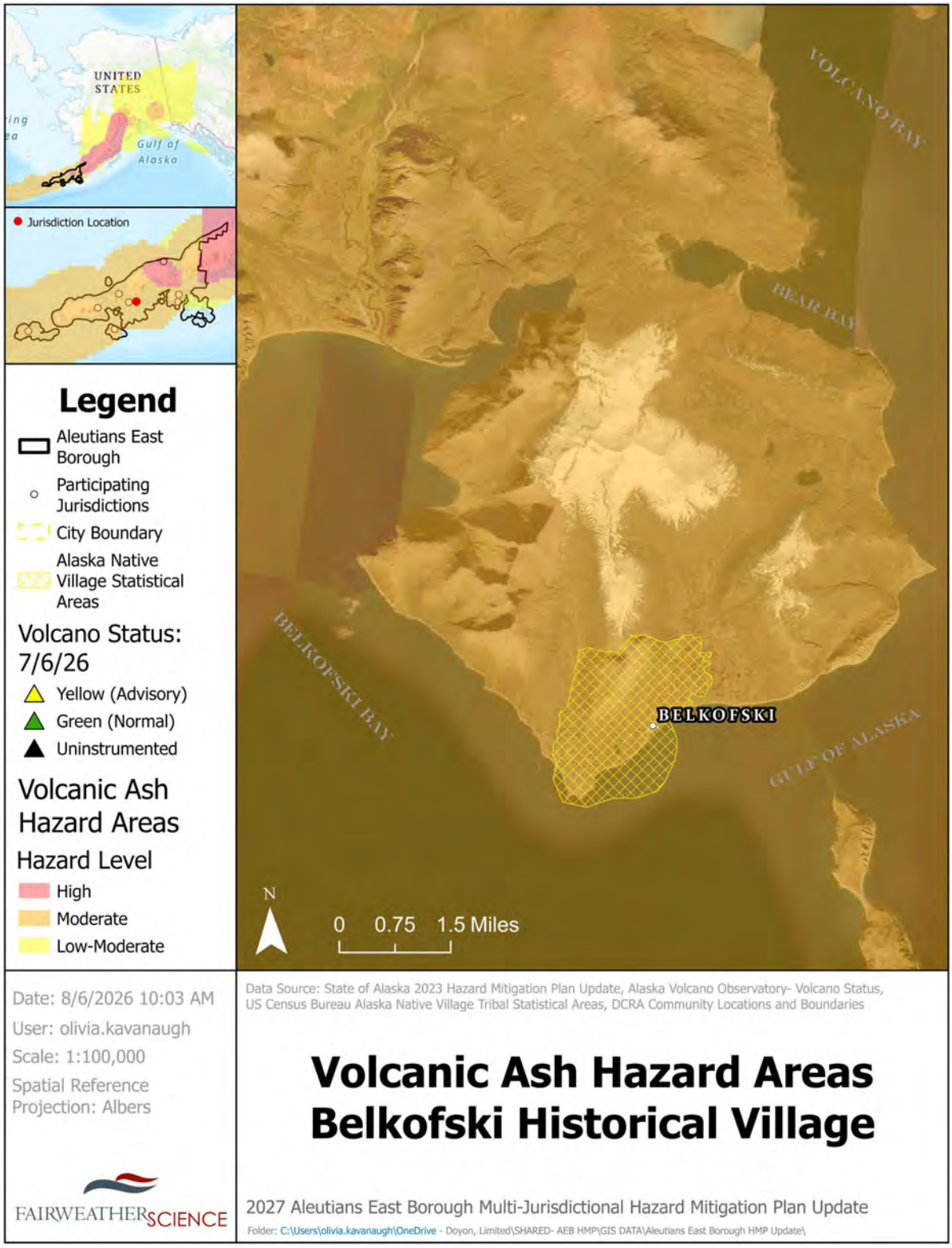



**Figure I-26 – Belkofski Village Volcano Hazard Areas**

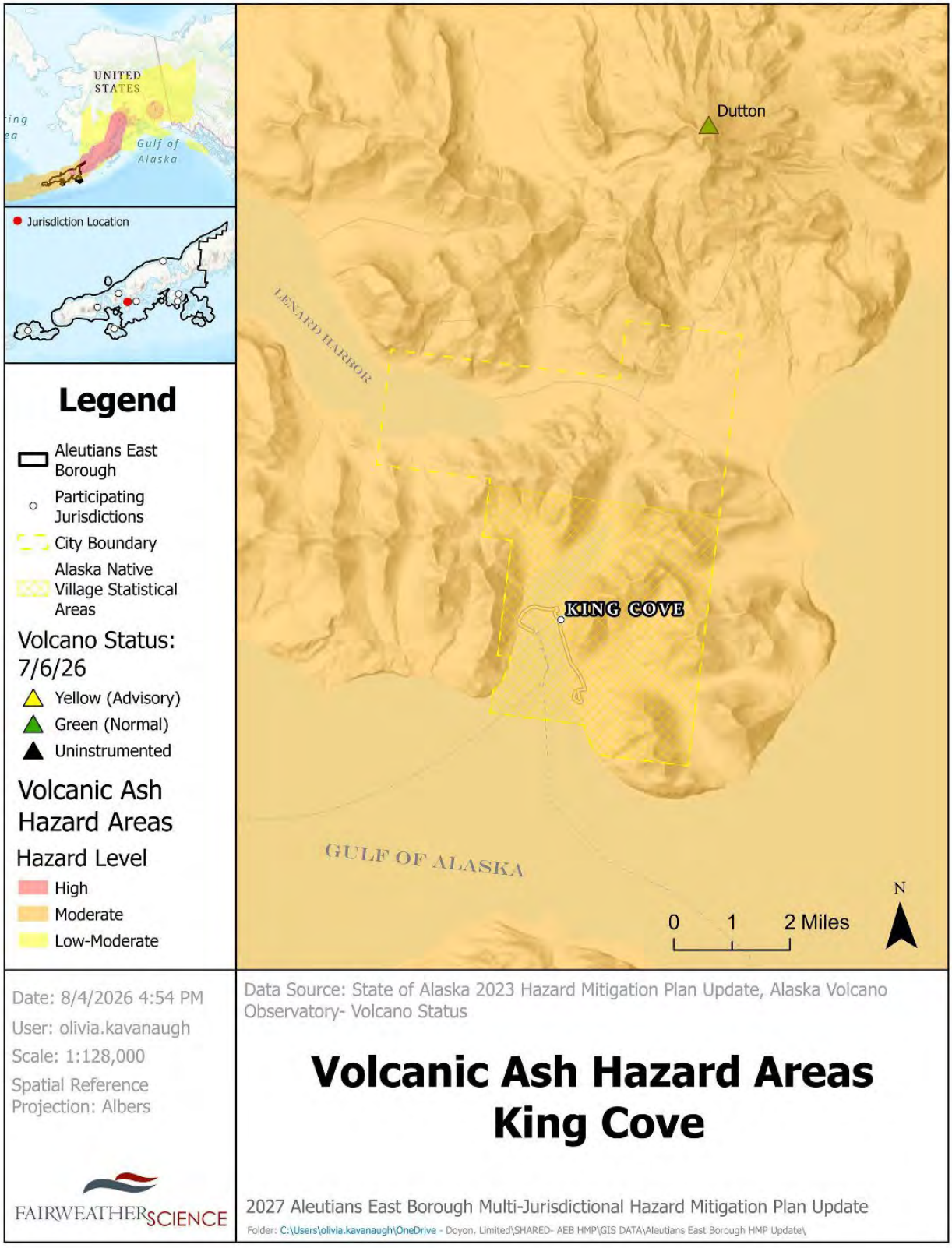



**Figure I-27 – King Cove Volcano Hazard Areas**

#### I.4.1.11.2 History

King Cove has had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to King Cove is **Mount Dutton**, which is approximately 9 miles north of the community. While no volcanic eruption has occurred at Mount Dutton, a 1988 seismic swarm near the volcano resulted in a string of earthquakes being sharply felt at King Cove (AVO 2026).

The volcano that has historically caused the most impacts at King Cove is **Mount Pavlof**. Located approximately 30 miles north of King Cove, Pavlof has erupted a total of 31 times since 1900, with several of them resulting in localized impacts. The eruptions in 1917, 1986, 1996, 2013, and 2014 resulted in light ash fall accumulating in several AEB communities, including King Cove.

**Mount Shishaldin** is a historically active volcano that has resulted in several eruptions that has impacted the AEB, including King Cove. Located approximately 70 miles west of King Cove, Shishaldin has erupted a total of 24 times since 1900. In 2023, it was reported that an eruption from Shishaldin resulted in light ash fall accumulating in King Cove.

While data on historical accounts of volcanoes at Belkofski Village are limited, the area's proximity to King Cove makes it possible that Belkofski Village have experienced impacts from volcanoes such as Mount Shishaldin and Mount Pavlof.

#### I.4.1.11.3 Extent (Magnitude and Severity)

Belkofski Village and King Cove are located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026).

Based on recorded eruptions and data from other surrounding volcanoes, King Cove has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community.

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the historical extent of volcanoes in Belkofski Village is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcanoes in King Cove is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### I.4.1.11.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding King Cove has been ashfall. While most of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposit (USGS 2015).<br>While volcanoes are identified as a concern in Belkofski Village, there is limited data of its impact to the geography and land in the area. |
| Infrastructure | The historical ashfall reported in Belkofski Village and King Cove has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of King Cove from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. |

| Description of Impact | |
|---|---|
| | While volcanoes are identified as a concern in Belkofski Village, there is limited data of its impact to people in the area. |
| Utilities | There have been no documented cases of volcanic eruptions causing utility disruptions in King Cove. While wet ash can cause power outages by coating insulators and transformers, the ashfall in the community from past eruptions have only resulted in trace amounts scattered throughout King Cove (USGS 2015).<br>There are no utilities in Belkofski village that can be impacted by volcanic eruptions. |
| Transportation | The primary transportation related impact from a volcanic eruption in King Cove is aircraft interruptions. Ash clouds from Mount Pavlof's 2016 eruption caused flight delays and cancellations throughout Alaska, including King Cove.<br>While volcanoes are identified as a concern in Belkofski Village, there is limited data of its impact to transportation in the area. |
| Economy | The primary economic related impact from a volcanic eruption in King Cove is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations.<br>While volcanoes are identified as a concern in Belkofski Village, there is limited data of its impact to the economy in the area. |
| Subsistence Resources | While historic impacts to subsistence resources from volcanic eruptions have been minimal, local accounts described the 2023 eruption of Mount Shishaldin impacting the plant and berry growth in Belkofski Village and King Cove. |

#### I.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact King Cove.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 7, it is **Highly Likely** Belkofski will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 7, it is **Highly Likely** King Cove will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### I.4.1.11.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in Belkofski Village or King Cove. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in Belkofski Village or King Cove. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in Belkofski Village or King Cove. |

| Description of Future Conditions | |
|---|---|
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in Belkofski Village or King Cove. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in Belkofski Village or King Cove. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in Belkofski Village or King Cove. |
| Land Use Development | Future climate conditions are not expected to influence land use development in Belkofski Village or King Cove. |
| Subsistence Resources | Future climate conditions are not expected to influence Belkofski Village's or King Cove's ability to access subsistence resources. |

### I.4.1.12 Wildland Fire

The Native Village of Belkofski Planning Team did not select this hazard to profile in the MJHMP Update.

According to LANDFIRE's (Landscape Fire and Resource Management Planning Tools Project) 2025 Alaska Statewide Wildfire Exposure Assessment, the majority of the Belkofski Village and King Cove Planning Area is located in an area that is **Minimally Exposed to Wildfire Hazard**. The population center of King Cove is located in an area that is Infrequently Exposed to Wildfire Hazard (Figure I-28 and Figure I-29).

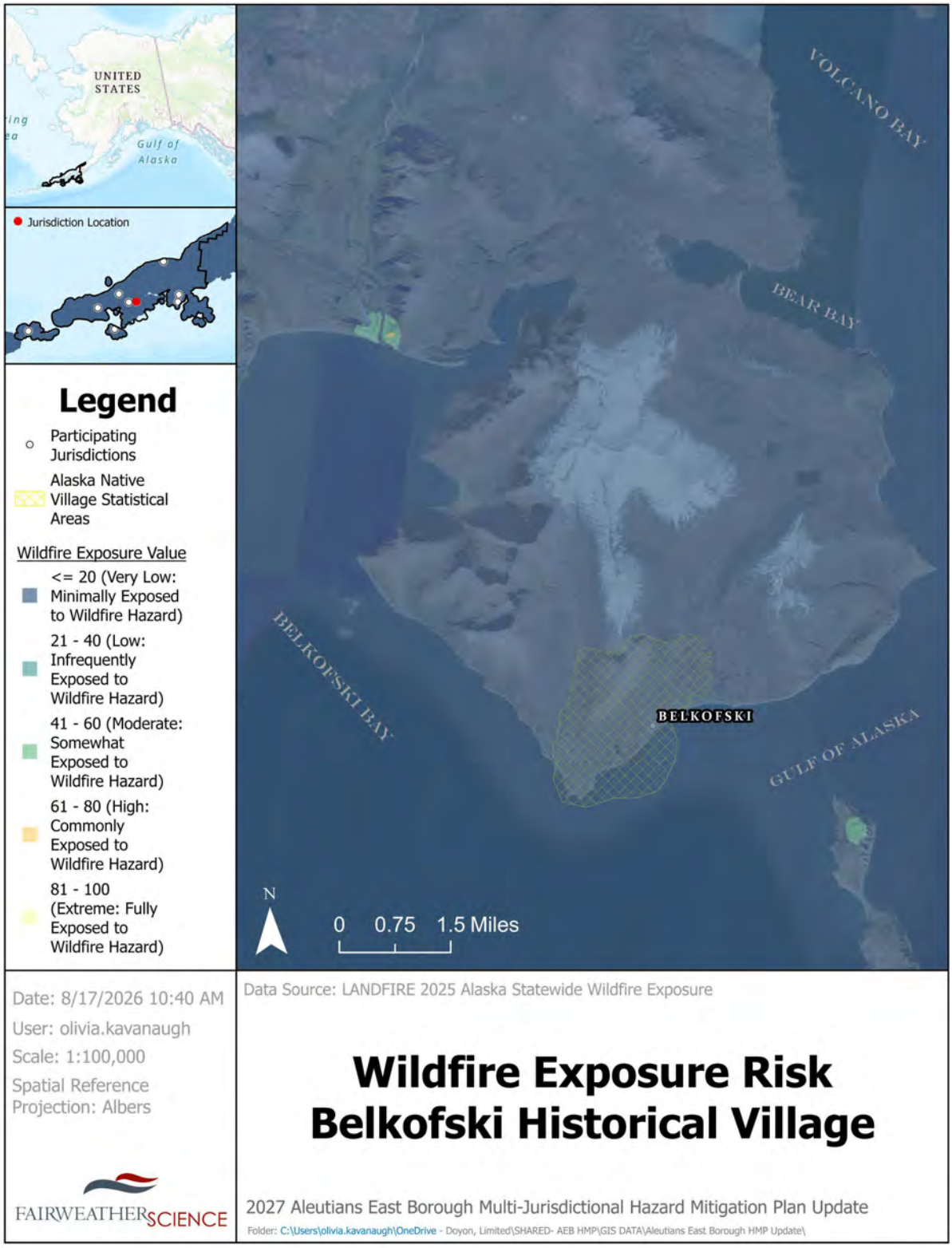



**Figure I-28- Belkofski Village Wildfire Exposure Risk**

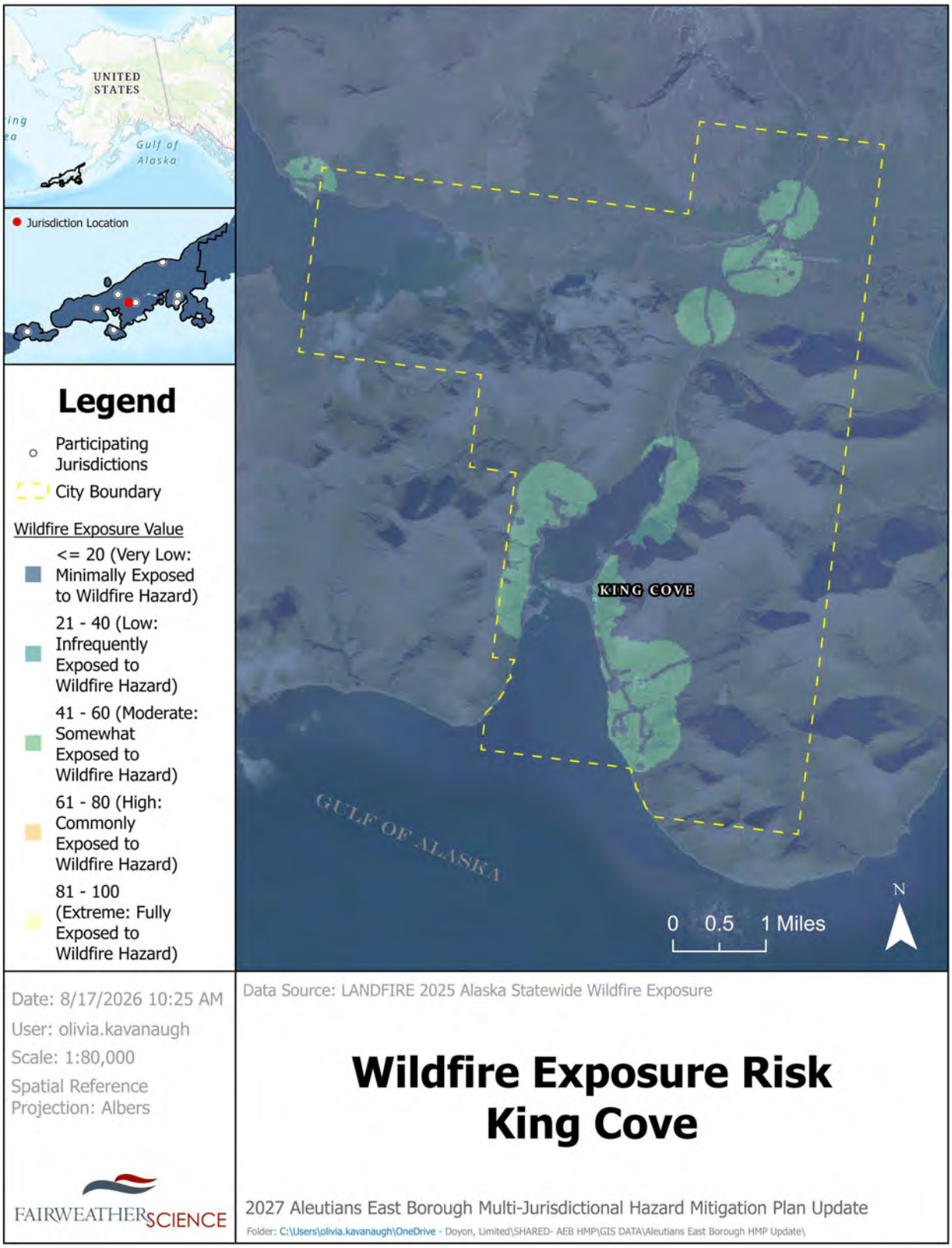
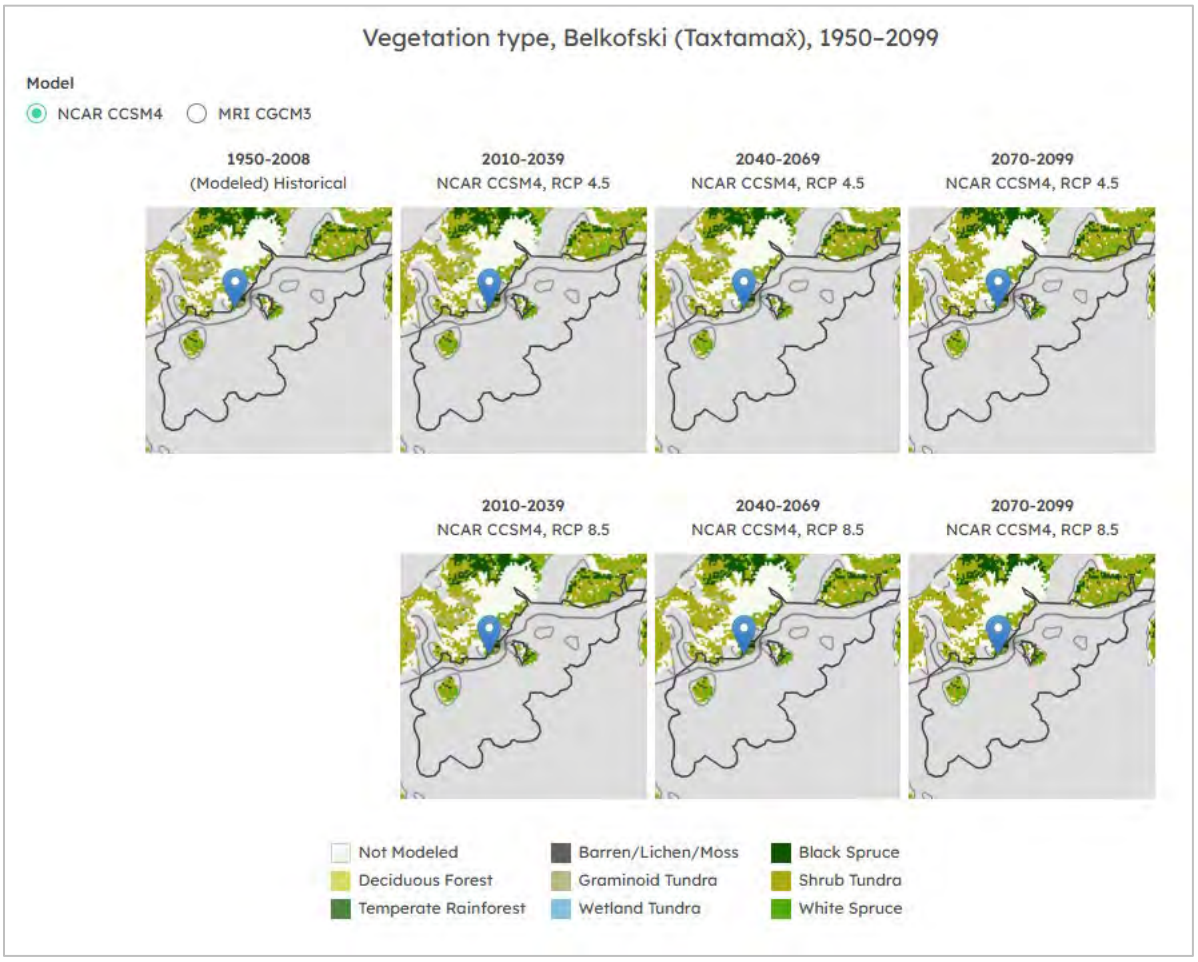



**Figure I-29- King Cove Wildfire Exposure Risk**

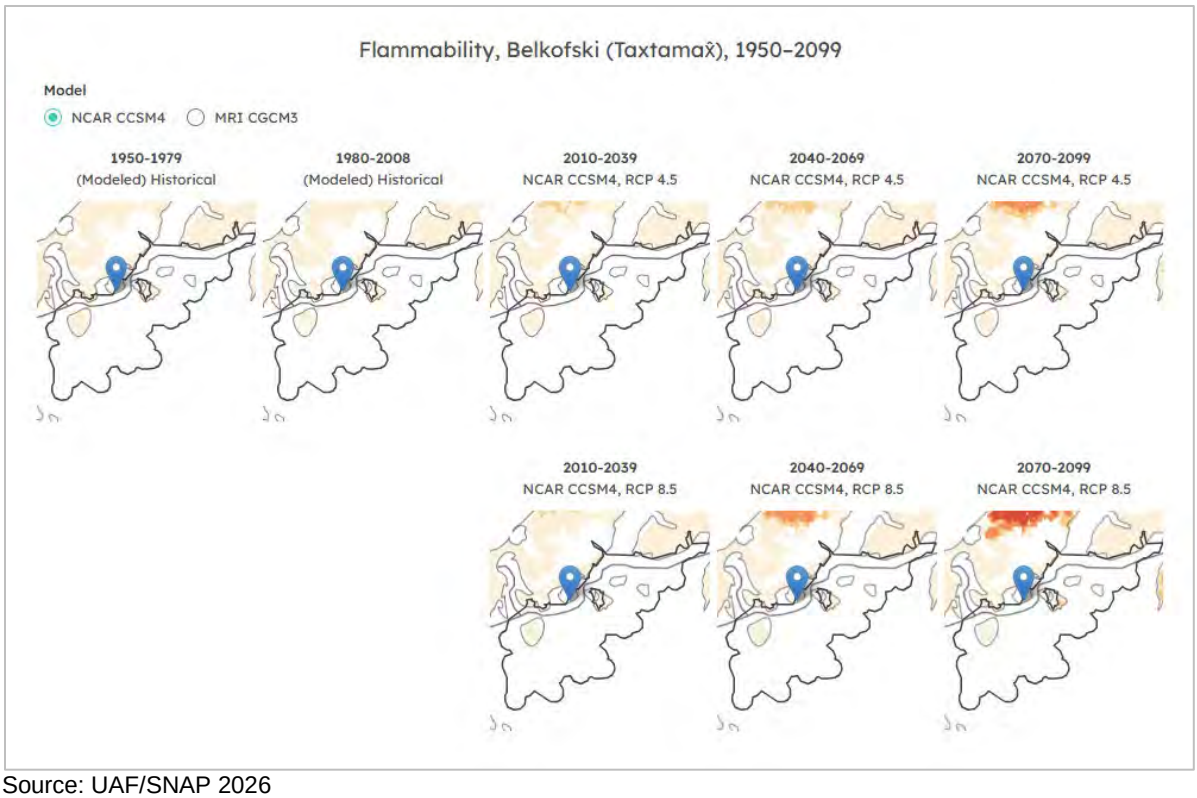
As shown in the figure below, vegetation map modeling is available for Belkofski Village through 2099.




Source: UAF/SNAP 2026

**Figure I-30- Vegetation Type in Belkofski Village, 1950-2099**

The figure below shows modeled changes in flammability through 2099 in and around Belkofski. It does not show areas of heightened flammability in the direct vicinity of Belkofski in the coming decades (UAF/SNAP 2026).




Source: UAF/SNAP 2026

**Figure I-31- Flammability in Belkofski Village, 1950-2099**

## I.4.2 Critical Facilities

**Table I-3- Critical Facilities- Native Village of Belkofski**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Native Village of Belkofski- Historical Village | Community | 0 | Belkofski Cemetery | | 55.086383 | -162.042005 | $1,000,000 | | | | | x | x | | x | x | x | x | x | | | |
| 2 | Native Village of Belkofski- Historical Village | Community | 0 | Hunting cabins (x3) 2 in historical Village site, 1 Corp cabin outside of Village | | Unknown | Unknown | $150,000 | | | | | | x | | x | | x | x | x | | | |
| 3 | Native Village of Belkofski- King Cove | Government | 5 | Tribal Headquarters - Native Village of Belkofski | 338 Squirrel Rd | 55.042340 | -162.299562 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 4 | Native Village of Belkofski- King Cove | Commercial | 20 | Alaska Commercial Company | 401 Harbor Road | 55.05984 | -162.3291 | $5,000,000 | S3 | King Cove Corp | King Cove Corp | | x | x | | x | x | x | x | x | | | |
| 5 | Native Village of Belkofski- King Cove | Commercial | 20 | Teen Center | 122 Ram's Crk Rd | 55.06072 | -162.3146 | $1,221,003 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 6 | Native Village of Belkofski- King Cove | Commercial | 10 | KC Harbor Warehouse (Old Power House) | 407 Harbor Road | 55.06029 | -162.3284 | $1,047,636 | S3 | City | City | | | x | | x | | x | x | x | | | |
| 7 | Native Village of Belkofski- King Cove | Commercial | 10 | Silver Bay Stock room | 402 Harbor Road | 55.05946 | -162.3289 | $500,000 | S3 | King Cove Corp | King Cove Corp | | x | x | | x | x | x | x | x | | | |
| 8 | Native Village of Belkofski- King Cove | Commercial | 0 | King Cove City Red Shed | Park Ave | 55.06039 | -162.3140 | $409,666 | S3 | City | City | | | x | | x | | x | x | x | | | |
| 9 | Native Village of Belkofski- King Cove | Community | 12 | King Cove Bible Church | 107 Ram's Creek Rd | 55.05916 | -162.3111 | $1,200,000 | W2 | Private | Private | | | x | | x | | x | x | x | | | |
| 10 | Native Village of Belkofski- King Cove | Community | 3 | Cemetery | 116 Rams Creek Road | 55.06237 | -162.3117 | $5,000,000 | NA | Unknown | Unknown | | | x | | x | | x | x | x | | | |
| 11 | Native Village of Belkofski- King Cove | Community | 10 | Senior Center | 243 Slocum Dr | 55.04781 | -162.2991 | $2,279,206 | W2 | City | City | | | x | | x | | x | | x | | | |
| 12 | Native Village of Belkofski- King Cove | Community | 30 | The Old School (Multi-Purpose Facility) 43,202 SQFT | 121 Rams Creek Road | 55.04726 | -162.2962 | $2,080,921 | W2 | City | City | | | x | | x | | x | | x | | | |
| 13 | Native Village of Belkofski- King Cove | Community | 5 | St. Herman Orthodox Church | 116 Rams Creek Road | 55.06185 | -162.3124 | $1,000,000 | W2 | Private | Private | | | x | | x | | x | x | x | | | |
| 14 | Native Village of Belkofski- King Cove | Community | 12 | King Cove Tribe Culture Center | 126 Park Ave | 55.05961 | -162.3132 | $1,000,000 | W2 | Non-Profit | Non-Profit | | | x | | x | | x | x | x | | | |
| 15 | Native Village of Belkofski- King Cove | Community | 30 | USPS | 137 Park Avenue | 55.05902 | -162.3133 | $1,000,000 | W2 | King Cove Corp | King Cove Corp | | | x | | x | | x | x | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | Native Village of Belkofski- King Cove | Education | 1000 | King Cove School | 236 Slocum Dr | 55.04737 | -162.2962 | $31,871,802 | S3 | AEB | AEB | | | x | | x | | x | | x | | | |
| 17 | Native Village of Belkofski- King Cove | Emergency Response | 7 | Department of Public Safety 3,402 SQFT | 135 Rams Creek Rd | 55.06069 | -162.3142 | $2,683,653 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 18 | Native Village of Belkofski- King Cove | Government | 6 | Public Works 7,605 SQFT | 339 Ram's Creek Rd | 55.04256 | -162.2968 | $3,623,039 | S3 | City | City | | | x | | x | | x | | x | | | |
| 19 | Native Village of Belkofski- King Cove | Government | 4 | City Hall 1,670 SQFT | 110 Ram's Creek Rd | 55.05952 | -162.3112 | $1,129,471 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 20 | Native Village of Belkofski- King Cove | Medical | 10 | Clinic | 238 Slocum Dr | 55.04849 | -162.2957 | $20,000,000 | W2 | Tribal | Tribal | | | x | | x | | x | | x | | | |
| 21 | Native Village of Belkofski- King Cove | Transportation | 3 | Boat Travel Lift | Harbor Road | 55.05703 | -162.3266 | $1,300,000 | Steel | City | City | | | x | | x | | x | x | x | | | |
| 22 | Native Village of Belkofski- King Cove | Transportation | 0 | Port Breakwaters | King Cove Harbor | 55.05364 | -162.3250 | $50,000,000 | 1.43 miles of stone | City | City | | | x | | x | | x | x | x | | | |
| 23 | Native Village of Belkofski- King Cove | Transportation | 20 | Small Boat Harbor | Harbor Road | 55.05521 | -162.3278 | $50,000,000 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 24 | Native Village of Belkofski- King Cove | Transportation | 3 | T Dock - Small harbor boat | Harbor Road | 55.05854 | -162.3259 | $50,000,000 | Wood | City | City | | | x | | x | | x | x | x | | | |
| 25 | Native Village of Belkofski- King Cove | Transportation | 3 | Small harbor crane dock | Harbor Road | 55.06009 | -162.3264 | $50,000,000 | Metal | City | City | | | x | | x | | x | x | x | | | |
| 26 | Native Village of Belkofski- King Cove | Transportation | 20 | Airport Runway | Airport Road | 55.11629 | -162.2762 | $50,000,000 | Gravel path (3,500 x 115 ft) | State | State | | | x | | | | x | | x | | | |
| 27 | Native Village of Belkofski- King Cove | Transportation | 20 | Large Boat Harbor | Harbor Road | 55.05582 | -162.3231 | $13,260,524 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 28 | Native Village of Belkofski- King Cove | Transportation | 0 | Harbor Bridge | Harbor Rd | 55.06092 | -162.3266 | $10,000,000 | Wood and metal | City | City | | | x | | x | | x | | x | | | |
| 29 | Native Village of Belkofski- King Cove | Transportation | 0 | Delta Creek Bridge East | AEB Route 1 | 55.12155 | -162.2747 | $10,000,000 | Wood and metal | AEB | AEB | | | x | | | | x | | x | | | |
| 30 | Native Village of Belkofski- King Cove | Transportation | 0 | Waterfall Bridge | Waterfall Creek Rd | 55.12538 | -162.2730 | $10,000,000 | Wood and metal | City | City | | | x | | | | x | | x | | x | |
| 31 | Native Village of Belkofski- King Cove | Transportation | 1 | King Cove DOT | 608 Airport Rd | 55.11446 | -162.2744 | $5,000,000 | S3 | State | State | | | x | | | | x | | x | | | |
| 32 | Native Village of Belkofski- King Cove | Transportation | 3 | Mike Uttecht Jr Harbor House 3,600 SQFT | 407 Harbor Road | 55.05677 | -162.3260 | $1,016,303 | W2 | City | City | | | x | | x | | x | x | x | | | |
| 33 | Native Village of Belkofski- King Cove | Utilities | 3 | City Fuel Farm | Harbor Road | 55.06035 | -162.3289 | $10,000,000 | Steel tanks | City | City | | | x | | x | | x | x | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 34 | Native Village of Belkofski- King Cove | Utilities | 2 | Welcome to King Cove Water Tower | Airport Rd | 55.10545 | -162.2903 | $10,000,000 | Steel Tank | City | City | | | x | | | | x | | x | | | |
| 35 | Native Village of Belkofski- King Cove | Utilities | 3 | Powerhouse | 237 Slocum Dr | 55.04813 | -162.2936 | $8,032,348 | S3 | City | City | | | x | | x | | x | | x | | | |
| 36 | Native Village of Belkofski- King Cove | Utilities | 4 | Clear Creek Dam | Delta Creek Rd | 55.13972 | -162.2699 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 37 | Native Village of Belkofski- King Cove | Utilities | 4 | Delta Creek Dam | End of Delta Creek Rd | 55.14010 | -162.2725 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 38 | Native Village of Belkofski- King Cove | Utilities | 3 | Waterfall Creek Dam | Waterfall Drive | 55.11441 | -162.2801 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 39 | Native Village of Belkofski- King Cove | Utilities | 3 | Old Ram's Creek Dam/Water Reservoir | Slocum Dr | 55.05707 | -162.2771 | $5,000,000 | Concrete | City | City | | | x | | | | x | | x | | x | |
| 40 | Native Village of Belkofski- King Cove | Utilities | 2 | Chlorine House | 205 Hillside Dr | 55.04908 | -162.3042 | $5,000,000 | Concrete | City | City | | | x | | x | | x | | x | | | |
| 41 | Native Village of Belkofski- King Cove | Utilities | 1 | Water Reservoir | Unknown | 55.05707 | -162.2771 | $5,000,000 | Metal Dam | City | City | | | x | | | | x | | x | | | |
| 42 | Native Village of Belkofski- King Cove | Utilities | 3 | Land Field | Salmon Berry Dr | 55.03477 | -162.2935 | $5,000,000 | Gravel | City | City | | | x | | x | | x | | x | | | |
| 43 | Native Village of Belkofski- King Cove | Utilities | 1 | AT&T / Fastwyre | Hillside Dr | 55.04939 | -162.3042 | $5,000,000 | Cell Tower | Private | Private | | | x | | x | | x | | x | | | |
| 44 | Native Village of Belkofski- King Cove | Utilities | 1 | GCI Satellite Station | Rams Creek Road | 55.06082 | -162.3144 | $5,000,000 | Cell Tower | Private | Private | | | x | | x | | x | x | x | | | |
| 45 | Native Village of Belkofski- King Cove | Utilities | 2 | Water Treatment Plant 1,914 SQFT | 605 Delta Crk Rd | 55.12342 | -162.2721 | $1,757,290 | S3 | City | City | | | x | | | | x | | x | | | |
| 46 | Native Village of Belkofski- King Cove | Utilities | 12 | King Cove Gas Sation | Harbor Road | 55.05647 | -162.3269 | $506,060 | Steel Tank | City | City | | | x | | x | | x | x | x | | | |
| 47 | Native Village of Belkofski- King Cove | Utilities | 3 | Hydro Intake House/ Clear Creek | Clear Creek | 55.13973 | -162.2699 | $155,708 | S3 | City | City | | | x | | | | x | | x | | x | |
| 48 | Native Village of Belkofski- King Cove | Utilities | 3 | Hydro Intake House/ Glacier Creek | Glacier Creek | 55.14001 | -162.2721 | $155,708 | S3 | City | City | | | x | | | | x | | x | | x | |
| **Total Occupants:** | | | **1317** | **Total Estimated Value:** | | | | **$458,880,338** | | | | | | | | | | | | | | | |




**Figure I-32- Native Village of Belkofski Critical Facilities Map 1 of 4 (Belkofski Village Geography)**

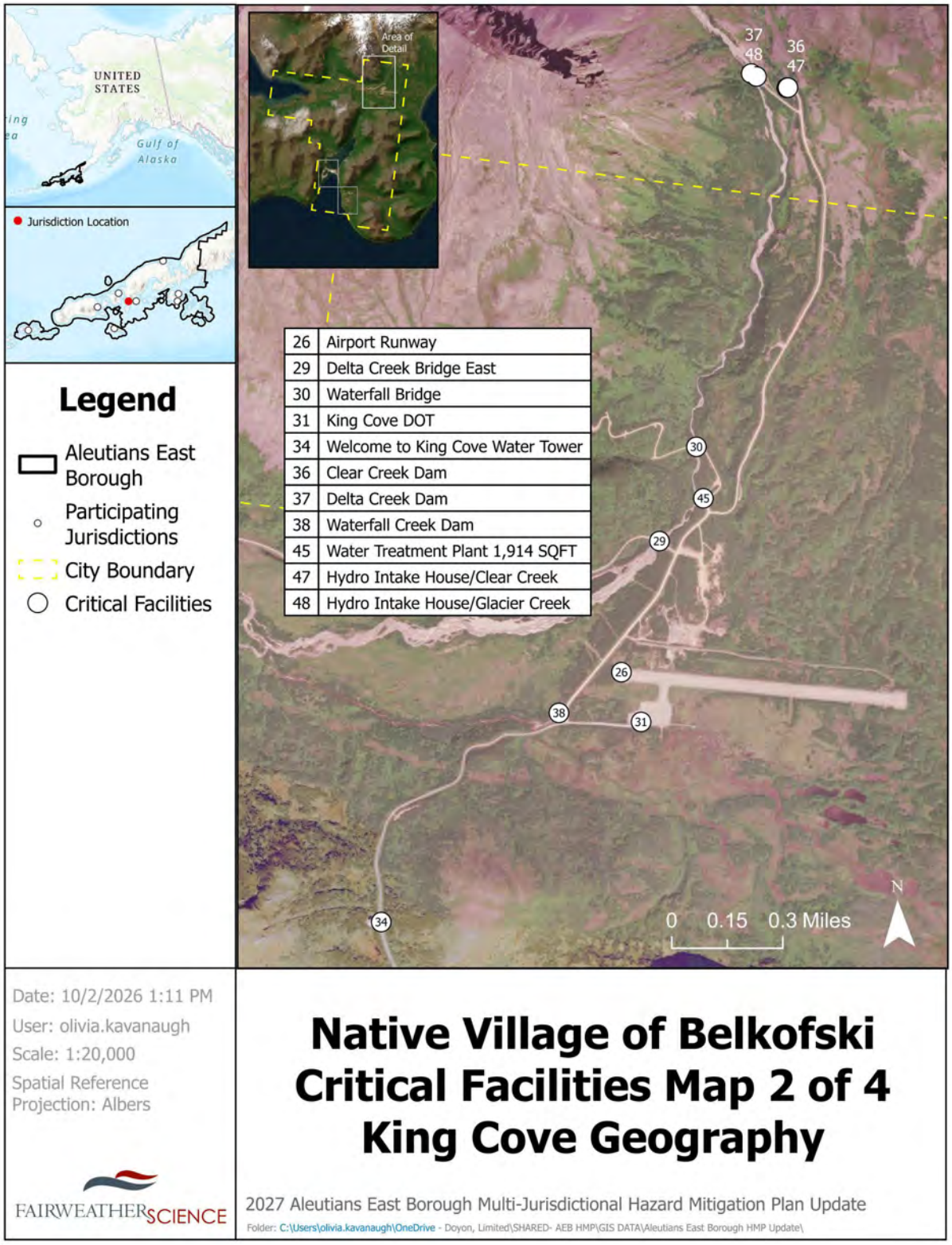



**Figure I-33- Native Village of Belkofski Critical Facilities Map 2 of 4 (King Cove Geography)**

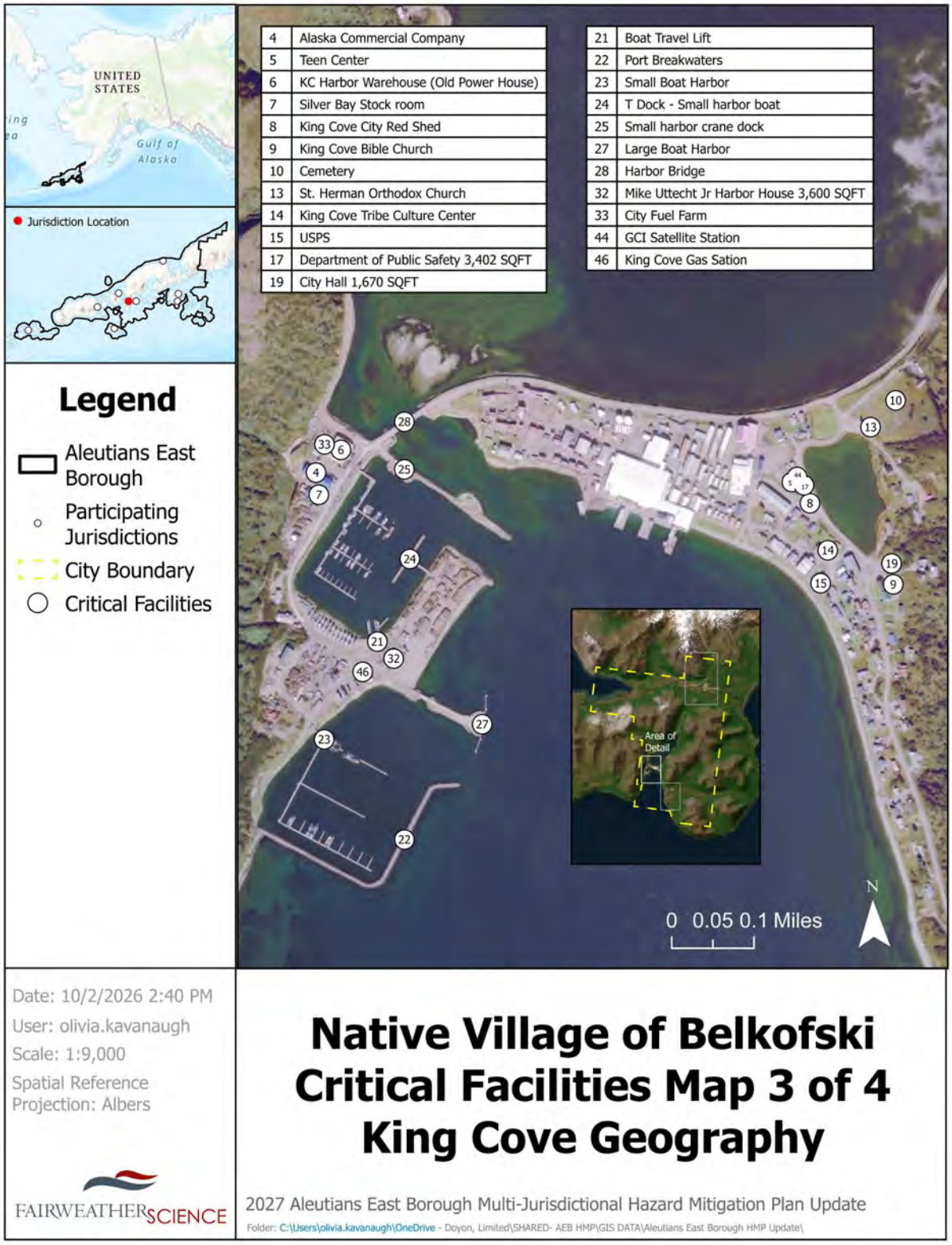



**Figure I-34- Native Village of Belkofski Critical Facilities Map 3 of 4 (King Cove Geography)**

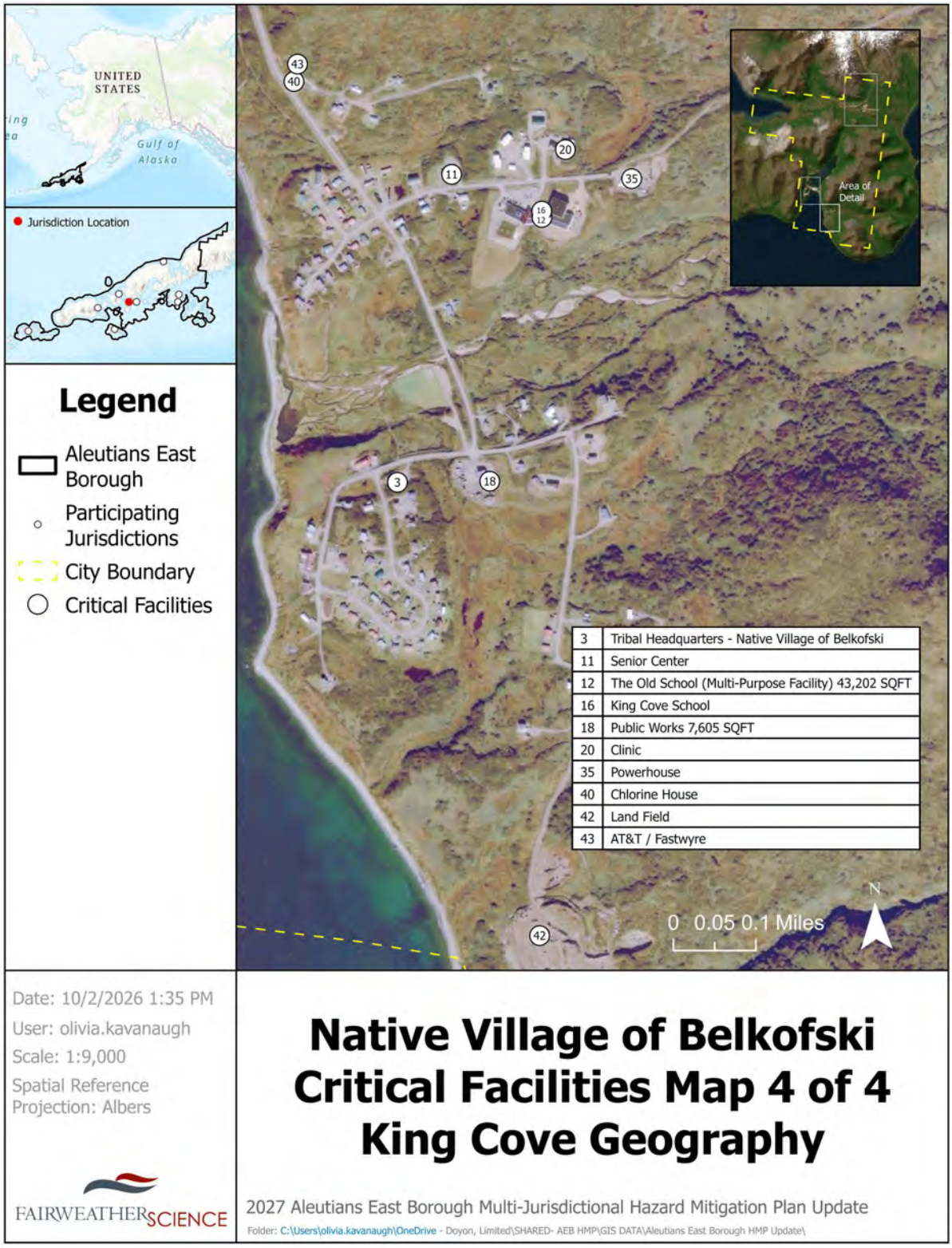



**Figure I-35- Native Village of Belkofski Critical Facilities Map 4 of 4 (King Cove Geography)**

## I.4.3 Summary of Vulnerability

**Table I-4- Jurisdictional Summary of Vulnerability- Native Village of Belkofski- Historical Village**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere-Snow Avalanche | 1 | 0 | $1,000,000 | N/A | N/A | N/A |
| Earthquake | 2 | 0 | $1,150,000 | N/A | N/A | N/A |
| Sediment Deterioration and Land Destabilization | 0 | 0 | $0 | N/A | N/A | N/A |
| Flood | 2 | 0 | $1,150,000 | N/A | N/A | N/A |
| Ground Failure/ Landslide | 1 | 0 | $1,000,000 | N/A | N/A | N/A |
| Severe Weather | 2 | 0 | $1,150,000 | N/A | N/A | N/A |
| Tsunami | 2 | 0 | $1,150,000 | N/A | N/A | N/A |
| Volcano | 2 | 0 | $1,150,000 | N/A | N/A | N/A |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | Did not profile this hazard | | | | | |
| Invasive Species | 0 | 0 | $0 | N/A | N/A | N/A |

The Native Village of Belkofski's vulnerability extends beyond the permanent residential population and built facilities represented in the quantitative assessment above. Although the historic village no longer has year-round residents, the Tribe maintains traditional, cultural, spiritual, and subsistence connections to the ancestral village and surrounding lands. Continued access to those areas supports fishing, hunting, berry gathering, and other subsistence and cultural activities. Hazards that damage traditional routes, beaches, trails, subsistence-use areas, or other cultural resources may therefore affect the Tribe even when no permanent residences or occupied facilities are directly damaged.

**Table I-5- Jurisdictional Summary of Vulnerability- Native Village of Belkofski- King Cove**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere-Snow Avalanche | 2 | 30 | $5,500,000 | 2 | 30 | $5,500,000 |
| Earthquake | 46 | 1317 | $457,730,338 | 46 | 1317 | $457,730,338 |
| Sediment Deterioration and Land Destabilization | Did not profile this hazard | | | | | |
| Flood | 33 | 1271 | $345,661,632 | 178 | 736 | $129,345,657 |
| Ground Failure/ Landslide | 2 | 30 | $5,500,000 | 8 | 32 | $5,799,104 |
| Severe Weather | 46 | 1317 | $457,730,338 | 178 | 736 | $129,345,657 |
| Tsunami | 22 | 201 | $252,274,316 | 70 | 280 | $50,659,632 |
| Volcano | 46 | 1317 | $457,730,338 | 178 | 736 | $129,345,657 |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | Did not profile this hazard | | | | | |
| Invasive Species | 0 | 0 | $0 | 0 | 0 | $0 |

## I.5 Capability Assessment

***Note: the Native Village of Belkofski does not participate in the National Flood Insurance Program (NFIP).***

| Planning and Regulatory Tools | |
|---|---|
| **Plans** | **Existing?** |
| Comprehensive/ Master Plan | No |
| Capital Improvements Plan | No |
| Economic Development Plan | No |
| Emergency Operations Plan or Small Community Emergency Operations Plan | Yes |
| Transportation Plan | Yes |
| Housing Plan | Yes |
| Hazard-specific plans or studies | Yes |
| **Land Use Planning and Ordinances or Practices** | |
| **Ordinance/Practice** | **Existing?** |
| Zoning Ordinance | City of King Cove- Yes, Tribe- No |
| Subdivision Ordinance | City of King Cove - Yes, Tribe- No |
| Building Codes | No |
| Natural Hazard Specific Ordinance or Practices (Stormwater, Steep Slopes, Wildfire) | No |
| Acquisition of Land for Open Space and Public Recreation Uses | No |
| Maintenance Programs to Reduce Risk, E.G., Tree Trimming, Clearing Drainage Systems | No |
| **Administrative and Technical** | |
| **Resource** | **Existing?** |
| Tribal Council/ Governing Body | Yes- Board consisting of 5 Tribal members |
| Tribal Chief Executive | Yes- Board elected president |
| Mitigation Planning Committee | No |
| Business Committees | No |
| Mutual Aid Agreements | No |
| Code Inspector | No |
| Environmental/Natural Resources Specialist | Yes |
| Emergency Manager | No |

| Administrative and Technical | |
|---|---|
| **Resource** | **Existing?** |
| Community Planner | No |
| Housing Specialist | No |
| Engineer | No |
| Historian/ Cultural Advisor | No |
| Financial or Grants Specialist | Yes |
| Administrative Staff Person | Yes |
| Other- IGAP Coordinator | No |
| Warning Systems/ Services | No |
| Hazard Data/Information | No |
| Grant Writing | Yes |
| Geographic Information Systems (GIS) Analysis | No |

| Financial | |
|---|---|
| **Resource** | **Existing?** |
| Capital Improvements Project Funding | Yes |
| Gaming Revenue, Enterprise Revenues | No |
| Fees For Water, Sewer, Gas, or Electric Services | No |
| Fees From Festivals, Campsites, and Recreational Areas | No |
| Permits and Other Fees | No |
| Federal Funding (BIA, HUD) | Yes |
| Contract Services | No |

| Education and Outreach | |
|---|---|
| **Program/Organization** | **Existing?** |
| Gatherings, Festivals, Celebrations and/or Meetings | No |
| Natural Disaster or Safety- Related School Programs | No |
| Fire Safety Programs | No |

The Tribe's continuing use of and knowledge about the historic Belkofski Village and surrounding traditional-use areas provides place-based information relevant to hazard identification, access, and resource vulnerability. Tribal knowledge regarding traditional routes, subsistence-use areas, environmental change, and culturally important places can complement technical hazard information where the available regional data do not fully characterize conditions within the historic village geography.

# I.6 Mitigation Strategy

## I.6.1 Mitigation Goals

The Native Village of Belkofski has identified its goals related to hazard mitigation as:

1. Support community actions that reduce risks to the lives, property, and cultural resources from natural hazards.
2. Protect subsistence resources and access by reducing impacts from natural hazards.
3. Protect critical tribal facilities and cultural resources, including the tribal building, historic trails and buildings, and cemeteries.
4. Improve hazard monitoring and data collection through continued shoreline monitoring, GIS mapping, and environmental assessments.

## I.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

This is the first edition HMP for the Native Village of Belkofski.

As such, there is no previous HMP and no previously identified mitigation actions for the jurisdiction to provide a status update.

Future plan updates will document the status and progress of mitigation actions identified in this HMP.

## I.6.3 2027 Mitigation Action Plan

**Table I-6- 2027 Mitigation Action Plan- Native Village of Belkofski**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | All Hazard | Update inventory of historic trails used in Belkofski village | L | Environmental Department | AK SHPO; NPS; BIA; Denali Commission; USDA RD; FEMA HMA | Plans and Regulations | Historic Trails | 3-4 years | B/C: This project would document historic trails and help preserve information about traditional routes that may also support future planning, cultural resource protection, and emergency access. TF: This project is technically feasible using field surveys, community knowledge, mapping, and available GIS resources. | Existing Plans: SCERP/EOP; Transportation Plan. Future Plans: Comprehensive Plan; Land Use Plan; Transportation Plan; Cultural Resources Plan; Emergency Preparedness Plan |
| **2** | Avalanche | Educate and survey tribal members on avalanche risk | M | Tribal Staff | FEMA EMPG; FEMA HMA; AK DHS&EM; AK DGGS | Education and Awareness Programs | All | 0-2 years | B/C: This project would improve Tribal members' understanding of avalanche hazards and help residents make informed decisions about activities and residences in or near hazard zones. TF: This project is technically feasible using public education materials, surveys, and available avalanche hazard information. | Existing Plans: SCERP/EOP. Future Plans: Emergency Preparedness Plan; Public Information/Outreach Plan; Comprehensive Plan; Land Use Plan |
| **3** | Dam Failure | Coordinate with City to incorporate dam safety info into public outreach | L | Environmental Department | FEMA EMPG; FEMA HMA; FEMA HMGP; AK DHS&EM; USACE; AK DNR; Denali Commission | Education and Awareness Programs | All | 3-4 years | B/C: Incorporating dam safety information into public outreach would improve community awareness of potential dam failure hazards and appropriate protective actions. TF: This project is technically feasible through coordination with the City and use of existing dam safety and emergency preparedness information. | Existing Plans: SCERP/EOP. Future Plans: Dam Safety Plan; Emergency Response Plan; Public Information/Outreach Plan; Comprehensive Plan |
| **4** | Earthquake | Establish earthquake event exercises for tribal members, as well as incorporating earthquake safety tips in public announcements | H | Environmental Department | FEMA EMPG; FEMA HMA; AK DHS&EM; AK Earthquake Center/UAF | Education and Awareness Programs | All | 0-2 years | B/C: This project would improve earthquake preparedness among Tribal members by providing opportunities to practice appropriate response actions and reinforcing earthquake safety information. TF: This project is technically feasible using established emergency exercise procedures and State and Federal earthquake preparedness guidance. | Existing Plans: SCERP/EOP. Future Plans: Emergency Preparedness Plan; Public Information/Outreach Plan; School Emergency Operations Plan; Comprehensive Plan |
| **5** | Earthquake | Install earthquake straps on heavy/tall furniture in tribal housing to reduce the potential of damage/injuries during an earthquake. | H | Environmental Department | FEMA HMA; FEMA HMGP; FEMA EMPG; AK DHS&EM; USDA RD | Structure and Infrastructure Projects | Tribal Housing | 3-4 years | B/C: This project would reduce the potential for injuries and property damage by securing heavy and tall furniture before an earthquake. TF: This project is technically feasible using commercially available earthquake straps and established securing methods. | Existing Plans: SCERP/EOP; Housing Plan. Future Plans: Emergency Preparedness Plan; Continuity of Operations Plan; Facilities Management Plan; Comprehensive Plan |
| **6** | Flood | Coordinate with City, Borough, and State to improve roadside drainage to flood-prone roadways such as W Lagoon Rd and other roads that are susceptible to coastal flooding | M | Environmental Department | FEMA HMA; FEMA HMGP; FEMA FMA; FHWA PROTECT; AK DOT&PF; USACE; AK DEC; Denali Commission | Structure and Infrastructure Projects | Roads | 3-4 years | B/C: Improving roadside drainage would reduce localized flooding and help maintain access along roads vulnerable to coastal flooding. TF: This project is technically feasible using established engineering practices and coordination with City, Borough, and State agencies. | Existing Plans: SCERP/EOP; Transportation Plan. Future Plans: Stormwater/Drainage Plan; Capital Improvement Plan; Comprehensive Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **7** | Ground Failure/Landslide | Install more landslide barriers in high hazard areas | M | Environmental Department | FEMA HMA; FEMA HMGP; USACE; AK DGGS; Denali Commission | Structure and Infrastructure Projects | All | 5-10 years | B/C: This project would reduce the potential for landslide impacts to people, infrastructure, and property by providing additional protection in high-hazard areas. TF: This project is technically feasible using established slope stabilization and barrier construction methods but may require site-specific engineering and permitting. | Existing Plans: SCERP/EOP. Future Plans: Comprehensive Plan; Land Use Plan; Environmental Plan; Capital Improvement Plan |
| **8** | Invasive Species | Conduct periodic invasive plant surveys surrounding Belkofski Village and upload results into AKEPIC database. | L | Environmental Department | USFWS; USDA; AK DEC; AKEPIC; FEMA EMPG | Plans and Regulations | N/A | 0-2 years | B/C: This project would improve understanding of invasive plant populations and help identify areas where management actions may be needed to protect the local environment. TF: This project is technically feasible using established survey methods and the AKEPIC database for documenting invasive plant occurrences. | Existing Plans: SCERP/EOP. Future Plans: Environmental Plan; Natural Resources Plan; Public Information/Outreach Plan; Comprehensive Plan |
| **9** | Invasive Species | Conduct periodic invasive slug surveys at Belkofski Village | H | Environmental Department | USDA; USFWS; AK DEC; ADF&G; FEMA EMPG | Plans and Regulations | N/A | 0-2 years | B/C: This project would improve understanding of invasive slug populations and help inform future efforts to reduce their spread and impacts in Belkofski Village. TF: This project is technically feasible using established survey methods and periodic monitoring. | Existing Plans: SCERP/EOP. Future Plans: Environmental Plan; Natural Resources Plan; Public Information/Outreach Plan; Comprehensive Plan |
| **10** | Land Destabilization | Conduct a coastal land destabilization assessment of Belkofski Village, particularly the nearby creeks | L | Environmental Department | FEMA HMA; FEMA HMGP; NOAA; USGS; AK DGGS; USACE; Denali Commission | Plans and Regulations | All | 5-10 years | B/C: This project would identify areas of coastal land destabilization around Belkofski Village and nearby creeks and help prioritize future monitoring and mitigation efforts. TF: This project is technically feasible using field assessments, mapping, and available technical expertise. | Existing Plans: SCERP/EOP. Future Plans: Comprehensive Plan; Land Use Plan; Environmental Plan; Natural Resources Plan; Capital Improvement Plan |
| **11** | Severe Weather | Conduct inventory and install hardware to prevent roof damage from storms | H | Lynn | FEMA HMA; FEMA HMGP; USDA RD; Denali Commission; AK DHS&EM | Structure and Infrastructure Projects | All | 3-4 years | B/C: This project would reduce potential roof damage and help protect tribal facilities from severe storms by identifying vulnerable areas and installing appropriate protective hardware. TF: This project is technically feasible using commercially available hardware and established building protection methods. | Existing Plans: SCERP/EOP; Housing Plan. Future Plans: Emergency Preparedness Plan; Facilities Management Plan; Capital Improvement Plan; Continuity of Operations Plan |
| **12** | Severe Weather | Conduct assessment on vulnerable facilities and buildings related to high wind events | H | Tribal staff | FEMA HMA; FEMA HMGP; USDA RD; Denali Commission; AK DHS&EM | Plans and Regulations | All | 3-4 years | B/C: This project would identify facilities and buildings vulnerable to high wind events and help prioritize measures to reduce potential damage and service disruptions. TF: This project is technically feasible using established facility assessment methods and technical assistance as needed. | Existing Plans: SCERP/EOP. Future Plans: Emergency Preparedness Plan; Facilities Management Plan; Capital Improvement Plan; Comprehensive Plan |
| **13** | Tsunami | Conduct tsunami vulnerability assessment on facilities located in the inundation zone | L | Environmental Department | FEMA HMA; FEMA HMGP; NOAA NTHMP; AK DGGS; AK DHS&EM; USACE; Denali Commission | Plans and Regulations | All | 5-10 years | B/C: This project would identify facilities vulnerable to tsunami inundation and help prioritize future mitigation measures to reduce potential damage and service disruptions. TF: This project is technically | Existing Plans: SCERP/EOP. Future Plans: Tsunami/Emergency Evacuation Plan; Emergency Preparedness Plan; |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | feasible using existing tsunami inundation maps, facility information, and technical assistance. | Comprehensive Plan; Capital Improvement Plan |
| **14** | Tsunami | Coordinate with DGGS/AEC to request formal tsunami inundation mapping for Belkofski Village to determine tsunami risk | L | Environmental Department | NOAA NTHMP; FEMA HMA; FEMA HMGP; AK DGGS; AK DHS&EM; AK Earthquake Center/UAF | Plans and Regulations | All | 3-4 years | B/C: Formal tsunami inundation mapping would improve understanding of tsunami risk in Belkofski Village and help inform evacuation planning and future mitigation actions. TF: This project is technically feasible through coordination with DGGS, AEC, and other technical agencies using established tsunami modeling methods. | Existing Plans: SCERP/EOP. Future Plans: Tsunami/Emergency Evacuation Plan; Emergency Preparedness Plan; Comprehensive Plan; Land Use Plan |
| **15** | Volcano | Prepare home kits to protect tribal member health and vehicles from ash fall | M | Environmental Department | FEMA EMPG; FEMA HMA; USGS/AVO; AK DHS&EM; AK DEC; ANTHC | Education and Awareness Programs | Homes | 0-2 years | B/C: This project would provide Tribal members with supplies to protect their health and vehicles from ashfall and reduce potential impacts during an ashfall event. TF: This project is technically feasible using commercially available protective supplies and established ashfall preparedness guidance. | Existing Plans: SCERP/EOP; Housing Plan. Future Plans: Emergency Preparedness Plan; Public Information/Outreach Plan; Continuity of Operations Plan |

### I.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

All projects considered by the Planning Team were selected for inclusion in the 2027 Mitigation Action Plan.

# I.7 Plan Update

## I.7.1 Changes in Development, including in Hazard-Prone Areas (current and future)

### I.7.1.1 Changes in Development Since 2021

While Belkofski Village continues to be used as a seasonal fish camp, little development has occurred since the last permanent residents left in 1982.

There has been little development in King Cove between 2021 and 2026, and the community's overall vulnerability to natural hazards has not significantly changed. In January 2024, Peter Pan closed their seafood processing plant in King Cove, which was the company's largest processing plant.

### I.7.1.2 Future/Planned Development

No future development is currently planned for Belkofski Village.

Future development in King Cove includes construction of the King Cove to Cold Bay Road, a major transportation project that will provide a roadway connection to the Cold Bay Airport and improve access to regional services and emergency transportation.

This planned development is not anticipated to substantially increase or decrease King Cove's overall vulnerability to natural hazards; however, erosion is a potential concern associated with development and road construction. Disturbance of soils and vegetation, changes in drainage patterns, and increased runoff could contribute to localized erosion, particularly in areas susceptible to coastal or stormwater-related erosion.

## I.7.2 Changes in Priorities and Mitigation Efforts

As this is the Native Village of Belkofski' s first HMP, there are no previous mitigation priorities or efforts against which to identify changes.

The priorities and mitigation efforts established in this HMP represent the jurisdiction's initial approach to hazard mitigation. Future plan updates will document changes in priorities and mitigation efforts based on changes in hazard conditions, community needs, capabilities, and implementation progress.

# I.8 Plan Maintenance

## I.8.1 Planning Team MJHMP Maintenance Commitment

The Native Village of Belkofski is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.7.

The Native Village of Belkofski is committed to annually reviewing the Plan and Tribal staff will work to complete their review responsibilities.

## I.8.2 Continued Public Involvement

The Native Village of Belkofski is dedicated to continued public involvement over the next five years.

The Native Village of Belkofski will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2031.

Future engagement should also provide opportunities for Tribal citizens and other community knowledge holders to identify new local observations, environmental changes, subsistence-related impacts, traditional access concerns, and other knowledge relevant to hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where Indigenous Knowledge or other community-provided information is considered for incorporation into the MJHMP, appropriate attention should be given to Tribal review, attribution, sensitivity, and preferences regarding public disclosure.

## I.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The Native Village of Belkofski jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The Tribal Administrator will be responsible for coordinating and facilitating the annual review each year.**

### I.8.3.1.1 Implementing

Upon adoption of the Plan, The Native Village of Belkofski will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The Borough will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

### I.8.3.1.2 Monitoring

The Native Village of Belkofski will monitor the progress of mitigation actions on an annual basis. The Tribal Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

### I.8.3.1.3 Evaluating

The Native Village of Belkofski will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

Annual reviews should also consider whether new Indigenous Knowledge, local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

#### I.8.3.1.4 Updating

The Native Village of Belkofski will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.7. The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Future plan updates should provide opportunities for the Native Village of Belkofski to identify local knowledge, subsistence practices, resource-sharing relationships, and other community-based systems that contribute to hazard preparedness and resilience, while allowing the Tribe to determine what information is appropriate for inclusion in the public plan.

Figure I-36 provides a visual of the HMP plan maintenance activities per year.

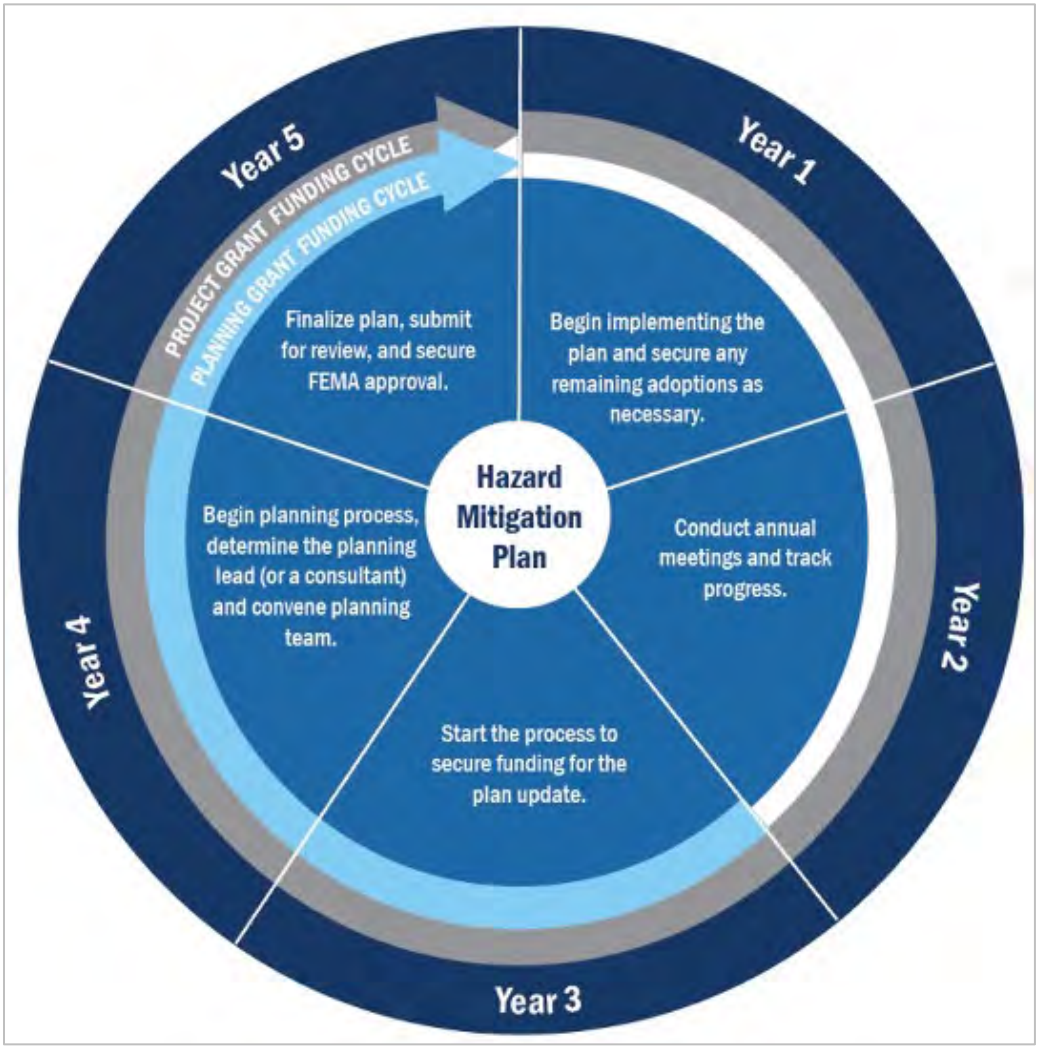



**Figure I-36- HMP Update Schedule**

## I.8.4 Plan Integration

The Native Village of Belkofski will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other Tribal planning and implementation processes, when appropriate, including other FEMA programs and initiatives.

The Tribe will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the Tribe's comprehensive and land use planning processes, economic development planning, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects as well as the upcoming APIA Regional Adaptation Plan.

As the plan is implemented, The Native Village of Belkofski will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## I.9 Plan Adoption

The Belkofski Tribal Council formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

### I.9.1 Tribal Assurances

The Native Village of Belkofski assures that the Tribal Planning Team and Tribal Council will comply with applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding (including 2 CFR Parts 200 and 3002) and will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes.

[insert signed adoption resolution]

# J. City of Sand Point



Photo Credit: KTOO

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# J.1 Planning Team

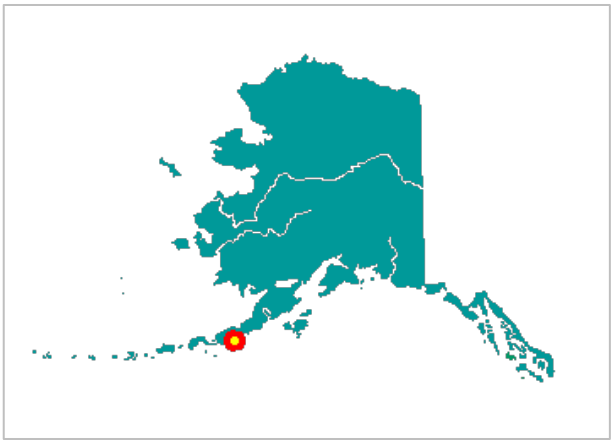
## J.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Debi Schmit** | City Administrator |
| **Dylan Jacobsen** | City Clerk |
| **Julius Karlsen** | Public Works Director |
| **Jasmine Saunders** | EMS Director |
| **Ben Allen** | Police Chief |
| **Mike Franklin** | Superintendent |
| **Jack Foster, Jr.** | Council Member |
| **James Smith** | Administration |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

# J.2 Community Profile

## J.2.1 Location and Geography

Sand Point is a coastal community in southwestern Alaska, in the Aleutian Chain, located on the northwestern portion of Popof Island in the Shumagin Islands group. Sand Point is part of the Aleutians East Borough and serves as the borough seat. The community is located approximately 570 air miles southwest of Anchorage (AEB 2026).



Sand Point is situated on Humboldt Harbor along the northern shore of Popof Island, with Popof Strait separating the island from neighboring Unga Island to the west. The community's island setting places it near the transition between the Alaska Peninsula and the Aleutian Island chain, with the Pacific Ocean surrounding the Shumagin Islands.

The surrounding landscape is characteristic of the maritime environment of the Aleutian region. Popof Island is naturally treeless, with vegetation consisting primarily of alder and willow shrubs, alpine tundra, grasses, sedges, mosses, and wildflowers. The island supports abundant wildlife, including numerous species of seabirds, bald eagles, and marine mammals. The surrounding waters and sheltered harbor also provide important habitat for salmon and other marine species.

Sand Point has a distinctly maritime climate, influenced by its location in the North Pacific. State of Alaska community data identifies average annual precipitation of approximately 33 inches and average snowfall of about 52 inches, with temperatures historically ranging from approximately -9°F to 76°F. The island's exposed coastal position contributes to frequent weather changes and strong marine influence.

The community is isolated from Alaska's major population centers. There is no road connection to the Alaska mainland; transportation is by air and sea. Sand Point has a state-owned airport with a paved runway and regular flights to Anchorage, while its harbor supports commercial fishing vessels, cargo barges, and ferry service.

## J.2.2 History

The history of Sand Point is closely tied to the Unangaŷ people, commercial fishing, and the development of the maritime economy of the Shumagin Islands. The region has been inhabited by Unangaŷ people for thousands of years, and the broader Aleutians East Borough has a long history of subsistence hunting, fishing, and maritime travel.

The modern community of Sand Point developed in the late nineteenth century as commercial fishing expanded into the Shumagin Islands. Sources differ slightly on the precise founding date: the Aleutians East Borough identifies 1898 as the founding of Sand Point by a San Francisco fishing company, which established the community as a trading post and cod-fishing station.

The first residents included Unangaŷ people from surrounding communities and Scandinavian fishermen who came to work in the developing commercial fishing industry. During the late 1800s and early 1900s, Sand Point became an important supply and service location for vessels operating in the surrounding waters. The community also became associated with other resource industries, including fox farming and gold mining**.** Gold mining activity was particularly significant during the early 1900s, when Sand Point served as a repair and supply center for miners.

Commercial fishing remained the foundation of the community as the local economy developed. By the 1930s, fish processing had become Sand Point's dominant economic activity. The construction of the Saint Nicholas Chapel in 1933 reflected the community's growing permanence; the Russian Orthodox church remains an important historic structure and is listed on the National Register of Historic Places. In 1946,

Aleutian Cold Storage constructed a halibut-processing plant, further strengthening Sand Point's position as a regional fishing center.

Sand Point also became increasingly established as a year-round community during the twentieth century. A school was constructed in 1965, and the community was incorporated as a city in 1966. The development of local infrastructure, schools, fishing facilities, and transportation allowed Sand Point to transition from a seasonal fishing and trading station into a permanent community.

The community's importance increased further with the establishment of the Aleutians East Borough in 1987. Sand Point became the borough seat and remains the location of the borough's primary administrative offices. Today, Sand Point continues to be heavily dependent on commercial fishing and seafood processing and is home to one of the largest commercial fishing fleets in the Aleutian region.

Sand Point's history therefore reflects the broader history of southwestern Alaska: an area with a long-standing Unangaŷ presence that was transformed by Russian and American commercial activity, followed by the growth of fishing, fish processing, mining, and other resource-based industries. Despite its remote location, Sand Point developed into an important regional economic and governmental center because of its sheltered harbor, access to productive fishing grounds, and strategic position along the Alaska Peninsula and Aleutian maritime routes.

## J.2.3 Population

Sand Point is a small, predominantly coastal community located on Popof Island in the Aleutians East Borough. The 2024 American Community Survey (ACS) 5-year estimates report a population of approximately 1,064 residents within the city. The 2020 Census counted 578 residents within the incorporated city limits, while the broader Sand Point Alaska Native Village Statistical Area (ANVSA) had a larger population, reflecting differences in geographic boundaries used for demographic reporting.

Sand Point's population is relatively diverse and includes a substantial Alaska Native population. The 2020 Census reported 342 residents identifying as American Indian or Alaska Native alone, compared with 111 identifying as White alone and 53 as Asian alone. Historical demographic data also indicate that the community's population has been closely associated with the commercial fishing industry and the broader maritime economy of the Alaska Peninsula and Aleutian region.

The community's small population and geographic isolation are important considerations for hazard mitigation planning. A limited local population can constrain the availability of emergency personnel, specialized equipment, and other response resources, while severe weather, transportation disruptions, or other hazards may limit access to outside assistance. Population characteristics, including residents requiring transportation, medical, sheltering, or other assistance, should therefore be considered when developing mitigation, preparedness, response, and recovery strategies.

## J.2.4 Demographics

Sand Point has a relatively diverse population with a substantial Alaska Native presence. The 2024 American Community Survey (ACS) 5-year estimates indicate a median age of approximately 42.3 years**,** which is older than both the Aleutians East Borough and Alaska overall. The community has approximately 442 households, with an average household size of about 2.1 persons.

Educational attainment varies within the community. Approximately 90 percent of adults age 25 and older have completed high school or higher**,** while approximately 18 percent have attained a bachelor's degree or higher**.** About 9.6 percent of the population is foreign-born, and Census data indicate that a portion of households speak languages other than English at home.

Economic conditions are also relevant to hazard mitigation planning. The 2024 ACS estimates Sand Point's median household income at approximately $81,600, with approximately 14.9 percent of residents living below the poverty level**.** Approximately 6.3 percent of the population are veterans.

Sand Point's demographic characteristics should be considered when developing hazard mitigation, preparedness, response, and recovery strategies. Older residents, lower-income households, individuals with disabilities or medical needs, residents with limited transportation options, and households with

language or communication barriers may require additional assistance during emergencies. The community's relatively small population and geographic isolation may also affect the availability of local response resources and access to outside assistance.

## J.2.5 Economy

Sand Point's economy is strongly dependent on commercial fishing and seafood processing**,** which are the primary economic activities in the Aleutians East Borough. Sand Point is home to the largest fishing fleet in the Aleutian Chain**,** and commercial fishing supports employment and income for residents as well as businesses providing fuel, transportation, marine repair, supplies, lodging, and other services.

Seafood processing is also a major component of the local economy. Alaska Department of Labor data reported 2,801 seafood-processing workers in the Aleutians East Borough in 2023**,** with approximately $102.5 million in seafood-processing wages. While these figures apply to the entire borough rather than Sand Point alone, they demonstrate the importance of the seafood industry to the regional economy.

Sand Point's economy also includes government, transportation, retail, health services, marine services, and other small businesses that support residents and the fishing industry. The community experiences seasonal economic fluctuations associated with fishing and seafood processing, with population and employment increasing during periods of high fishing and processing activity. The City of Sand Point identifies multiple commercial fisheries, including salmon, halibut, cod, pollock, and crab, as important to the community.

Economic conditions are important considerations for hazard mitigation planning because Sand Point's dependence on maritime transportation and fisheries creates potential vulnerabilities to severe weather, coastal hazards, sea ice, transportation disruptions, infrastructure damage, and changes in fishery operations**.** Disruptions to the harbor, processing facilities, transportation systems, utilities, or fishing activities could affect employment, household income, local businesses, food and fuel supplies, and municipal revenues. The community's geographic isolation may also increase the time and cost required to obtain replacement equipment, supplies, and outside assistance following a disaster.

Subsistence harvesting also contributes to household food supplies and complements Sand Point's strong economic and cultural relationship with fisheries and marine resources.

## J.2.6 Land Use

Land use in Sand Point is strongly influenced by the community's coastal location, fishing-based economy, limited developable land, and geographic isolation. Sand Point is located on Popof Island and encompasses approximately 7.8 square miles of land and 21.1 square miles of water. The developed portion of the community is concentrated around the harbor, downtown area, residential neighborhoods, airport, and other community facilities, while substantial areas outside the built-up portion remain largely undeveloped.

Land ownership on Popof Island is a combination of City-owned, private, and Alaska Native corporation lands, with Shumagin Corporation identified as the primary landowner in and around Sand Point. The harbor area includes both City and Shumagin Corporation lands and serves as a major center for commercial fishing, marine transportation, seafood processing, and related activities.

Within the city, land uses are regulated through the City of Sand Point zoning ordinance. Zoning districts include single-family residential, multifamily residential, manufactured housing, general and neighborhood commercial, light and heavy industrial, boat harbor expansion, open space, and sensitive lands. The zoning ordinance is intended to promote appropriate land use, orderly community growth, public safety, adequate infrastructure, and provision of utilities and public facilities.

The community's waterfront and harbor are particularly important to local land use and economic activity. Commercial fishing and fish processing are dominant uses of the surrounding tidelands, while the harbor provides facilities for fishing vessels, cargo, and passenger transportation. Sand Point also has an airport and transportation infrastructure that connects the community to regional markets and services.

Land use patterns are important to hazard mitigation planning because development is concentrated in areas where coastal hazards, severe weather, flooding, erosion, and transportation disruptions may affect

multiple community functions simultaneously. Critical facilities, residential areas, commercial properties, transportation infrastructure, and waterfront industrial uses may experience cascading impacts when a hazard affects the harbor, airport, roads, utilities, or other essential infrastructure. Future development and redevelopment should consider known hazard areas, infrastructure capacity, emergency access, and the potential effects of climate and environmental changes.

## J.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following jurisdictional-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **2010, 2021 Aleutians East Borough Hazard Mitigation Plans** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **1970 Sand Point Comprehensive Plan** | Provides details on the history, economy, land use, critical facilities, and transportation in Sand Point. | Used relevant information to develop the Community Profile. |
| **1977 City of Sand Point Comprehensive Plan** | | |
| **City of Sand Point Alaska 1981 Comprehensive Plan** | | |
| **2004 City of Sand Point Comprehensive Community Development Plan** | | |
| **2003 Harbor Land Use Plan for Sand Point Alaska** | Lays out a strategy for improving and expanding the city's harbor by organizing land and leases and adding off-loading and storage capacity. | Used to analyze the harbor's vulnerability to natural hazards. |

# J.4 Risk Assessment

## J.4.1 Hazards

The City of Sand Point Planning Team identified the following natural hazards that may impact their geography/community.

✓ Hazard profiled for this jurisdiction in the MJHMP Update
X Hazard not profiled for this jurisdiction in the MJHMP Update

X Changes in the Cryosphere- Sea Ice
X Changes in the Cryosphere- Snow Avalanche
✓ Dam Failure
✓ Earthquake
✓ Flood
X Ground Failure/Landslide
✓ Invasive Species
✓ Sediment Deterioration and Land Destabilization
✓ Severe Weather
✓ Tsunami
✓ Volcano
X Wildland Fire

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere- Sea Ice | Did not profile this hazard. | | |
| Cryosphere- Snow Avalanche | Did not profile this hazard. | | |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap. The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and Sand Point itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 2- Possible | 2- Limited | Sediment deterioration and land destabilization can occur throughout Sand Point, with coastal land destabilization being the biggest concern for the community. Since Sand Point is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline. |
| Flood | 3- Likely | 4- Catastrophic | The Planning Team reports that low-lying waterfront areas in Sand Point have experienced coastal flooding, storm surge, and high tides. |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | The Planning Team reports that low-lying waterfront areas are most impacted by storm events. |
| Ground Failure/ Landslide | Did not profile this hazard. | | |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of Sand Point is susceptible to severe weather events and impacts. The Planning Team reports experiencing coastal storms, dense fog, and high winds. |
| Tsunami | 3- Likely | 3- Critical | According to FEMA's National Risk Index, the tsunami risk for Sand Point is Relatively Moderate. According to the State of Alaska DHS&EM, Sand Point has local tsunami potential and a medium risk of distant tsunami potential. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of Sand Point is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Aleutian volcanos.<br>Volcanic ashfall is the primary volcanic hazard that may impact Sand Point |
| Wildland Fire | 2- Possible | 2- Limited | The State of Alaska rates Sand Point as having relatively low risk of wildland fires. There is no recorded history of wildland fires in Sand Point. |
| Dam Failure | 2- Possible | 3- Critical | There are two (2) Significant Hazard Potential Dams in Sand Point.<br>Humboldt Creek Reservoir Dam and New England Fish Co Dam, located in Sand Point, have no history of dam failure.<br>Formal dam failure inundation mapping is not available for either dam. |
| Invasive Species | 3- Likely | 2- Limited | Invasive species pose a potential threat to the ecological, economic, and cultural resources of Sand Point and surrounding Popof Island. The community's reliance on marine transportation, air travel, fishing, and freight creates pathways for invasive plants, insects, wildlife, and marine organisms to be introduced through contaminated cargo, equipment, vessels, and fishing gear. Once established, invasive species could displace native species, alter wildlife and marine habitats, affect subsistence and commercial fisheries, and increase costs associated with monitoring and control. |

### J.4.1.1 Changes in the Cryosphere- Sea Ice

The City of Sand Point Planning Team did not select this hazard to be profiled in the MJHMP update.

### J.4.1.2 Changes in the Cryosphere- Snow Avalanche

The City of Sand Point Planning Team did not select this hazard to be profiled in the MJHMP update.

### J.4.1.3 Dam Failure

#### J.4.1.3.1 Location

There are two dams located in the city limits of Sand Point. Both dams are classified as having Significant Hazard Potential. These dams are the Humboldt Creek Reservoir Dam, and the New England Fish Co Dam. These dams are profiled below.

| NID ID #AK00268 Humbolt Creek Reservoir Dam | |
|---|---|
| Hazard Classification | Significant |
| Owner | City of Sand Point |
| Year Built | Unknown |
| Dam Type | Earth |
| Dam Purpose | Water Supply |
| Length x Height | 395 ft x 19 ft |
| Drainage Area | 4.7 square miles |
| Inspection Frequency | The most recent inspection date is January 21, 2022. The dam is inspected every three years. |
| Downstream Description | There are four culverts in the dam embankment that drain water from the dam, creating a stream that flows into the ocean. Approximately 800 feet downstream of the dam outflow, Humboldt Creek widens to almost 300 feet when reaching the tidal zone. The downstream area is treeless and compromised of tundra plants and low-lying brush. |
| Downstream Area | The Humboldt Creek Reservoir Dam downstream area contains industrial/commercial property, both primary and secondary roads, utilities, and a small boat harbor. |
| Downstream Dams | There are no dams immediately downstream of the Humboldt Creek Reservoir Dam. |
| Downstream Bridges | There are two bridges downstream of the Humboldt Creek Reservoir Dam. One is a pedestrian bridge and a vehicle bridge. The vehicle bridge is on Sand Point Rd, and the pedestrian bridge connects the small boat harbor to the northern peninsula across from the small boat harbor. Airport Road also crosses over the top of the dam. |
| Reservoir Area | The maximum impoundment volume is 55 acre feet, with a reservoir maximum storage surface area of 11 acres. The reservoir is approximately 800 feet long and 360 feet wide. |
| Downstream Development | Sand Point lies approximately 0.4 miles to the west of the dam. In the tidal zone, which is approximately 250 yards beyond the dam outflow, is a large amount of development. There is Sand Point Rd and bridge, the Robert E. Galovin Small Boat Harbor and its pedestrian bridge. There is also the Trident Seafoods Processing plant. |
| Overall assessment of the 2022 inspection | At the time of the most recent inspection, the condition assessment of the dam was rated as Poor**.** The primary reason for the designation was due to a crack in the earthen embankment and buckling of culverts that run through the dam embankment. These are likely due to recent earthquakes occurring in the vicinity of Sand Point. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026, Terra Firma Testing 2022

| NID ID #AK00122 New England Fish Co Dam | |
|---|---|
| Hazard Classification | Significant |
| Owner | Shumagin Corporation |
| Year Built | 1940 |
| Dam Type | Earth |
| Dam Purpose | Water Supply |
| Length x Height | 283 ft x 10 ft |
| Drainage Area | Unknown |
| Inspection Frequency | The most recent inspection is unknown. Inspection frequency is every 5 years. |
| Downstream Description | New England Fish Co Dam is located approximately 0.6 miles from Popof Straight, where the outflow creek terminates after crossing underneath the Sand Point Airport. |
| Downstream Area | The New England Fish Co Dam structure discharges into its outflow creek. The creek flows through a narrow, deep canyon before up against the Sand Point Airport and discharging in Popof Straight. The drainage canyon is heavily brushed with no infrastructure. There is the Old Reservoir to Red Cove Trail to the south of the outflow creek and several unnamed access trails to the north of the access creek. They meet at the top of the dam. |
| Downstream Dams | There are no dams immediately downstream of New England Fish Co Dam. |
| Downstream Bridges | There is one (1) bridge downstream of New England Fish Co Dam. The outflow creek flows up against the east side of the Sand Point Airport runway and then turns south and crosses under a trail bridge. Additionally, there is a motorized trail that runs across the top of the dam. |
| Reservoir Area | New England Fish Co dam has a maximum capacity of 105-acre feet and a surface area of 8.5 acres. The reservoir is approximately 1000 feet long and 580 feet wide. |
| Downstream Development | The major downstream development of New England Fish Co Dam is the Sand Point Airport. The runway butts against the outflow creek, where it then turns sharply parallel to the runway. The airport terminal and support structures are located on the northeast side of the runway, and these structures are protected from potential inundation due to Arch Rock and the surrounding hill between the infrastructure and the outflow creek. |
| General findings of the most recent inspection | A preliminary inspection by the State of Alaska Dam Safety Engineer, based on observations, rated the dam in **Unsatisfactory** Condition. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. Potential inundation of Sand Point Airport runway and Old Reservoir to Red Cove Road could delay or prohibit air transportation to and from Sand Point. |
| Recommended Hazard Potential Classification | The State of Alaska Dam Safety Engineer has recommended classifying this dam as having Significant Hazard Potential. Due to the proximity to the airport, other downstream development and potential loss of life, this recommendation is accurate and justified based on current classification guidelines. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026

#### J.4.1.3.2 History

There is no record of historical dam failure in Sand Point.

Both dams have damage that has been observed. Humboldt Creek Reservoir Dam has damage to its outflow culverts and a large crack in the earthen embankment resulting from several high magnitude earthquakes (Terra Firma Testing 2022). New England Fish Co Dam has been observed to have seepage issues (State of Alaska Dam Safety Engineer 2026).

#### J.4.1.3.3 Extent (Magnitude and Severity)

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

Potential inundation area was assumed to extend 1 mile downstream from the dams, and 0.1 miles in either direction of the outflow route.

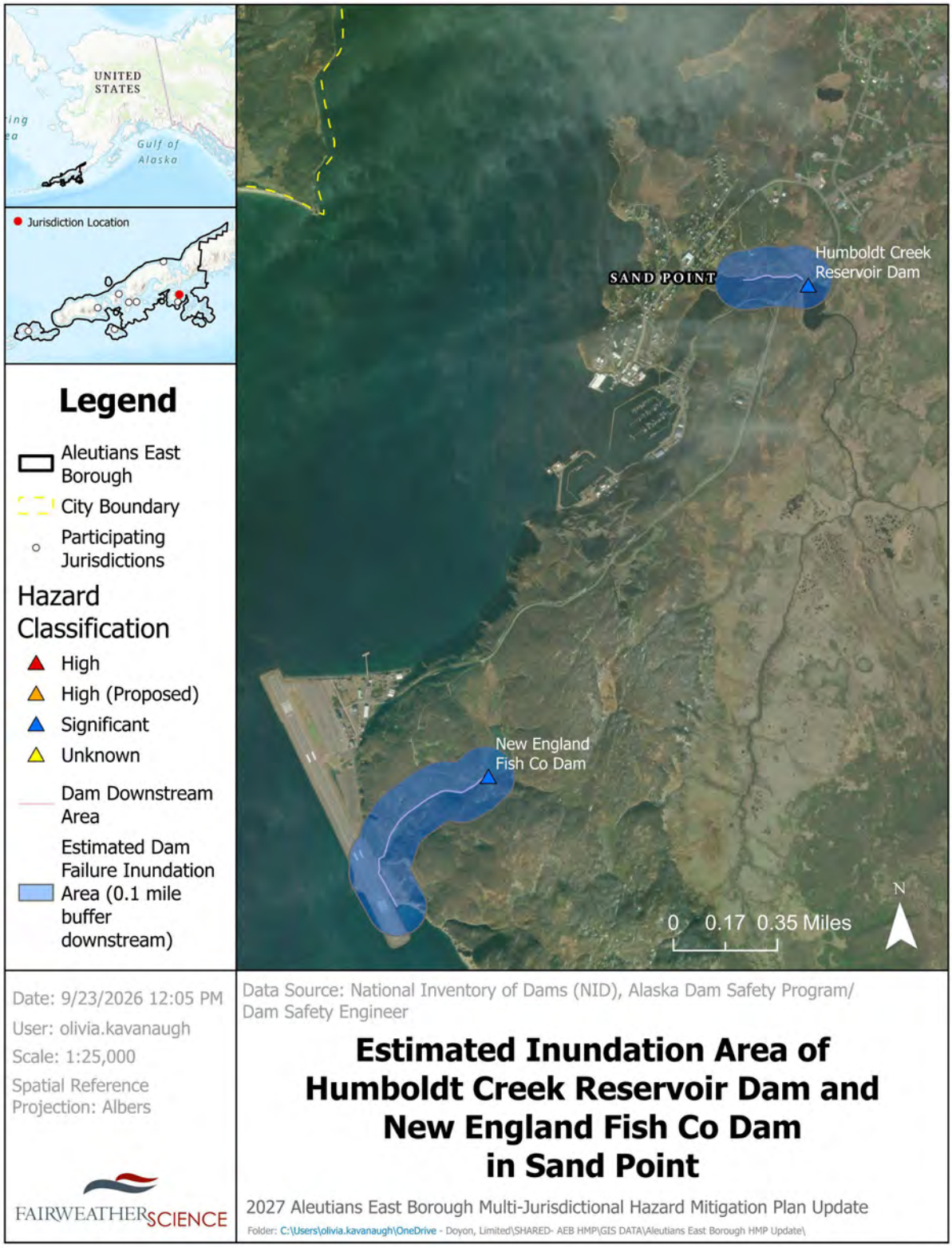



**Figure J-1- Potential Inundation Area of Humboldt Creek Reservoir Dam and New England Fish Co Dam in Sand Point**

Based on estimated inundation area and the criteria identified in Table 5 of the Base Plan, the magnitude and severity of dam failure in Sand Point is **Critical** with multiple deaths and severe injuries; medium shutdown of some critical infrastructure and facilities; 20% to 50% of residential and 10-25% of commercial structures are severely damaged; and large impacts to local operations for long amounts of time

#### J.4.1.3.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | The City of Sand Point Planning Team did not report specific previous impacts related to dam failure in this category. |
| Infrastructure | Humboldt Creek Reservoir Dam presumably damaged from earthquakes in the last 6 years. The City of Sand Point also cites damage to the city dock and numerous culverts as being previously damaged by earthquakes. Critical facilities at risk of dam inundation include the Salmon Hatchery, Aquaculture Building, Volunteer Fire Department Building, City Pump House, two Water Tanks, Humboldt Creek Reservoir Dam, and New England Fish Co Dam. |
| People | The City of Sand Point Planning Team did not report specific previous impacts related to dam failure in this category. |
| Utilities | The City of Sand Point Planning Team did not report specific previous impacts related to dam failure in this category. |
| Transportation | The City of Sand Point Planning Team did not report specific previous impacts related to dam failure in this category. |
| Economy | There are no recorded economic impacts from dam failure in Sand Point. |
| Subsistence Resources | The City of Sand Point Planning Team did not report specific previous impacts related to dam failure in this category. |

#### J.4.1.3.5 Probability of Future Events

Based on the criteria listed in Table 6 of the Base Plan and the most recent condition assessments, it is **Possible** that Sand Point will experience a dam failure event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

However, the State of Alaska Dam Safety Engineer warned of “condition creep”, where observational assessments have rated dams more poorly than their most recent available condition rating. If dams in Sand Point continue to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### J.4.1.3.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in Sand Point. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in Sand Point. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in Sand Point. A potential outcome of changing climate in Alaska is an |

| Description of Future Conditions | |
|---|---|
| | increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in Sand Point. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in Sand Point. Increased precipitation and frequency of severe weather events could contribute to more stress on dams in the Sand Point Planning Area. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in Sand Point as residents may relocate in and out of potential future inundation areas. Residents of Sand Point may also relocate out of the area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in Sand Point. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted in inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in Sand Point.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes.

### J.4.1.4 Earthquake

#### J.4.1.4.1 Location

The entire geography of Sand Point is vulnerable to earthquakes, due to its location on the Alaska-Aleutian subduction zone.

According to the 2023 State of Alaska HMP, Sand Point is located in an area with the potential of severe perceived shaking from earthquakes (PGA 34 – 65). Perceiving shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. This map focuses on the actual variations in shaking intensity across a region as felt by people and structures.

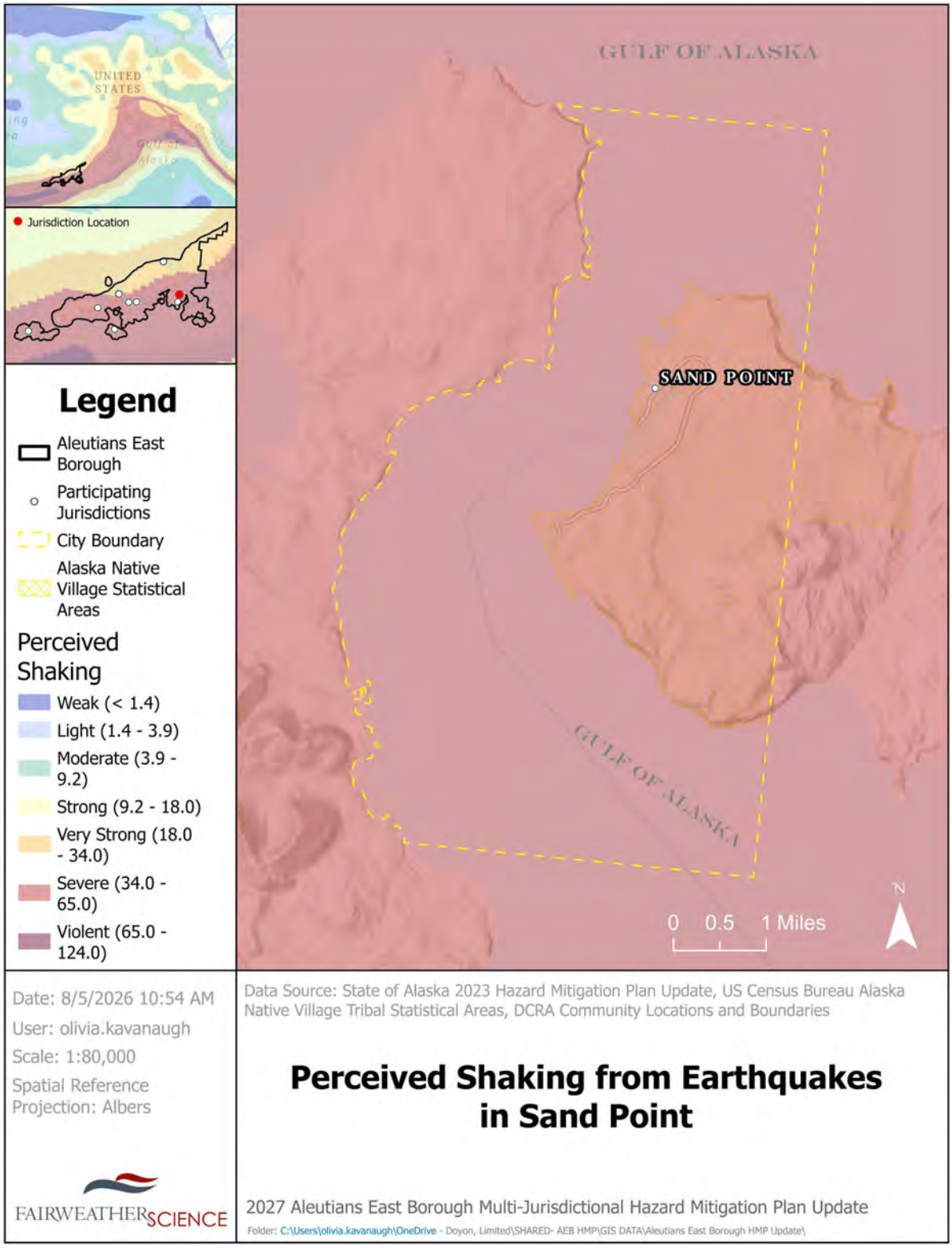



**Figure J-2- Perceived Shaking from Earthquakes in Sand Point**

#### J.4.1.4.2 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including Sand Point can be found in Table 11 of the Base Plan.

#### J.4.1.4.3 Extent (Magnitude and Severity)

Thousands of earthquakes occur each year along the Aleutian chain. Strong shaking has occurred historically in Sand Point and can damage infrastructure and trigger tsunamis.

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding Sand Point experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Between July 2020 and July 2025, Sand Point experienced 5 major earthquakes between M7.2 and M8.2, which has caused damage to the old city dock which has since been condemned. These earthquakes also resulted in damage to the Humboldt Creek Reservoir Dam and its surrounding culverts.

Based on past event history and the criteria identified in Table 5 of the Base Plan, the magnitude and severity of earthquakes and resultant damages to people and infrastructure in Sand Point are considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### J.4.1.4.4 Impact

Most earthquake injuries and fatalities occur within buildings from collapsing walls and roofs, flying glass, and falling objects. As a result, the extent of the Sand Point Planning Area's risk depends not just upon its location relative to known faults, magnitude of the quake, distance from the epicenter and its underlying geology and soils, but also on the design of its structures. Buildings that have not been constructed to meet seismic standards can pose major threats to life and the continued functioning of key public services during an earthquake. Earthquake damage would likely be area-wide with potential damage to critical infrastructure including the complete abandonment of critical facilities. Impacts to community and individual drinking water wells (specific water supply infrastructure damages), in addition to temporary or permanent aquifer or water source changes are also a potential consideration.

In the 2022 inspection of the Humboldt Creek Reservoir Dam, a crack in the earth embankment was observed. The damage was contributed to seismic activity near Sand Point (Terra Firma Testing 2022).

| Description of Impacts | |
|---|---|
| Geography/Land | The City of Sand Point Planning Team did not report specific previous impacts related to earthquakes in this category. |
| Infrastructure | Humboldt Creek Reservoir Dam presumably damaged from earthquakes in the last 6 years (ADSE 2026). The City of Sand Point also cites damage to the city dock and numerous culverts as being previously damaged by earthquakes. |
| People | The City of Sand Point Planning Team did not report specific previous impacts related to earthquakes in this category. |
| Utilities | The City of Sand Point Planning Team did not report specific previous impacts related to earthquakes in this category. |
| Transportation | The City of Sand Point Planning Team did not report specific previous impacts related to earthquakes in this category. |
| Economy | There have been no recorded economic impacts by the Sand Point Planning Team related to earthquakes. |

| Description of Impacts | |
|---|---|
| Subsistence Resources | The City of Sand Point Planning Team did not report specific previous impacts related to earthquakes in this category. |

#### J.4.1.4.5 Probability of Future Events

Sand Point is located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing the City of Sand Point.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Sand Point will experience an earthquake of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### J.4.1.4.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of earthquake events in Sand Point is not anticipated to change in the future. |
| Location | The location of earthquake events in Sand Point is not anticipated to change in the future. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of earthquakes in Sand Point. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of earthquakes in Sand Point. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future earthquake events in Sand Point. Earthquakes are impossible to predict. |
| Population Patterns | Due to the unknown location of earthquake hazards in Sand Point, it is possible that future earthquakes will impact future population patterns. Depending on the severity of the event, an earthquake in Sand Point could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Future climate conditions are not anticipated to influence Land Use Development due to earthquakes in Sand Point. |
| Subsistence Resources | Future climate conditions are not anticipated to influence earthquake related impacts on subsistence resources in Sand Point. |

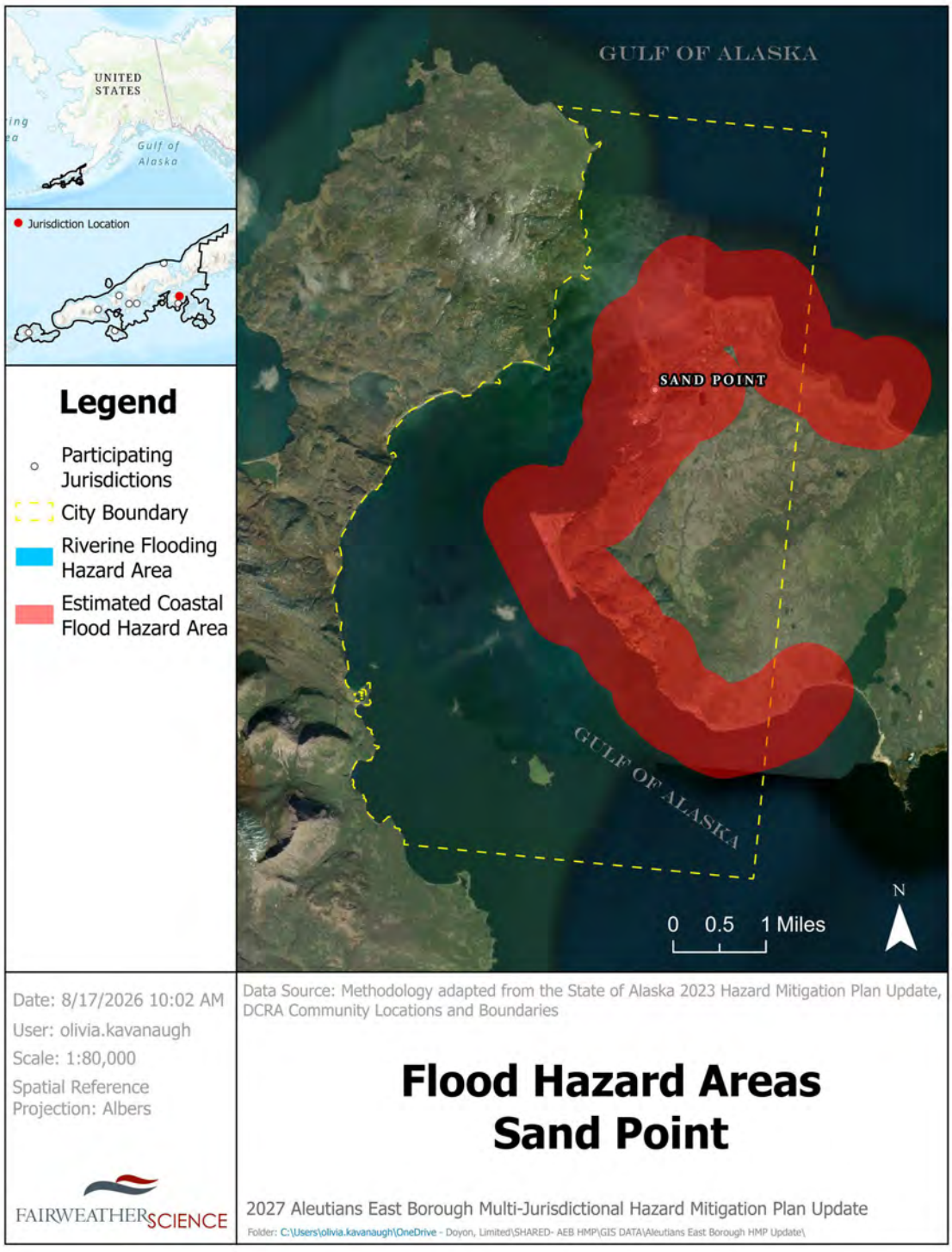
### J.4.1.5 Flood

#### J.4.1.5.1 Location

According to the 2023 State HMP, Sand Point is within the identified Coastal Flooding Area (Figure J-3). The State of Alaska identifies coastal flooding hazard areas of 0.5 miles from the coastline (DHS&EM 2023).

The City of Sand Point Planning Team reported storm surge flooding impacts at the harbor. Generally, coastal and low-lying areas are most vulnerable to flooding events.

Sand Point has minor flooding impacts from rainfall, snowmelt run-off, and storms. Water collects in low terrain depressions and may rise to juts below a structure's first step with no water intrusion on the first floor.




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure J-3- Sand Point Flood Hazard Areas**

#### J.4.1.5.2 History

MHHW represents the average height of the highest daily tide over a long observation period. Coastal flooding is likely when water levels exceed MHHW because it indicates that water has risen above the normal high tide line.

Historic high water level extremes above MHHW which exceeded the 10% annual exceedance probability are shown for Sand Point in the table below. Figure J-5 offers more context for this data.

**Table J-1- Historic Extremes Which Exceeded the 10% Annual Exceedance Probability Levels, Nov 1972 – June 2026**

| Date | Meters above MHHW | Feet above MHHW |
|---|---|---|
| **12/31/1986** | 1.33 | 4 |
| **11/5/2002** | 1.17 | 3.8 |
| **12/22/2022** | 1.41 | 4.6 |
| **1/22/2023** | 1.24 | 4.1 |

Source: NOAA/NOS/Center for Operational Oceanographic Projects and Services 2026

#### J.4.1.5.3 Extent (Magnitude and Severity)

The 2019 Denali Commission *Statewide Threat Assessment: Identification of Threats from Erosion, Flooding, and Thawing Permafrost in Remote Alaska Communities* identified Sand Point as a "threatened" community based on the results of the USACE's Alaska Baseline Erosion Assessment, completed in 2009.

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest has the lowest vulnerability.

Sand Point received a Flood Threat Ranking of 59 out of 63 (Denali Commission 2019). While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking.

NOAA maintains a meteorological station in Sand Point, which was established in September 1972. This station includes wind, air temperature, water temperature, barometric pressure, tsunami WL and microwave ML sensors.

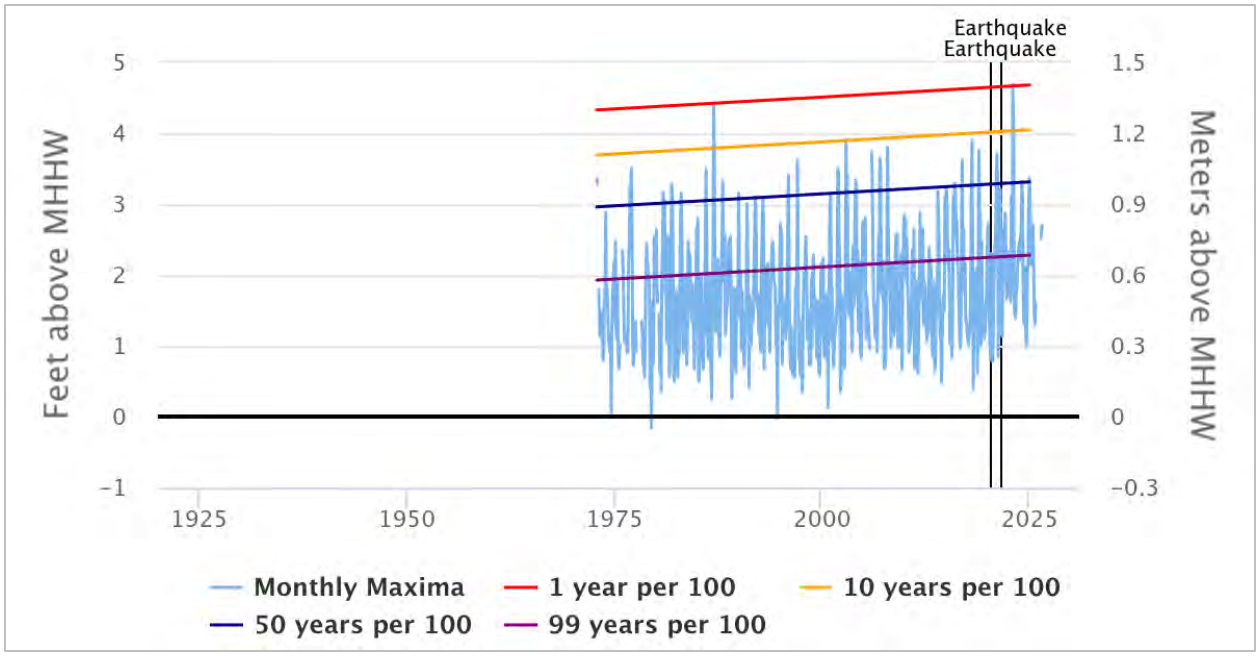


Source: NOAA/NOS/Center for Operational Oceanographic Projects and Services 2026

**Figure J-4- Station 9459450 in Sand Point**

Figure J-5 shows monthly highest and lowest water levels, in meters above and below Mean Higher High Water (MHHW). **This data shows that December 2022 had the highest monthly water level above MHHW at 1.41 meters (4.6 feet) in the period from June 1973 to June 2026.**

The lines indicate annual exceedance probability levels. The purple line indicates a very common low water level with a high exceedance probability of 99 years per 100. The red line indicates a very rare high-water level that is only reached 1% of the time – 1 year in 100.




Source: NOAA/NOS/Center for Operational Oceanographic Projects and Services 2026

**Figure J-5- Extreme Water Levels for Sand Point, Alaska (9459450)**

According to this NOAA data source, “the monthly extreme water levels include a Mean Sea Level (MSL) trend of 1.83 millimeters/year with a 95% confidence interval of +/- 0.8 millimeters/year which is equivalent to a change of 0.60 feet in 100 years” (NOAA/NOS/Center for Operational Oceanographic Projects and Services 2026).

According to the Harbormaster, the City of Sand Point harbor experiences extreme high tides which flood the skiff pad area and occasionally reach the east wall. It is also reported that this flooding has occurred every year since 2022, with some sediment deterioration and land destabilization being reported under the concrete pad for the travel lift.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding in Sand Point considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### J.4.1.5.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The City of Sand Point Planning Team did not report any additional specific previous impacts related to flooding in Sand Point. |
| Infrastructure | The City of Sand Point Planning Team did not report any additional specific previous infrastructure impacts related to flooding in Sand Point. |
| People | The City of Sand Point Planning Team did not report specific instances of personal injury or death related to flooding in Sand Point. |
| Utilities | The City of Sand Point Planning Team did not report any additional specific previous impacts to utilities related to flooding in Sand Point. |
| Transportation | The City of Sand Point Planning Team did not report any additional specific previous transportation impacts related to flooding in Sand Point. |

| | Description of Impact |
|---|---|
| Economy | The City of Sand Point Planning Team did not report specific previous economic impacts from flooding in Sand Point. |
| Subsistence Resources | The City of Sand Point Planning Team did not report any additional specific previous subsistence impacts related to flooding in Sand Point. |

#### J.4.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Sand Point will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### J.4.1.5.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in the Sand Point Planning Area as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in the Sand Point Planning Area is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in the Sand Point Planning Area, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in the Sand Point Planning Area. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021). |

| Description of Future Conditions | |
|---|---|
| | Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in the Sand Point Planning Area, however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |
| Population Patterns | It is possible that future flood events will cause changes in population patterns in the Sand Point Planning Area as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### J.4.1.6 Ground Failure/Landslide

The City of Sand Point Planning Team did not select this hazard to be profiled in the MJHMP update.

There have been one historical landslide events near Sand Point, outside of City boundaries (Figure J-6). No information is provided about these events, and they did not impact critical infrastructure in the community.

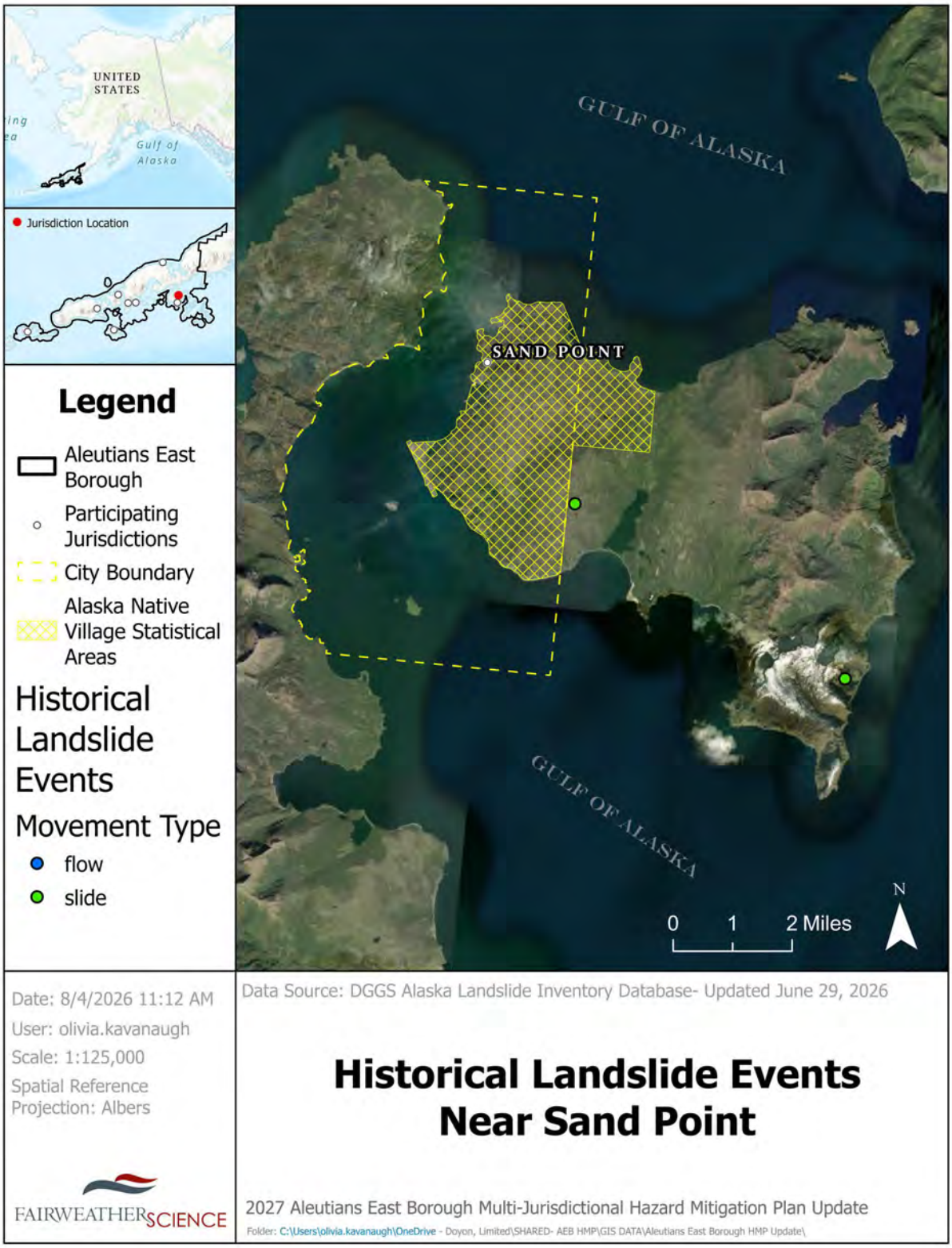



**Figure J-6- Historical Landslide Events near Sand Point**

### J.4.1.7 Invasive Species

#### J.4.1.7.1 Location

The entire natural area surrounding Sand Point is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. Sand Point's location adjacent to a busy coastal port is a possible human-caused pathway in the spread of invasive species in the community. Invasive plant seeds can be transported unintentionally on vessels and cargo, potentially allowing species introduced near developed areas to spread into natural areas.

#### J.4.1.7.2 History

Sand Point has had historical vessel traffic related to the fishing and shipping industry, which can contribute to the spread of invasive species in the region. While there have been no historical occurrences of invasive rat populations or invasive aquatic animals in the community, Sand Point has had a reported invasive plant occurrence, which was identified as the highly invasive Orange Hawkweed (USFWS 2026).

While there are no documented occurrences of invasive plants in Sand Point according to the AKEPIC database, this absence of records may be attributed to limited sampling and survey efforts in the area rather than an absence of invasive species.

#### J.4.1.7.3 Extent (Magnitude and Severity)

While the threat of an invasive species event in Sand Point remains high, previous occurrences and knowledge of the magnitude and severity are currently limited.

According to a City of Sand Point Planning Team member, Orange Hawkweed is commonly seen around town during the months of July and August.

As there are no public-submitted entries of documented invasive species in Sand Point in the AKEPIC database, the total infested acreage in Sand Point is unknown.

Based on previous occurrences and the criteria identified in Table 5 of the Base Plan, the magnitude and severity to Sand Point from invasive species are considered **Limited**.

#### J.4.1.7.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of invasive species on the land surrounding Sand Point has been localized non-native plant infestations, which can outcompete native plants and wildlife. |
| Infrastructure | There is limited evidence that invasive species have directly impacted infrastructure in Sand Point. |
| People | While invasive species can affect resources that people depend on, Sand Point has no history of invasive species directly affecting the residents of the community. |
| Utilities | There have been no documented cases of invasive species causing utility disruptions in Sand Point. |
| Transportation | Transportation is identified as a potential pathway for invasive species to spread throughout Sand Point. Due to the nature of invasive species in the community, there is little evidence to show that these species cause direct damage to transportation infrastructure in Sand Point. |
| Economy | There have been no reports of an invasive species infestation resulting in significant economic impacts in Sand Point. |
| Subsistence Resources | Invasive species pose a potential threat to subsistence resources in Sand Point, primarily related to the threat of non-native plants outcompeting native plants that residents rely on for subsistence activities. |

#### J.4.1.7.5 Probability of Future Events

Based on previous occurrences, and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Sand Point will experience an invasive species event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### J.4.1.7.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is possible future climate conditions will influence the nature of invasive species in Sand Point. Warmer temperatures and longer growing seasons may allow some invasive species to become established in areas where they don't historically occur. |
| Location | It is likely future climate conditions will influence the location of invasive species in Sand Point. Changes in temperature and precipitation patterns may allow invasive species to expand into new terrestrial and marine areas of Sand Point. |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of invasive species in Sand Point. Future changes may create favorable conditions for certain invasive species, allowing populations to spread at a rapid rate. |
| Impact | It is likely future climate conditions will influence the impacts of invasive species in Sand Point. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of invasive species in Sand Point. As environmental conditions change, areas that were previously unsuitable for certain invasive species may become more favorable for establishment and spread, which increases the probability of future events in Sand Point. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Sand Point. Changes in the distribution and abundance of invasive species may alter the availability of food and habitat relied upon by wildlife and residents of Sand Point. |
| Land Use Development | It is unlikely future climate conditions will influence future land use development in Sand Point. |
| Subsistence Resources | It is likely future climate conditions will influence subsistence resources in Sand Point. Changes in ocean conditions, weather patterns, and species distribution may affect the availability and accessibility of important subsistence resources. The introduction or expansion of invasive species could further impact native species that support subsistence activities in Sand Point. |

### J.4.1.8 Sediment Deterioration and Land Destabilization

#### J.4.1.8.1 Location

Sediment deterioration and land destabilization can occur throughout Sand Point, with coastal land destabilization being the biggest concern for the community. Since Sand Point is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surges, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.

Riverine sediment deterioration and land destabilization aren't identified as a concern for the community.

While the extent of sediment deterioration and land destabilization in Sand Point varies by location, many facilities like the harbor may be increasingly vulnerable to future destabilization.

#### J.4.1.8.2 History

The history of coastal sediment deterioration and land destabilization in Sand Point varies by location due to the localized nature of storms in the community. According to a City of Sand Point Planning Team member, the harbor in the community experiences impacts from coastal sediment deterioration and land destabilization.

#### J.4.1.8.3 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of sediment deterioration and land destabilization vary throughout select communities. In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk. Sand Point was categorized in erosion Group 3, which places it at a lower risk of sediment deterioration and land destabilization according to the study.

According to the Harbormaster, the City of Sand Point harbor experiences extreme high tides which flood the skiff pad area and occasionally reach the east wall. This flooding has occurred every year since 2022, which has contributed to sediment deterioration and land destabilization under the concrete pad for the travel lift. To date the extent has been limited to several inches to feet in this area.

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the extent of sediment deterioration and land destabilization in Sand Point is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### J.4.1.8.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding Sand Point has been damages to shoreline and beaches, particularly along areas exposed to waves and storms. In the community, impacts from destabilization has been documented near critical facilities such as the harbor. |
| Infrastructure | Sediment deterioration and land destabilization impacts in Sand Point have been documented near the harbor. Continued land destabilization could threaten additional community infrastructure and increase mitigation costs. |
| People | While sediment deterioration and land destabilization can affect residents of Sand Point by threatening homes and access to subsistence areas, direct impacts to people in Sand Point resulting from land destabilization have been limited. |

| Description of Impact | |
|---|---|
| Utilities | There have been no documented impacts to the utilities in Sand Point from sediment deterioration and land destabilization events. |
| Transportation | The primary transportation related impacts from a sediment deterioration and land destabilization event in Sand Point are damage to roads, boardwalks, and other transportation infrastructure. There have been no reports of land destabilization resulting in substantial disruptions to transportation in Sand Point. |
| Economy | There are a substantial number of roads in Sand Point that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities. |
| Subsistence Resources | A primary concern related to subsistence resources in Sand Point is the loss of subsistence fish camps that have been used for generations, which have the potential to be washed-out or the access restricted during a storm. |

#### J.4.1.8.5 Probability of Future Events

The coastal geography influences the likelihood of continued sediment deterioration and land destabilization in Sand Point.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Sand Point will experience a sediment deterioration and land destabilization event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### J.4.1.8.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in Sand Point. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in Sand Point. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal land destabilization in Sand Point (AK DGGS 2026). |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in Sand Point. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in Sand Point. Projected increases in precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in Sand Point. Although the probability for land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |

| Description of Future Conditions | |
|---|---|
| Population Patterns | It is possible future climate conditions will influence population patterns in Sand Point. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of Sand Point entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Sand Point. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in Sand Point. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

### J.4.1.9 Severe Weather

The City of Sand Point Planning Team reports experiencing severe weather, including high wind, freezing rain/ice storm, and extreme cold events.

#### J.4.1.9.1 Location

All of Sand Point is vulnerable to severe weather events.

#### J.4.1.9.2 History

Sand Point has a history of high wind events and winter storms. See Table 16 in the Base Plan for severe weather history in the Aleutians East Borough Planning Area. The City of Sand Point Planning Team reported high wind conditions that occasionally cause tin roofing to come off houses and structures. Temperatures below zero have also been reported, with the 2025-2026 winter season resulting in more than a dozen water pipes in homes freezing up.

#### J.4.1.9.3 Extent (Magnitude and Severity)

Table J-2 shows monthly averages for maximum temperature, minimum temperature, total precipitation, average total snowfall, and snow depth from 1980 to 1994 in Sand Point.

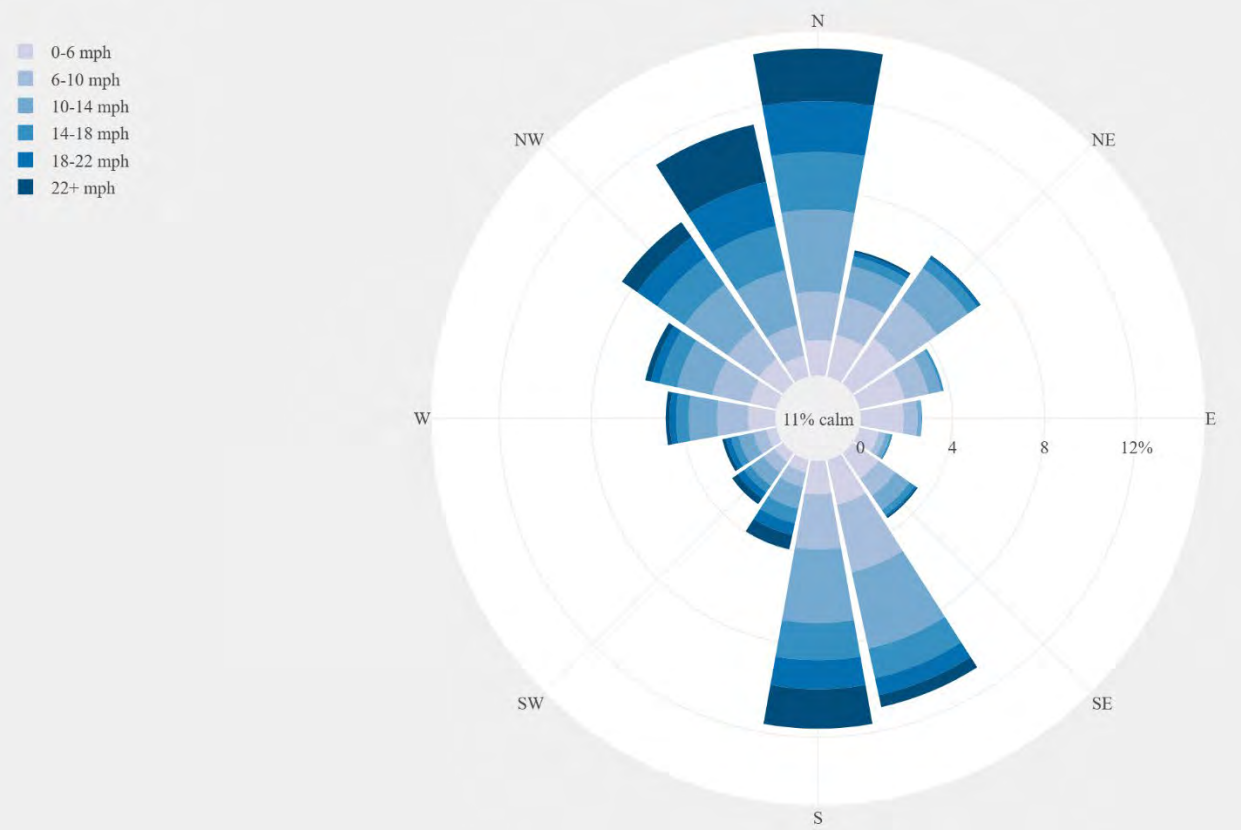
**Table J-2- Monthly Climate Summary 6/1/1980-6/30/1994, Sand Point**

| | Jan | Feb | Mar | April | May | June | July | Aug | Sept | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Avg.Max. Temp (F)** | 36.2 | 34.9 | 37.7 | 39.2 | 45.3 | 51.9 | 57.5 | 57.6 | 53.9 | 46.6 | 41.3 | 38.6 | 45.1 |
| **Avg. Min. Temp (F)** | 29.0 | 27.0 | 28.9 | 30.6 | 36.4 | 41.8 | 46.8 | 48.1 | 44.1 | 37.6 | 33.2 | 31.3 | 36.2 |
| **Avg. Total Precipitation (in.)** | 3.88 | 2.60 | 3.26 | 2.41 | 3.03 | 3.15 | 2.87 | 4.01 | 6.32 | 3.89 | 3.47 | 5.79 | 44.68 |
| **Avg. Total Snowfall (in.)** | 5.6 | 1.8 | 1.5 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 2.0 | 12.9 |
| **Avg. Snow Depth (in.)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: WRCC 2026

The City of Sand Point Planning Team has reported temperatures below zero, compounded by wind chill.

Average wind speeds in Sand Point are highest in the winter months, according to the Western Regional Climate Center. Figure J-7 below illustrates average wind speeds and directions at the Sand Point Airport over the course of the year from 1980-2025, demonstrating that wind speeds do reach 22+ mph.




Source: UAF SNAP & WRCC 2025

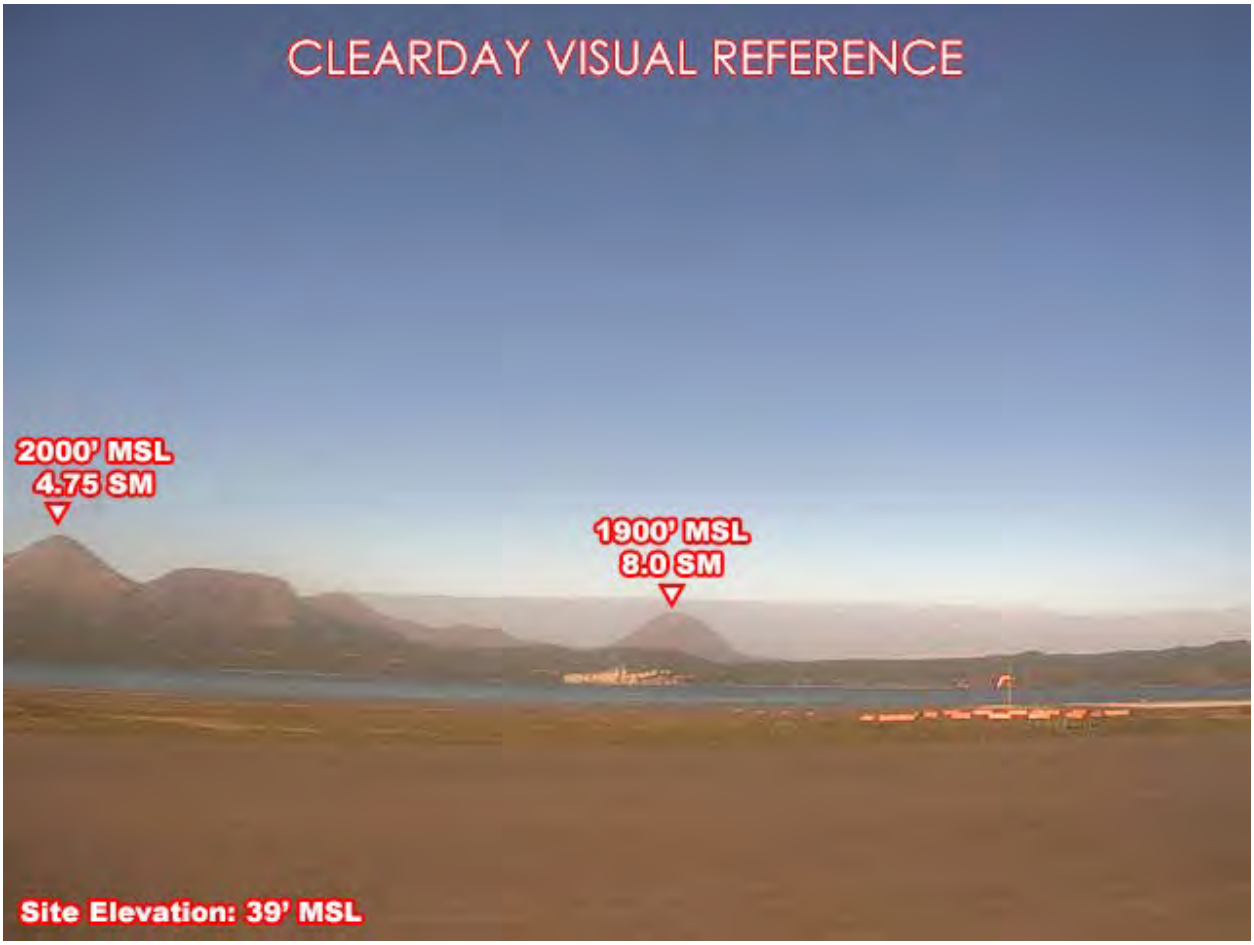
**Figure J-7- Wind Speed/Direction Distribution for Sand Point Airport, 1980-2025**

Dense fog can disrupt travel at the Sand Point Airport. The Federal Aviation Administration monitors weather cameras at the Sand Point Airport. Below are images of an overcast day and a clear day visual reference. These images are from August 13, 2026 and are intended to provide a qualitative visual reference of the impact of weather on visibility at the airport.




Source: FAA WeatherCams 2026

**Figure J-8- Sand Point Airport on 8/13/2025, Facing West**




Source: FAA WeatherCams 2026

**Figure J-9- Sand Point Airport on 8/13/2025, Facing West, Clear Day**

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather events in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### J.4.1.9.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The City of Sand Point Planning Team did not report any specific previous impacts to geography/land from severe weather events in Sand Point. |
| Infrastructure | The City of Sand Point Planning Team reported damage to roofs of houses and buildings from previous high wind events. |
| People | The City of Sand Point Planning Team did not report any specific previous impacts to people from severe weather events in Sand Point. |
| Utilities | The City of Sand Point Planning Team reported water pipes freezing in over 12 homes due to extreme cold. |
| Transportation | The City of Sand Point Planning Team did not report any specific previous impacts to transportation from severe weather events in Sand Point. |

| | Description of Impact |
|---|---|
| Economy | The City of Sand Point Planning Team did not report specific previous economic impacts from severe weather events in Sand Point. |
| Subsistence Resources | The City of Sand Point Planning Team did not report any specific previous impacts from severe weather events in Sand Point. |

#### J.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Sand Point will experience a severe weather event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

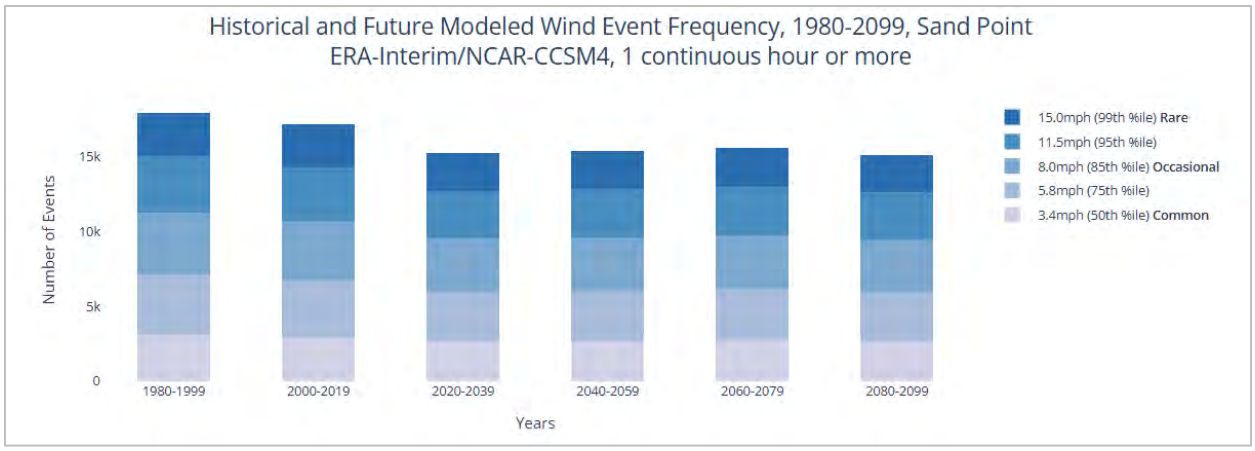
### J.4.1.9.6 Future Climate Conditions

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in the Sand Point Planning Area. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in the Sand Point Planning Area. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in the Sand Point Planning Area. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in the Sand Point Planning Area. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in the Sand Point Planning Area. | It is unlikely that future climate conditions will influence the nature of future high wind events in the Sand Point Planning Area. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in the Sand Point Planning Area. | It is possible that future climate conditions will influence the location of future drought/water supply events in the Sand Point Planning Area. | It is unlikely that future climate conditions will influence the location of future extreme cold events in the Sand Point Planning Area. | It is unlikely that future climate conditions will influence the location of future heavy rain events in the Sand Point Planning Area. | It is unlikely that future climate conditions will influence the location of future heavy snow events in the Sand Point Planning Area. | It is unlikely that future climate conditions will influence the location of future high wind events in the Sand Point Planning Area. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in Sand Point could increase (UAF/SNAP 2026). | In the Aleutians East Borough, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026).<br>Winter temperatures are increasing the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026).<br>Specific modelling for Sand Point was not available. | In the Aleutians East Borough, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026).<br>Winter temperatures are increasing the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026).<br>Specific modelling for Sand Point was not available. | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in the Sand Point Planning Area. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP).<br>Extreme precipitation events have occurred throughout Alaska with increasing frequency. In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>The Sand Point Planning Area experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months. Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). However, UAF/SNAP modeling projects similar wind speeds in Sand Point in the future (UAF/SNAP 2026). |
| Impact | Projected increases in precipitation and associated moisture availability in the Aleutians East Borough could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026).<br>Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in the Aleutians East Borough are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities in the Aleutians East Borough (Alaska DHS&EM 2023). | While overall temperature trends in the Aleutians East Borough are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | It is possible that the increasing frequency of extreme precipitation events may lead to more frequent road washouts, transportation infrastructure impacts, and damages to public infrastructure and homes. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023). Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026).<br>A shift from snow to rain impacts water storage capacity and surface | UAF/SNAP modeling projects similar wind speeds in Sand Point in the future (UAF/SNAP 2026). However, state-wide models project more high-wind events across Alaska, possibly increasing impacts from high wind events (NOAA 2025), |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir levels. The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in the Sand Point Planning Area by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in the Aleutians East Borough are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In the Aleutians East Borough Planning Area, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in the Aleutians East Borough are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future. Average monthly temperatures are projected to increase in Sand Point (UAF/SNAP 2026).<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In the Sand Point Planning Area, winter is likely to have more precipitation (UAF/SNAP 2026).<br>Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in the Sand Point Planning Area may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in the Sand Point Planning Area have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in the Sand Point Planning Area. | Future conditions of drought are not anticipated to significantly affect population patterns in the Sand Point Planning Area. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in the Sand Point Planning Area.<br>While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the community. | Future conditions of heavy snow are not anticipated to affect future population patterns in the Sand Point Planning Area. | Future conditions of heavy snow are not anticipated to affect future population patterns in the Sand Point Planning Area. | Future conditions of high winds are not anticipated to affect future population patterns in the Sand Point Planning Area. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in the Sand Point Planning Area. | Future conditions of drought are not anticipated to substantially affect future land use development in the Sand Point Planning Area. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in the Sand Point Planning Area, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in the Sand Point Planning Area population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in the Sand Point Planning Area land use development. | It is not likely that future conditions of high winds will impact changes in the Sand Point Planning Area population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in the Sand Point Planning Area. | Future conditions of drought may affect subsistence resources in the Sand Point Planning Area, particularly berry availability, by influencing plant growth, flowering, and seasonal | Future conditions of extreme cold may affect subsistence resources in the Sand Point Planning Area, particularly berry availability, by influencing plant growth, flowering, and seasonal | It is possible that future conditions of heavy rain will impact changes in the Sand Point Planning Area land use development. An increase in frequency of heavy rains could oversaturate soil | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in | It is not likely that future conditions of high winds will impact changes in the Sand Point Planning Area land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | on the slopes above the Sand Point Planning Area, leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to development of landslide monitoring equipment and/or landslide barriers/diversion structures. | temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, thermal stress, and nutrient availability for subsistence species. | |

Figure J-10 models historical and future wind event frequency in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts a slight decrease in the overall frequency of high wind events in Sand Point by the end of the century, with a relatively stable frequency of wind speeds in general.




Source: UAF/SNAP 2026- Community Wind

**Figure J-10- Historical and Future Modeled Wind Event Frequency in Sand Point (1980-2099)**

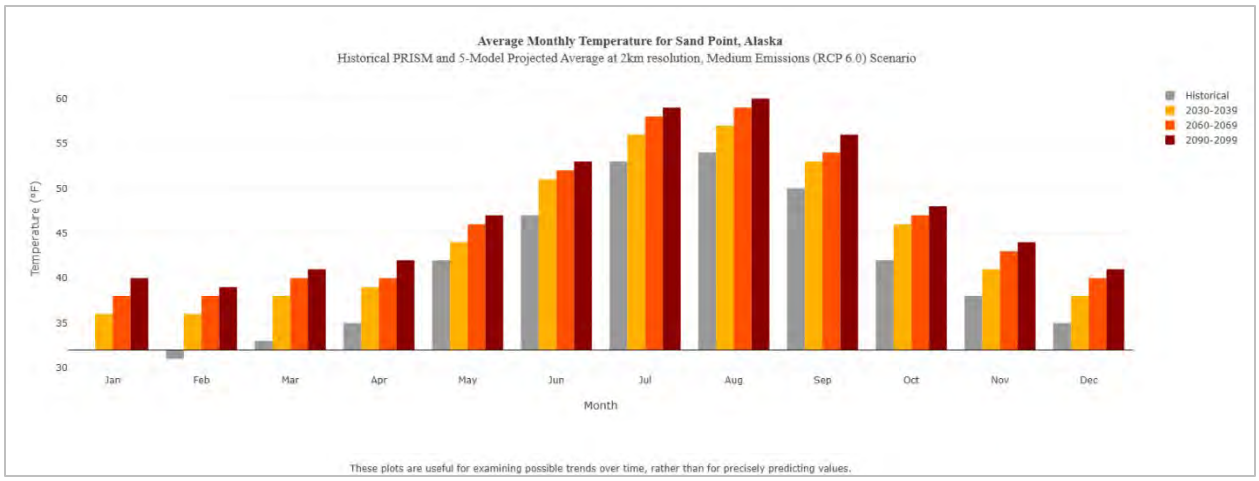
Figure J-11 models historical and future duration of the growing season in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure J-11- Historical and Future Projected Changes in Growing Season in Sand Point (1980-2099)**

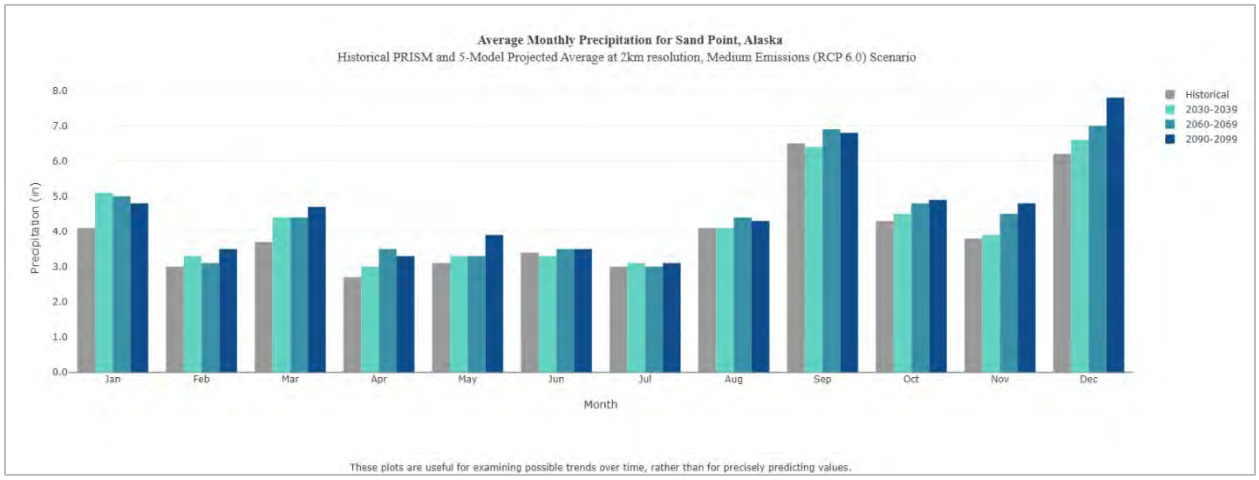
Figure J-12 models historical and future average monthly temperatures in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure J-12- Historical and Future Projected Average Monthly Temperature in Sand Point (1980-2099)**

Figure J-13 models historical and future average monthly precipitation in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure J-13- Historical and Future Projected Average Monthly Precipitation in Sand Point (1980-2099)**

### J.4.1.10 Tsunami

#### J.4.1.10.1 Location

The majority of critical facilities and infrastructure in Sand Point are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community (Figure J-14).

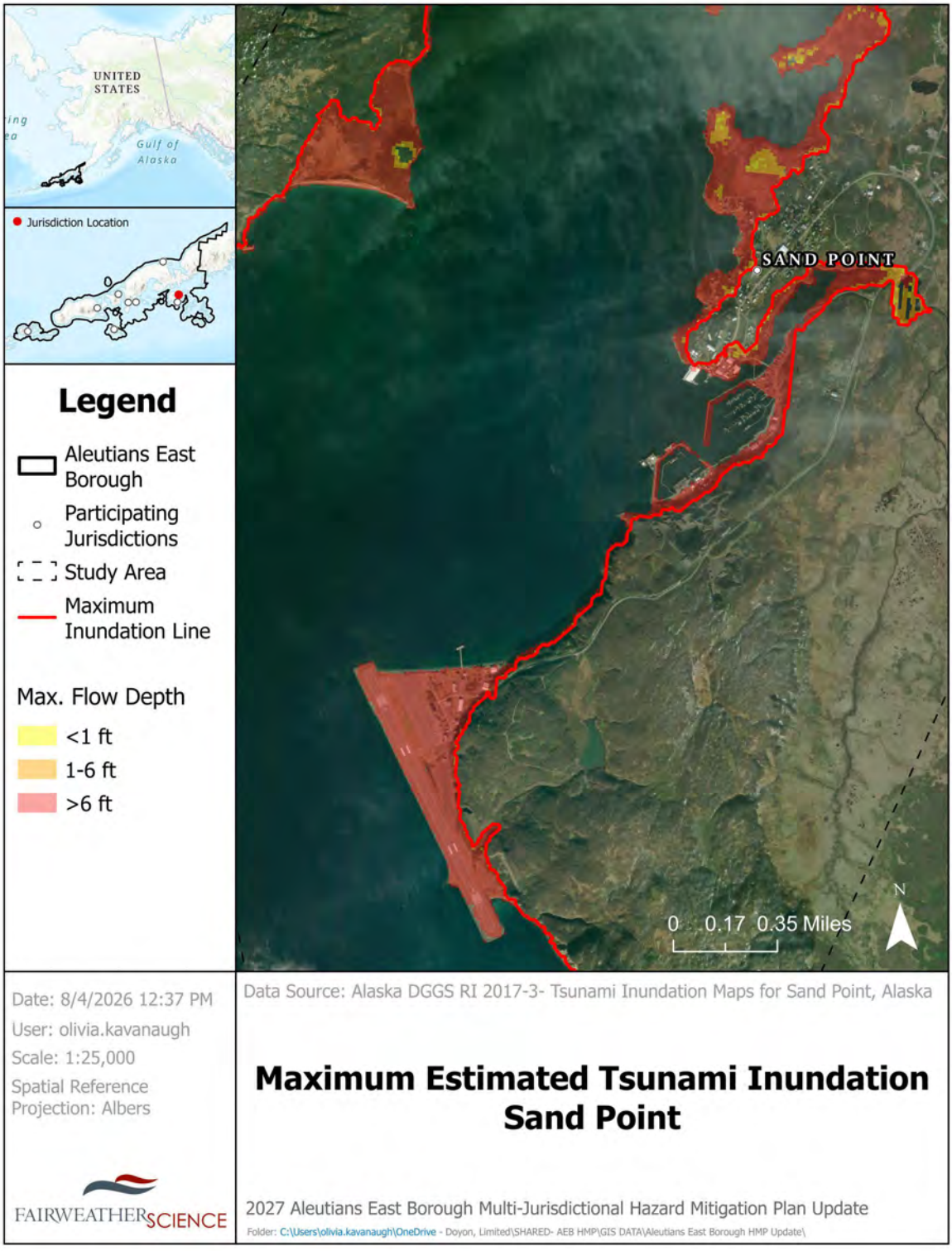



**Figure J-14- Sand Point Potential Tsunami Inundation**

### J.4.1.10.2 History

Sand Point is located near historic tsunami event sites, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. See Table 17 in the Base Plan for a comprehensive list from the NOAA National Centers for Environmental Information (NCEI) detailing the earthquake-generated tsunamis with observed or measured waves throughout the Aleutians East Borough.

Since 1788, there have been 28 documented tsunami runup events in Sand Point (Table J-3 and Figure J-15). The most recent runup event in Sand Point was recorded in July 2025.

**Table J-3- Historical Tsunami Runups- Sand Point (1788 - August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 17 | 1946-04-01 | SAND POINT, AK | EQ + LS | 8.6 | Unknown |
| 50 | 1985-03-03 | SAND POINT, AK | EQ | 8 | 0.26 |
| 51 | 1986-05-07 | SAND POINT, AK | EQ | 8 | 0.16 |
| 52 | 1989-09-04 | SAND POINT, AK | EQ | 7.1 | 0.33 |
| 53 | 1995-07-30 | SAND POINT, AK | EQ | 8 | 0.36 |
| 54 | 1996-06-10 | SAND POINT, AK | EQ | 7.9 | 0.16 |
| 55 | 2001-06-23 | SAND POINT, AK | EQ | 8.4 | 0.39 |
| 56 | 2003-11-17 | SAND POINT, AK | EQ | 7.8 | 0.13 |
| 57 | 2004-12-26 | SAND POINT, AK | EQ | 9.1 | 0.46 |
| 59 | 2006-05-03 | SAND POINT, AK | EQ | 8 | 0.16 |
| 60 | 2006-11-15 | SAND POINT, AK | EQ | 8.3 | 0.36 |
| 62 | 2007-08-15 | SAND POINT, AK | EQ | 8 | 0.13 |
| 65 | 2010-02-27 | SAND POINT, AK | EQ | 8.8 | 1.25 |
| 67 | 2011-03-11 | SAND POINT, AK | EQ | 9.1 | 2.00 |
| 71 | 2012-10-28 | SAND POINT, AK | EQ | 7.7 | 0.20 |
| 72 | 2013-02-06 | SAND POINT, AK | EQ | 7.9 | 0.36 |
| 74 | 2014-04-01 | SAND POINT, AK | EQ | 8.2 | 0.30 |
| 76 | 2015-09-16 | SAND POINT, AK | EQ | 8.3 | 0.62 |
| 79 | 2020-07-22 | SAND POINT, AK | EQ | 7.8 | 0.79 |
| 80 | 2020-10-19 | SAND POINT, AK | EQ | 7.6 | 2.30 |
| 82 | 2021-03-04 | SAND POINT, AK | EQ | 8.1 | 0.52 |
| 83 | 2021-07-29 | SAND POINT, AK | EQ | 8.2 | 1.35 |
| 85 | 2021-07-29 | RANGE ISLAND, SAND POINT, AK | EQ | 8.2 | Unknown |
| 87 | 2021-08-12 | SAND POINT, AK | EQ | 8.1 | 0.20 |
| 89 | 2022-01-15 | SAND POINT, AK | VO | N/A | 1.12 |
| 91 | 2023-07-16 | SAND POINT, AK | EQ | 7.2 | 0.49 |

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 92 | 2025-07-16 | SAND POINT, AK | EQ | 7.3 | 0.33 |
| 94 | 2025-07-29 | SAND POINT, AK | EQ | 8.8 | 0.79 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

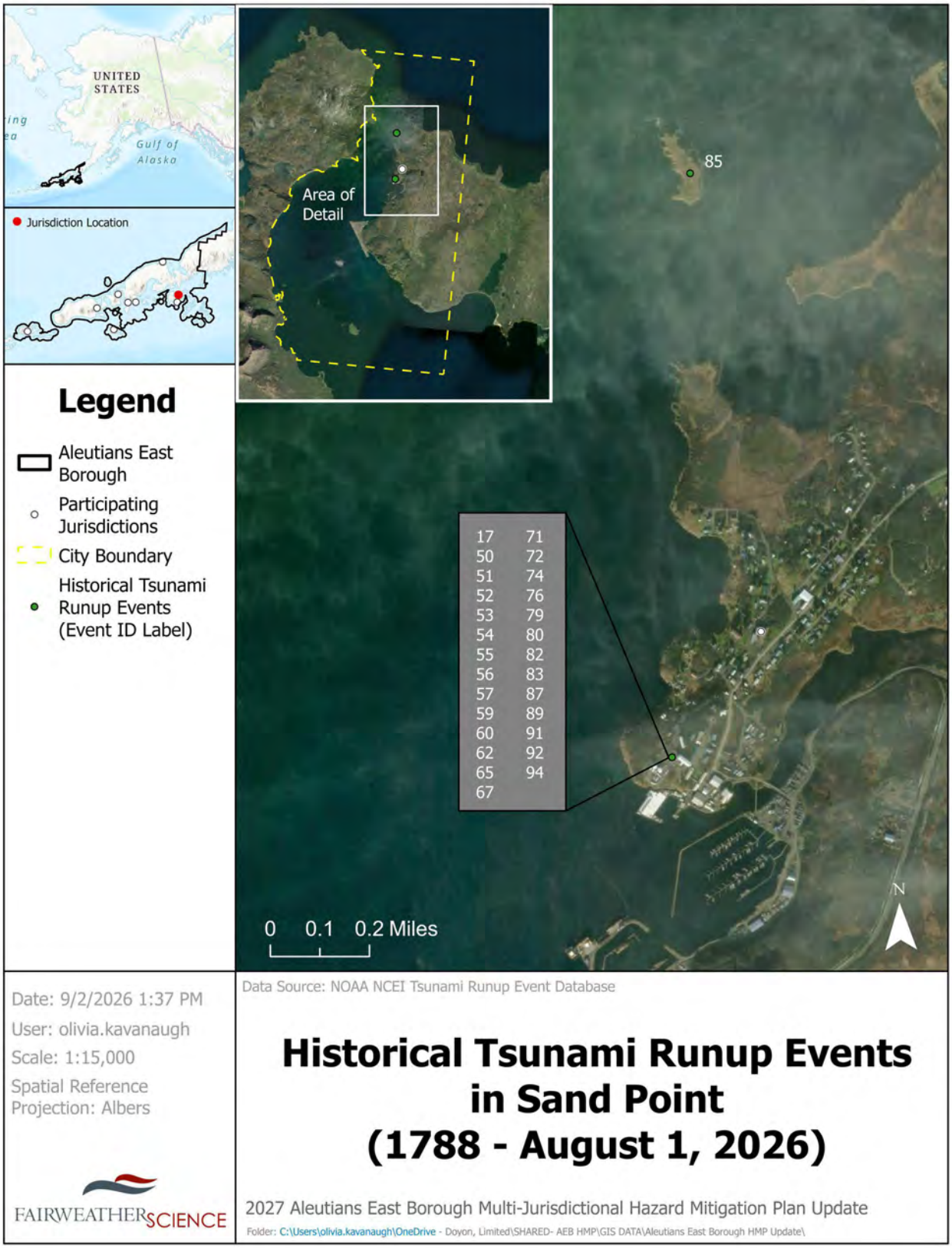



**Figure J-15- Historical Tsunami Runup Events in Sand Point (1788 – August 1, 2026)**

#### J.4.1.10.3 Extent (Magnitude and Severity)

Sand Point has experienced tsunami runups ranging in size from less than 1 foot to 2.3 feet.

Based on Figure J-14, maximum potential inundation in Sand Point could be over 6 feet in depth.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### J.4.1.10.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | There have been documented tsunami runups up to 2.3 feet in Sand Point. Future tsunami runups could potentially match or exceed these heights, having significant impact on the shoreline. |
| Infrastructure | There are no recorded impacts from tsunamis in Sand Point. Water damage in coastal lying infrastructure is possible during a tsunami, as is damage to boat harbors, roadways, and airport runways.<br>Critical facilities at risk of tsunami inundation include the Salmon Hatchery, Aquaculture Building, Church, Saint Nicholas Church, Storage Building, Volunteer Fire Department Building, Fire Boat, FAA Building, ARFF / SREB Building, Robert E. Galovin Small Boat Harbor, Harbor House, Sand Point Boat Storage, Trident Seafood Dock, SDP 150 Ton Travel Lift, Sand Point Harbor, Large Boat Dock, Harbor Dock, Cargo Storage Area, Sand Point Ferry Dock, City Dock, Sand Point DOT, Reeve Air Building, Aviation Terminal, Airport Runway, Small Airplane Storage, Water Reservoir, City Pump House, and Humboldt Creek Reservoir Dam. |
| People | There is no record of injuries or fatalities due to tsunamis or in Sand Point. Injuries and death are possible during a tsunami runup due to drowning, being swept into debris, or trapped during inundation. |
| Utilities | There is no record of utility disruptions due to tsunamis in Sand Point. Tsunamis can damage underground water and sewer lines, underwater cables, overhead power lines, and septic systems. |
| Transportation | There are no recorded tsunami related impacts on transportation systems in Sand Point. Future tsunamis could impact road and air travel by damaging or inundation runway surfaces and roadways. Marine travel could also be limited or delayed due to damage to boat harbors, marine vessels, or fueling stations along the coast. |
| Economy | There are no recorded economic impacts due to tsunamis in Sand Point. |
| Subsistence Resources | There are no recorded tsunami related impacts on subsistence resources in Sand Point. |

#### J.4.1.10.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Sand Point will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

### J.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in Sand Point is not anticipated to change in the future. |
| Location | The location of tsunami events in Sand Point is not anticipated to change in the future. All low-lying coastal areas in Sand Point will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in Sand Point. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in Sand Point. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in Sand Point. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in Sand Point, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in Sand Point could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in Sand Point, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in Sand Point, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area. Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in Sand Point. |

### J.4.1.11 Volcano

#### J.4.1.11.1 Location

The entire geography of Sand Point is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.

According to the 2023 State of Alaska HMP, Sand Point is located in a **moderate** volcanic ash hazard level area.

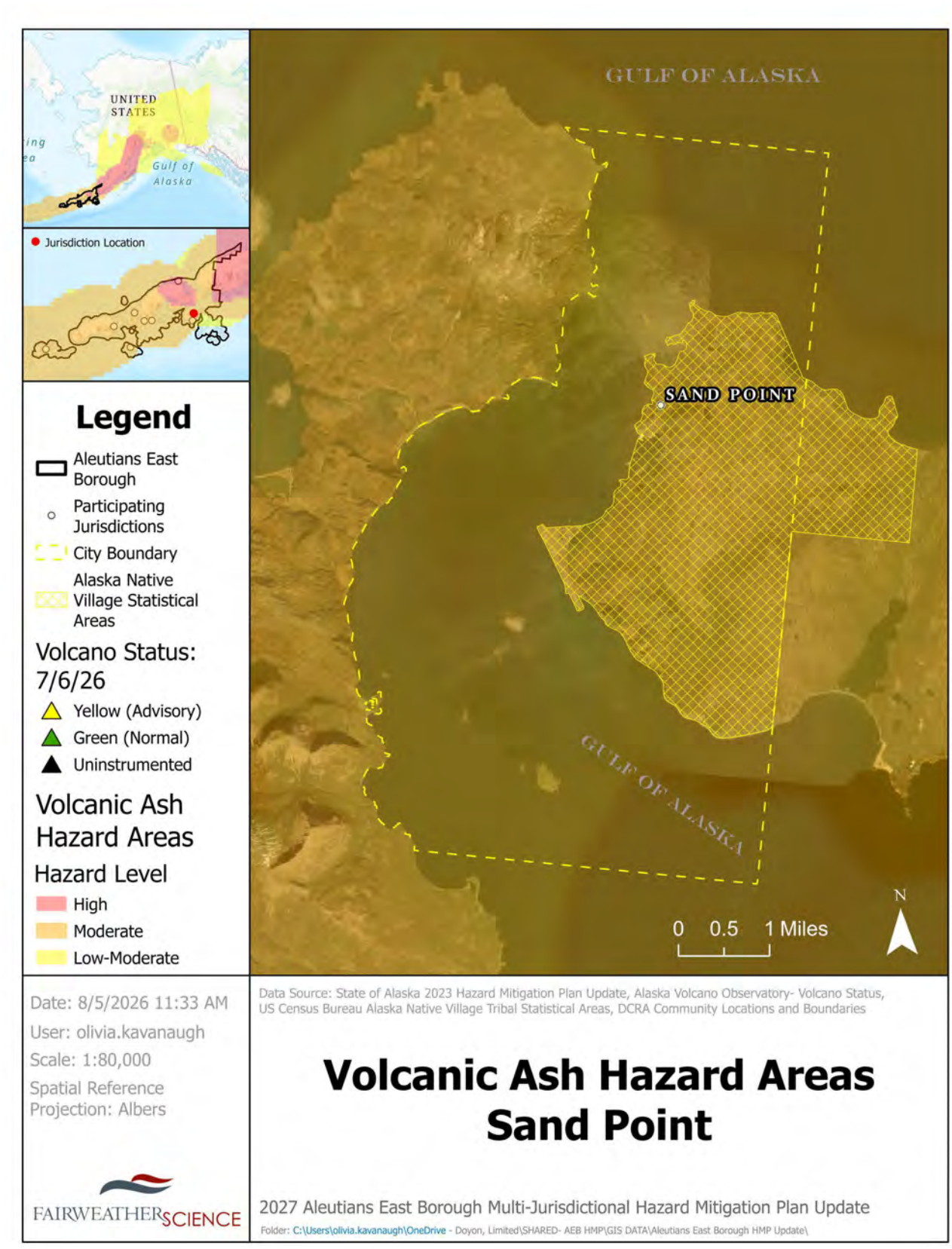



**Figure J-16- Sand Point Volcanic Hazard Areas**

#### J.4.1.11.2 History

Sand Point has a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to Sand Point is **Mount Pavlof**, which is approximately 55 miles west of the community. Pavlof has erupted a total of 31 times since 1900, with several of them resulting in localized impacts. The eruptions in 1975, 1996, 2007, 2013, and 2014 resulted in light ash fall accumulating in several AEB communities, including Sand Point.

**Mount Shishaldin** is a historically active volcano that has resulted in several eruptions that has impacted the AEB, including Sand Point. Located approximately 143 miles southwest of Sand Point, Shishaldin has erupted a total of 24 times since 1900. In 2023, it was reported that an eruption from Shishaldin resulted in light ash fall accumulating in Sand Point (AVO 2023).

#### J.4.1.11.3 Extent (Magnitude and Severity)

Sand Point is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, Sand Point has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community.

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcanoes in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### J.4.1.11.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding Sand Point has been ashfall. While most of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposit (USGS 2015). |
| Infrastructure | The historical ashfall reported in Sand Point has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of Sand Point from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. |
| Utilities | There have been no documented cases of volcanic eruptions causing utility disruptions in Sand Point. While wet ash can cause power outages by coating insulators and transformers, the ashfall in the community from past eruptions have only resulted in trace amounts scattered throughout Sand Point (USGS 2015). |
| Transportation | The primary transportation related impact from a volcanic eruption in Sand Point is aircraft interruptions. Ash clouds from Mount Pavlof's 2013 and 2014 eruptions caused flights from the Sand Point Airport to be cancelled for a total of 1 week (AVO 2014). |
| Economy | The primary economic related impact from a volcanic eruption in Sand Point is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations. |
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in Sand Point that has impacted the community's access to subsistence resources. |

#### J.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact Sand Point.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Sand Point will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### J.4.1.11.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in Sand Point. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in Sand Point. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in Sand Point. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in Sand Point. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in Sand Point. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in Sand Point. |
| Land Use Development | Future climate conditions are not expected to influence land use development in Sand Point. |
| Subsistence Resources | Future climate conditions are not expected to influence Sand Point's ability to access subsistence resources. |

### J.4.1.12 Wildland Fire

#### J.4.1.12.1 Location

According to LANDFIRE's (Landscape Fire and Resource Management Planning Tools Project) 2025 Alaska Statewide Wildfire Exposure Assessment, the majority of the Sand Point Planning Area is located in an area that is **Minimally Exposed to Wildfire Hazard**. The population center of Sand Point is located in an area that is Infrequently Exposed to Wildfire Hazard (Figure J-17).

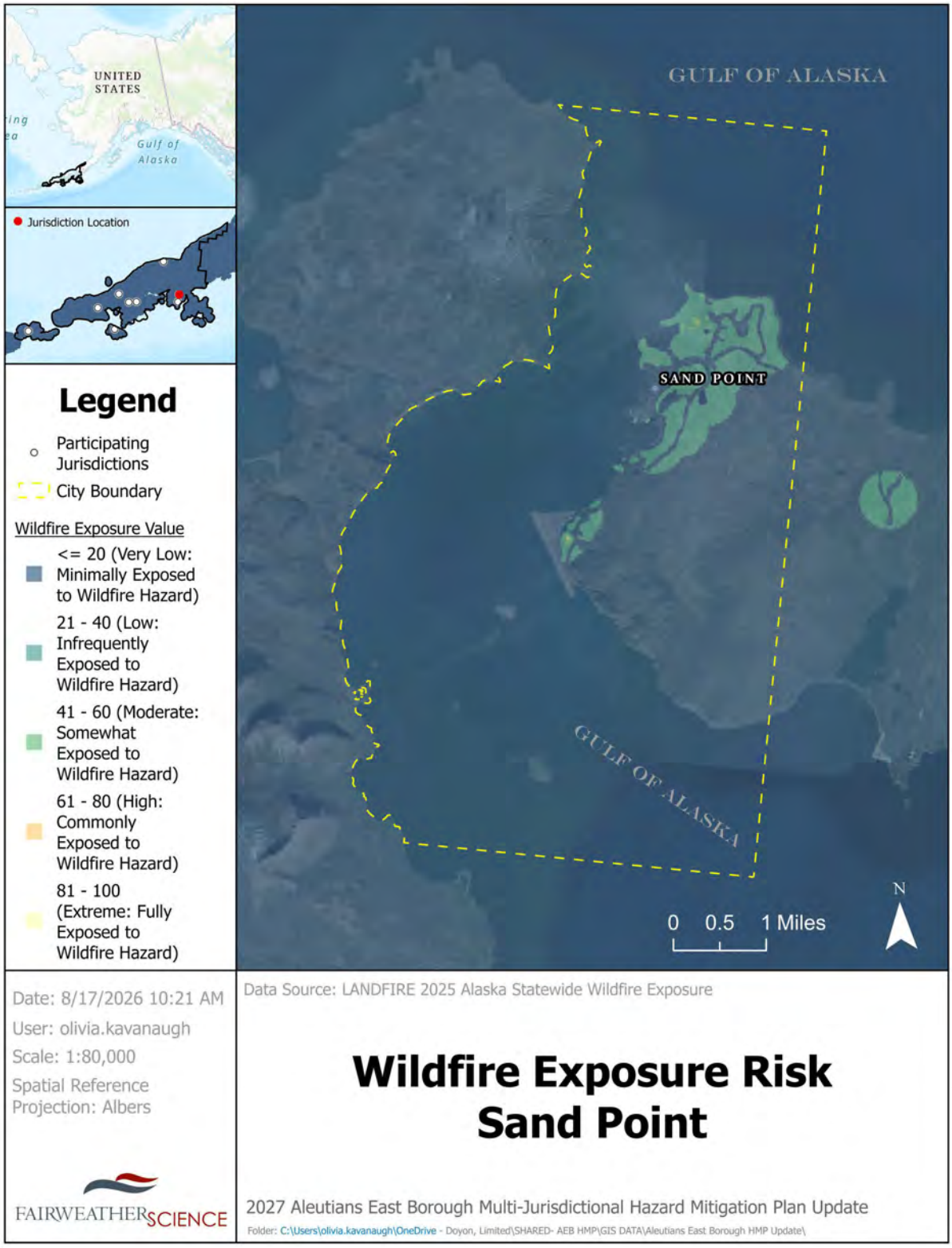



**Figure J-17- Sand Point Wildfire Exposure Risk**

#### J.4.1.12.2 History

Table J-4 lists historical fires in and around Sand Point from 1939 to December 2025. None of these fires had a confirmed natural cause due to lightning and were all human-caused or of unknown origin (AICC 2026). Locations of these events are shown in Figure J-18.

There have been no State or Federal disaster declarations in Sand Point due to wildfires.

The City of Sand Point Planning Team reported that when it is dry, fires are easily started.

**Table J-4- Historical Wildfires in and around Sand Point (1939 - December 2025)**

| Discovery Date | Name | Prescribed Fire? | Latitude | Longitude | Estimated Total Acres | Cause |
|---|---|---|---|---|---|---|
| 1965-04-18 | Unga Island | No | 55.33333 | -160.55 | 320 | Human- Recreation |
| 1996-05-18 | Popof | No | 55.31667 | -160.5 | 30 | Cooking Fire |
| 2010-05-25 | Sand Point | No | 55.33389 | -160.491 | 3.5 | Human |
| 2019-07-04 | Unga Island | No | 55.2693 | -160.675 | 0.1 | Investigated but cause Undetermined |
| 2022-05-12 | Danger Point | No | 55.34275 | -160.435 | 70.4 | Human- Debris Burning |

Source: AICC 2026

During the 2022 Danger Point fire that burned 70 acres, the City had to call in plane assistance and fire jumpers to help extinguish the fire. The fire occurred in an odd part of town and was burning down a cliffside, which made the firefighting efforts complex.

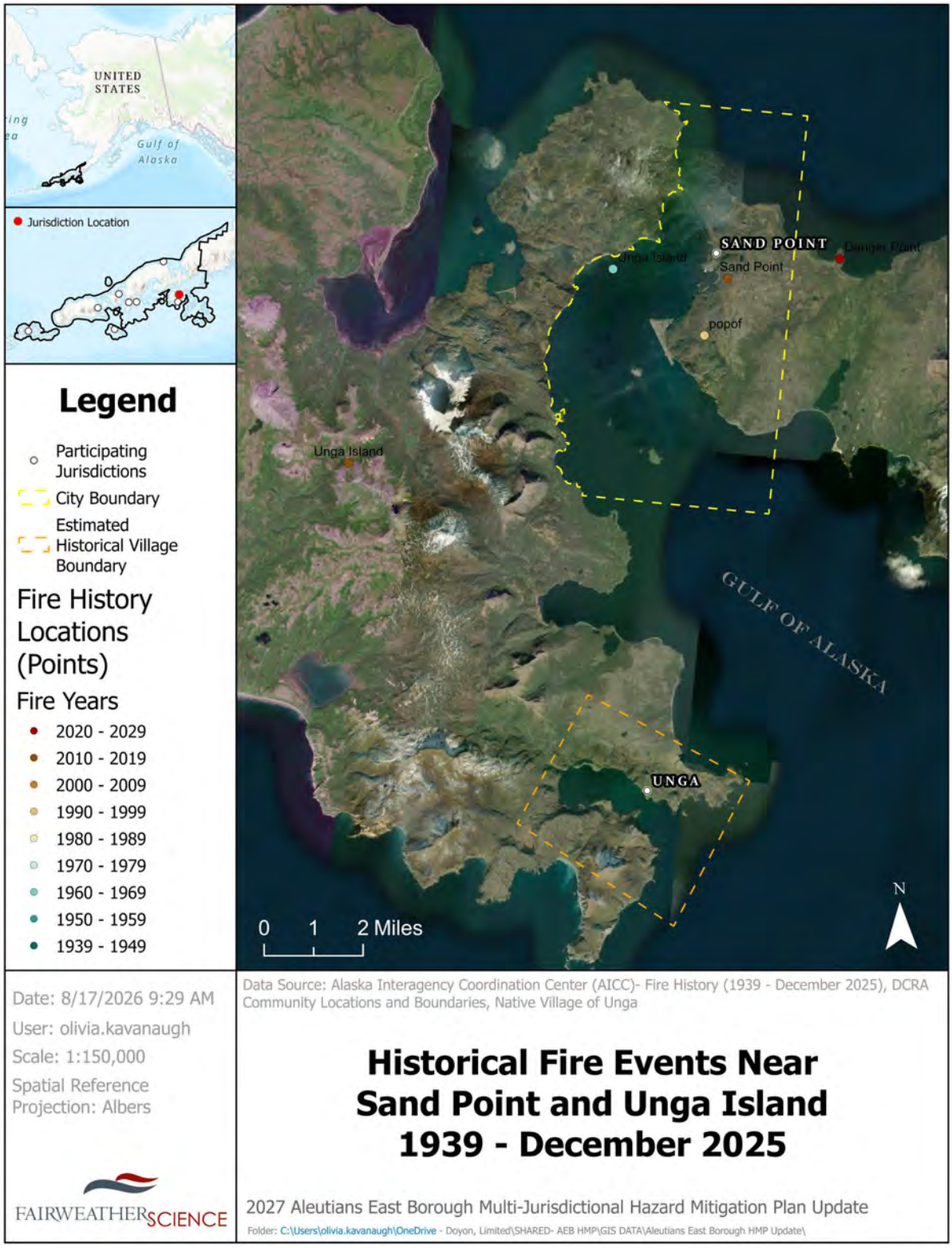



**Figure J-18- Historical Fire Events Near Sand Point and Unga Island**

#### J.4.1.12.3 Extent (Magnitude and Severity)

Wildfire can destroy vegetation, negatively impact air quality, and leave land scarring that could increase the risk of landslides, flood, and sediment deterioration/land destabilization.

The largest fire near Sand Point burned 320 acres on Unga Island in April 1965. This fire was due to human recreation. The most recent fire, *Danger Point Fire*, occurred in May 2022 and burned 70.4 acres east of city limits. This fire was due to human negligence in debris burning.

Based on the extent of past wildfire events and the criteria identified in Table 5 of the Base Plan, the extent of wildfire in Sand Point is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### J.4.1.12.4 Impact

There are no recorded historical impacts of wildfire in Sand Point.

In the future, impacts from wildfire could destroy homes, subsistence resources such as berries or other edible plants, and threaten lives.

Wildland fires can cause air transportation impacts including damage to structures that support air travel and fire fighting equipment and personnel. Smoke from wildland and urban fires can disrupt air transportation and in extreme scenarios, fire can damage runway areas making them not suitable for aircraft arrivals and departures.

| | Description of Impact |
|---|---|
| Geography/Land | The largest fire near Sand Point burned 320 acres on Unga Island in April 1965. This fire was due to human recreation. The most recent fire, Danger Point Fire, occurred in May 2022 and burned 70.4 acres east of city limits. This fire was due to human negligence in debris burning. |
| Infrastructure | The City of Sand Point Planning Team did not report specific previous wildfire impacts to infrastructure in Sand Point. |
| People | The City of Sand Point Planning Team did not report specific previous wildfire impacts to people in Sand Point. |
| Utilities | The City of Sand Point Planning Team did not report specific previous wildfire impacts to utilities in Sand Point. |
| Transportation | The City of Sand Point Planning Team did not report specific previous wildfire impacts to transportation in Sand Point. |
| Economy | The City of Sand Point Planning Team did not report specific previous economic wildfire impacts in Sand Point. |
| Subsistence Resources | The City of Sand Point Planning Team did not report specific previous wildfire impacts to subsistence resources in Sand Point. |

#### J.4.1.12.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Sand Point will experience a wildfire event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### J.4.1.12.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of wildland fires in the Sand Point Planning Area is not anticipated to change in respect to future climate conditions. |
| Location | The location of wildland fires in the Sand Point Planning Area is anticipated to change slightly in respect to future climate conditions, as some areas see a higher likelihood of burning than in the past. Most of these areas are far from communities and infrastructure, with the exception of Sand Point (UAF IARC 2026). |
| Extent (Magnitude and Severity) | Due to future climate conditions, the extent (magnitude and severity) of wildland fires is expected to increase in Alaska in general. Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050 (EPA 2022). In the AEB, more acreage is trending from “less likely to burn” to “more likely to burn” (UAF IARC 2026). |
| Impact | Due to future climate conditions, the impact of wildland fires on the Sand Point Planning Area may increase. More frequent fires due to a change in future conditions may increase the risk of health hazards and low visibility posed by the increase of smoke (AFSC 2025). |
| Probability of Future Events | Future climate conditions within Alaska are likely to result in increased drought and longer fire seasons. Shifts in vegetation will influence the intensity and frequency of fires (IPCC 2019). A warming climate is also projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018).<br>Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050, however this is most applicable to Alaska’s most fire-prone regions in the interior (EPA 2022). |
| Population Patterns | Wildland fires due to future climate conditions are not anticipated to impact population patterns in the Sand Point Planning Area. |
| Land Use Development | Wildland fires due to future climate conditions may influence the location of future development in areas with higher fire risk, although in most areas with year-round populations and infrastructure, the wildfire risk is expected to remain low. |
| Subsistence Resources | A warming climate is projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018). |

## J.4.2 Critical Facilities

**Table J-5- Critical Facilities- City of Sand Point**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | City of Sand Point | Commercial | 0 | Salmon Hatchery | Airport Rd | 55.341478 | -160.485901 | $1,000,000 | | | | | | x | | x | | x | x | x | x | x | |
| 2 | City of Sand Point | Commercial | 0 | Aquaculture Building | 3524 Aiport Rd | 55.341394 | -160.486714 | $1,000,000 | | | | | | x | | x | | x | x | x | x | x | |
| 3 | City of Sand Point | Commercial | 40 | Alaska Commercial Company - Grocery Store | 100 Main St | 55.342159 | -160.496118 | $5,000,000 | | Shumagin Native Corporation | | | | x | | x | | x | | x | x | | |
| 4 | City of Sand Point | Commercial | 0 | Humboldt Quarry | Airport Rd | 55.327829 | -160.501685 | $20,000,000 | | | | | | x | | x | | x | | x | x | | |
| 5 | City of Sand Point | Community | 0 | Swimming Pool | 269 Red Cove Rd | 55.351964 | -160.475965 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 6 | City of Sand Point | Community | 0 | Baseball Field | Red Cove Rd | 55.350567 | -160.475336 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 7 | City of Sand Point | Community | 0 | Unites States Postal Service | 9998 Main St | 55.346554 | -160.487202 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 8 | City of Sand Point | Community | 0 | Cemetery | Pavlof Ave | 55.342559 | -160.496948 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 9 | City of Sand Point | Community | 0 | E.A.T / Teen Center | 1314 Sand point Ave | 55.339947 | -160.497604 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 10 | City of Sand Point | Community | 20 | Church | Baptist Church | 55.340778 | -160.499087 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 11 | City of Sand Point | Community | 20 | Saint Nicholas Church | Sand Point Ave | 55.336742 | -160.497364 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 12 | City of Sand Point | Community | 0 | Trident Cemetery | Tolsytoi Ave | 55.336586 | -160.500552 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 13 | City of Sand Point | Community | 0 | Storage Building | Boat Harbor Rd | 55.334232 | -160.495101 | $50,000 | | | | | | x | | x | | x | x | x | x | | |
| 14 | City of Sand Point | Education | 1000 | Sand Point School | 269 Red Cove Rd | 55.35171 | -160.475684 | $38,379,381 | | | | | | x | | x | | x | | x | x | | |
| 15 | City of Sand Point | Education | 50 | Library | 269 Red Cove Rd | 55.351539 | -160.475433 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 16 | City of Sand Point | Emergency Response | 10 | Volunteer Fire Department | 100 Sand Point Rd | 55.340735 | -160.489419 | $1,000,000 | | | | | | x | | x | | x | x | x | x | x | |
| 17 | City of Sand Point | Emergency Response | 0 | Fire Boat | Small Boat Harbor | 55.334289 | -160.49923 | $50,000 | | | | | | x | | x | | x | x | x | x | | |
| 18 | City of Sand Point | Government | 0 | KSDP Radio Station | 5500 Red Cove Rd | 55.349578 | -160.472725 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 19 | City of Sand Point | Government | 0 | Aleutians East Borough Garage | 4056 Humbolt Ln | 55.344665 | -160.481921 | $50,000 | | | | | | x | | x | | x | | x | x | | |
| 20 | City of Sand Point | Government | 0 | Aleutians East Borough Office | 349 Humbolt Ln | 55.344317 | -160.481758 | $500,000 | | | | | | x | | x | | x | | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | City of Sand Point | Government | 0 | ADF&G Shed | 3000 B Sand Point Ave | 55.345612 | -160.488508 | $50,000 | | | | | | x | | x | | x | | x | x | | |
| 22 | City of Sand Point | Government | 0 | TelAlaska Tower | 100 Sand Point Ave | 55.342566 | -160.494149 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 23 | City of Sand Point | Government | 10 | City Hall | 423 Main St | 55.340985 | -160.498091 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 24 | City of Sand Point | Government | 0 | Sand Point City Public Works | 1000 Airport Rd | 55.335356 | -160.490407 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 25 | City of Sand Point | Government | 0 | USGS Shumagin Magnetic Observatory | 1000 Airport Rd | 55.335274 | -160.491416 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 26 | City of Sand Point | Government | 0 | FAA Building | Airport Rd | 55.317117 | -160.519873 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 27 | City of Sand Point | Government | 0 | ARFF / SREB Building | Airport Rd | 55.316828 | -160.520543 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 28 | City of Sand Point | Government | 0 | FAA Satelitte Communication Dish | Airport Rd | 55.317117 | -160.519873 | $5,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 29 | City of Sand Point | Medical | 20 | Sand Point Community Health Center | 172 Red Cove Rd | 55.347559 | -160.485798 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 30 | City of Sand Point | Transportation | 0 | Robert E. Galovin Small Boat Harbor | | 55.33192077 | -160.5007394 | $60,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 31 | City of Sand Point | Transportation | 5 | Harbor House | | 55.33517231 | -160.4963178 | $50,000 | | | | | | x | | x | | x | x | x | x | | |
| 32 | City of Sand Point | Transportation | 0 | Sand Point Boat Storage | Boat Harbor Rd | 55.336818 | -160.495245 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 33 | City of Sand Point | Transportation | 0 | Trident Seafood Dock | Chichagof Ave | 55.335219 | -160.5011456 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 34 | City of Sand Point | Transportation | 0 | SDP 150 Ton Travel Lift | Boat Harbor Rd | 55.33481 | -160.496252 | $5,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 35 | City of Sand Point | Transportation | 0 | Sand Point New Harbor | Boat Harbor Rd | 55.331477 | -160.501896 | $60,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 36 | City of Sand Point | Transportation | 0 | Big Boat Dock | Boat Harbor Rd | 55.330773 | -160.501556 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 37 | City of Sand Point | Transportation | 0 | Harbor Dock | Boat Harbor Rd | 55.330069 | -160.502449 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 38 | City of Sand Point | Transportation | 0 | Cargo Storage Area | Boat Harbor Rd | 55.330339 | -160.500958 | $50,000 | | | | | | x | | x | | x | x | x | x | | |
| 39 | City of Sand Point | Transportation | 0 | Humboldt Harbor Dock | Boat Harbor Rd | 55.328277 | -160.508622 | $20,000,000 | | | | | | x | | x | | x | | x | x | | |
| 40 | City of Sand Point | Transportation | 0 | Sand Point Ferry Dock | Boat Harbor Rd | 55.331166 | -160.505205 | $20,000,000 | | | | | | x | x | x | | x | x | x | x | | |
| 41 | City of Sand Point | Transportation | 0 | City Dock | Boat Harbor Rd | 55.331877 | -160.503971 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42 | City of Sand Point | Transportation | 0 | Sand Point DOT | 268 Airport Rd | 55.318571 | -160.520728 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 43 | City of Sand Point | Transportation | 0 | Reeve Air Building | Airport Rd | 55.317597 | -160.519826 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 44 | City of Sand Point | Transportation | 20 | Aviation Terminal | Airport Rd | 55.317621 | -160.521373 | $1,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 45 | City of Sand Point | Transportation | 0 | Airport Runway | Airport Rd | 55.318719 | -160.526886 | $50,000,000 | 5,213 x 150 ft pavement path | | | | | x | | x | | x | x | x | x | | |
| 46 | City of Sand Point | Transportation | 0 | Small airplane storage SDP | Airport Rd | 55.316449 | -160.520386 | $5,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 47 | City of Sand Point | Transportation | 0 | SDP Heavy Duty Pier | Small Boat Harbor | 55.332938 | -160.49782 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 48 | City of Sand Point | Utilities | 0 | Landfill | Landfill Access Rd | 55.331253 | -160.429187 | $1,000,000 | | | | | | x | | | | x | | x | x | | |
| 49 | City of Sand Point | Utilities | 0 | Water Pump Station 1 | Nagai Ave | 55.349139 | -160.467973 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 50 | City of Sand Point | Utilities | 0 | Water Pump Station 2 | Nagai Ave | 55.350709 | -160.471488 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 51 | City of Sand Point | Utilities | 0 | City Water Tank | Red Cove Rd | 55.352531 | -160.475049 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 52 | City of Sand Point | Utilities | 0 | Sewage Treatment Plant | Kelly Ave | 55.355667 | -160.486484 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 53 | City of Sand Point | Utilities | 0 | Water Reservoir | Airport Rd | 55.340452 | -160.483747 | $5,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 54 | City of Sand Point | Utilities | 0 | City Pump House | Airport Rd | 55.341579 | -160.48573 | $500,000 | | | | | | x | | x | | x | x | x | x | x | |
| 55 | City of Sand Point | Utilities | 0 | TDX Wind Farm | 3004 Sand Point Ave | 55.343635 | -160.489 | $20,000,000 | | | | | | x | | x | | x | | x | x | | |
| 56 | City of Sand Point | Utilities | 0 | Water Tank 1 | 3010 Sand Point Ave | 55.343239 | -160.490003 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 57 | City of Sand Point | Utilities | 0 | Water Tank 2 | 3016 Sand Point Ave | 55.342519 | -160.490712 | $5,000,000 | | | | | | x | | x | | x | | x | x | x | |
| 58 | City of Sand Point | Utilities | 0 | GCI Satellite Station | Sand Point ave | 55.342622 | -160.484268 | $20,000,000 | | | | | | x | | x | | x | | x | x | | |
| 59 | City of Sand Point | Utilities | 0 | Humboldt Creek Reservoir Dam | | 55.34129 | -160.48566 | $20,000,000 | Dam | City of Sand Point | | | | x | | x | | x | x | x | x | x | |
| 60 | City of Sand Point | Utilities | 0 | New England Fish Co Dam | | 55.31598 | -160.50875 | $20,000,000 | Dam | Shumagin Native Corporation | | | | x | | x | | x | | x | x | x | |
| **Total Occupants:** | | | **1195** | | | **Total Estimated Value:** | | **$527,679,381** | | | | | | | | | | | | | | | |

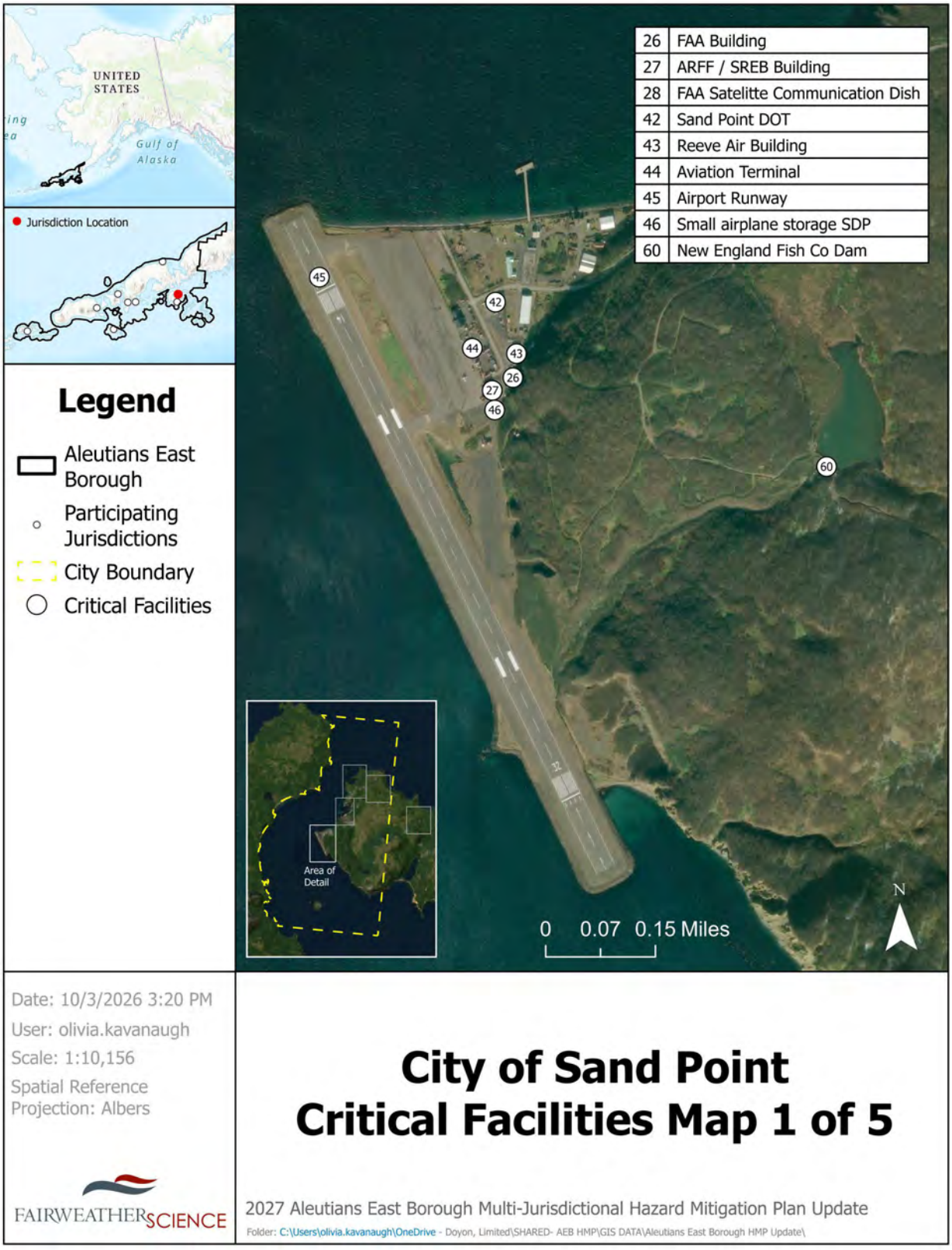



**Figure J-19- City of False Pass Critical Facilities Map 1 of 5**

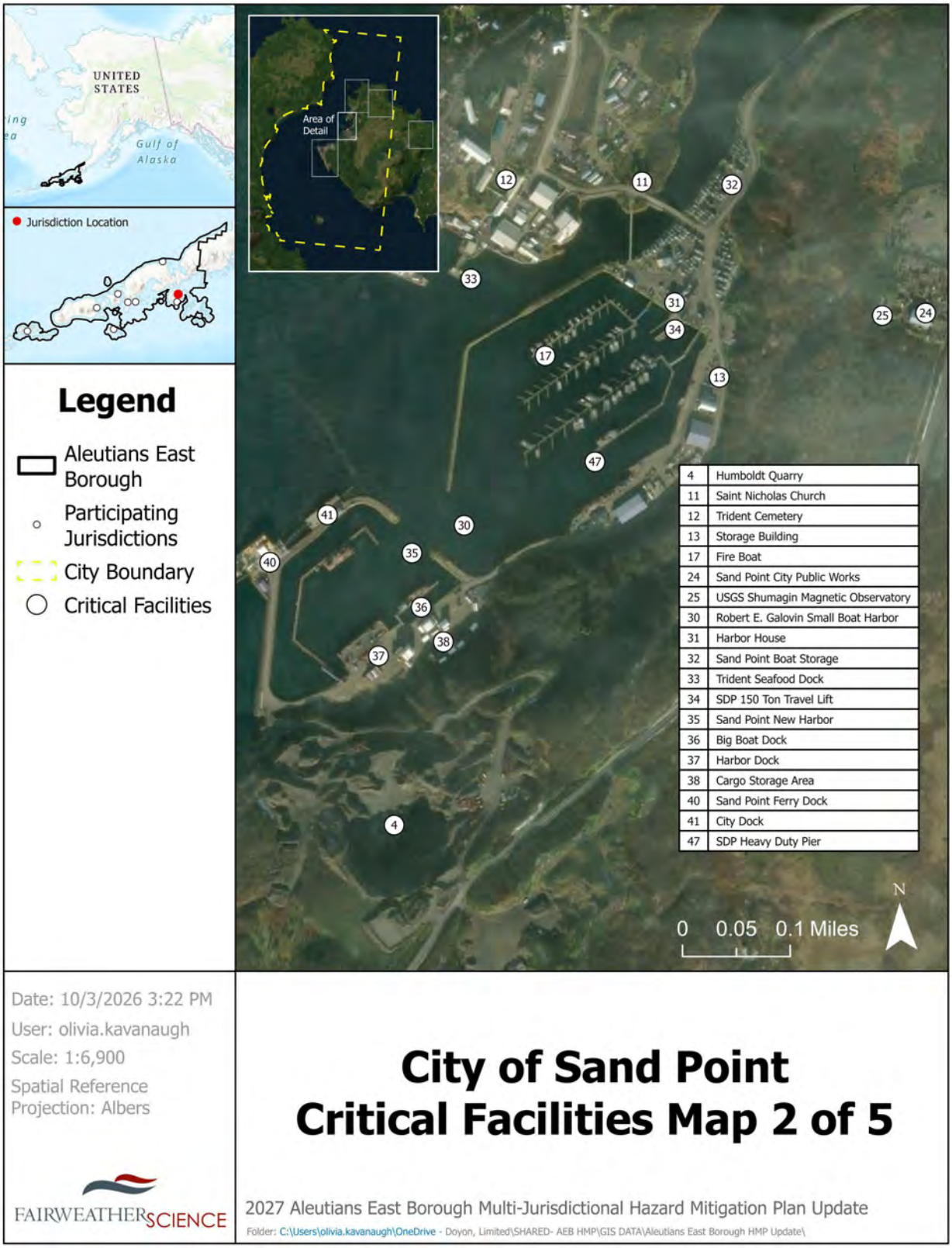



**Figure J-20- City of False Pass Critical Facilities Map 2 of 5**

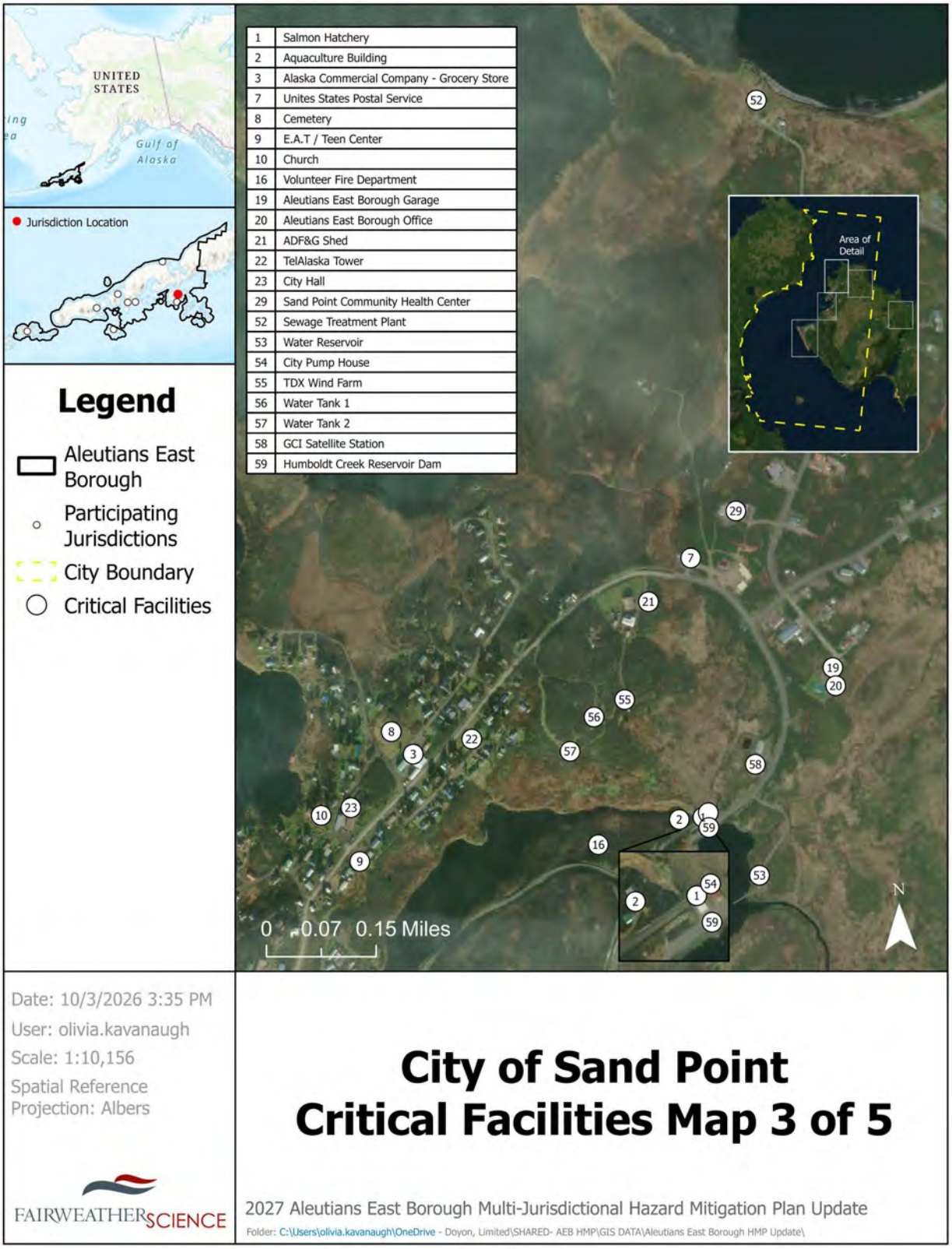



**Figure J-21- City of False Pass Critical Facilities Map 3 of 5**

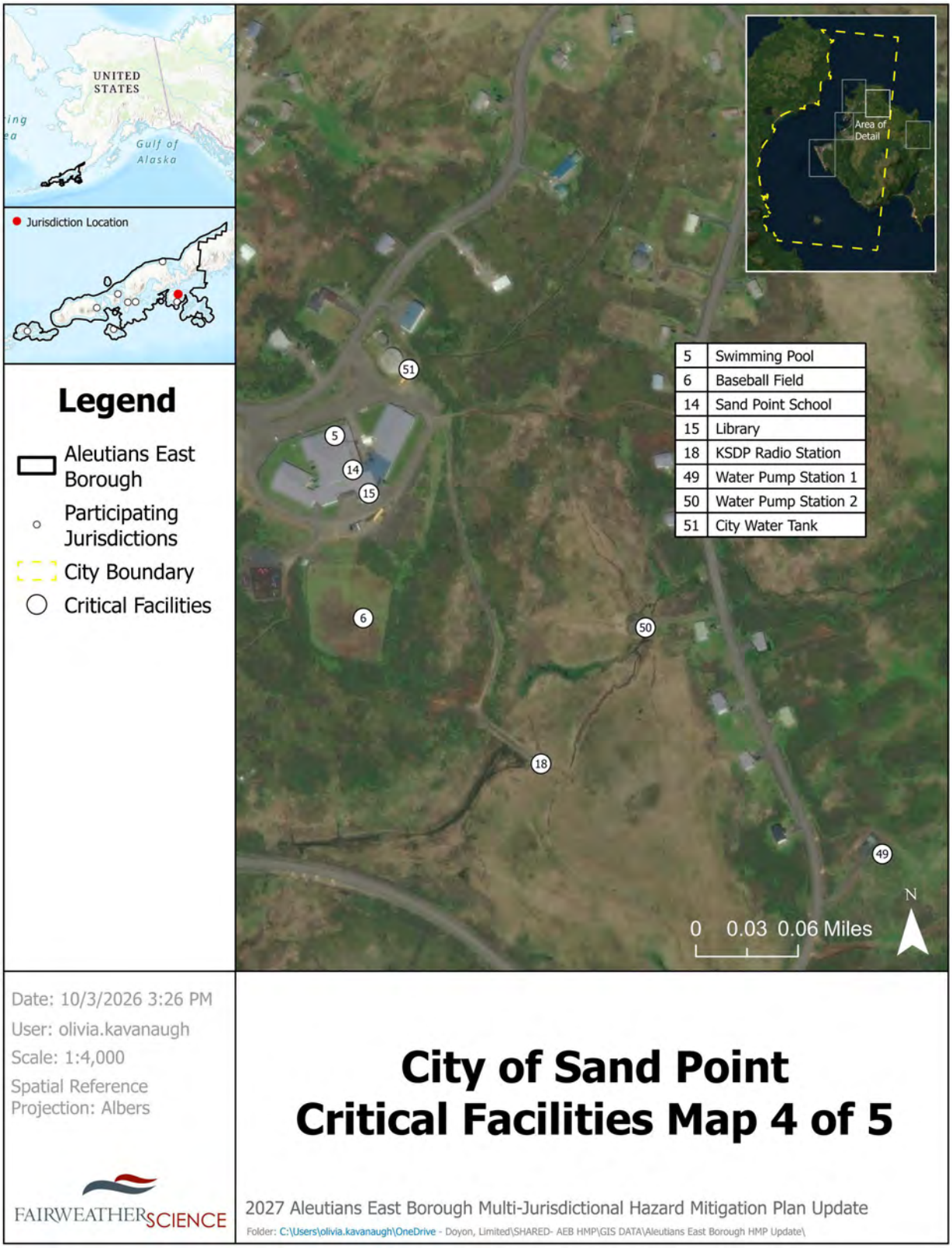



**Figure J-22- City of False Pass Critical Facilities Map 4 of 5**




**Figure J-23- City of False Pass Critical Facilities Map 5 of 5**

## J.4.3 Summary of Vulnerability

**Table J-6- Jurisdictional Summary of Vulnerability- City of Sand Point**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere- Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere- Snow Avalanche | Did not profile this hazard | | | | | |
| Earthquake | 60 | 1195 | $527,679,381 | 237 | 948 | $170,395,480 |
| Sediment Deterioration and Land Destabilization | 1 | 0 | $20,000,000 | 4 | 16 | $2,899,552 |
| Flood | 59 | 1195 | $526,679,381 | 236 | 944 | $169,670,592 |
| Ground Failure/ Landslide | Did not profile this hazard | | | | | |
| Severe Weather | 60 | 1195 | $527,679,381 | 237 | 948 | $170,395,480 |
| Tsunami | 30 | 75 | $338,200,000 | 50 | 200 | $35,831,760 |
| Volcano | 60 | 1195 | $527,679,381 | 237 | 948 | $170,395,480 |
| Wildland Fire | 60 | 1195 | $527,679,381 | 237 | 948 | $170,395,480 |
| Dam Failure | 7 | 10 | $48,500,000 | 1 | 4 | $724,888 |
| Invasive Species | 0 | 0 | $0 | 0 | 0 | $0 |

Sand Point's vulnerability to natural hazards extends beyond potential damage to buildings and infrastructure. The community has a longstanding relationship with fishing and subsistence activities, and hazard impacts may also affect access to subsistence areas, locally harvested resources, and community functions that depend on marine transportation and fisheries. These consequences are not fully represented in the quantitative exposure estimates above.

## J.5 Capability Assessment

***Note: the City of Sand Point does not participate in the National Flood Insurance Program (NFIP).***

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| **Plans** | | |
| Capital Improvements Plan | Yes | |
| Climate Change Adaptation Plan | No | |
| Community Wildfire Protection Plan | No | |
| Comprehensive/Master Plan | Yes | 1970, 1977, 1981, 2004 |
| Continuity of Operations Plan | No | |
| Economic Development Plan | Yes | 2004 Comprehensive Plan does mention Economic Development goals |
| Land Use Plan | Yes | 2003 Harbor Land Use Plan |
| Local Emergency Operations Plan | No | |
| Stormwater Management Plan | No | |
| Transportation Plan | No | |
| **Land Use Planning and Ordinances** | | |
| Acquisition of land for open space and public recreation use | No | |
| Building code | No | |
| Flood insurance rate maps | No | |
| Floodplain ordinance | No | |
| Substantial Damage Plan | No | |
| Natural hazard specific ordinance (stormwater, steep slope, wildfire) | No | |
| Subdivision ordinance | Yes | |
| Zoning ordinance | Yes | |
| **Administrative** | | |
| Chief Building Official | No | |
| Civil Engineer | No | |
| Community Planner | No | |
| Emergency Manager | No | |
| Floodplain Administrator | No | |
| GIS Coordinator | No | |
| Planning Commission | No | There once was and can be appointed by the Mayor per ordinance |

| Capability/Tool | Existing? Yes or No | Comments |
|---|---|---|
| **Technical** | | |
| Grant writing | Yes | |
| Hazard data and information | No | |
| GIS analysis | No | |
| Mutual aid agreements | No | |
| **Funding Resources** | | |
| Capital improvements project funding | Yes | |
| Community Development Block Grant | No | |
| Federal funding programs (non-FEMA) | No | |
| Fees for water, sewer, gas, or electric services | Yes | |
| Impact fees for new development | No | |
| State funding programs | No | |
| Stormwater utility fee | No | |
| **Community Programs/Organizations** | | |
| Community newsletters | No | |
| Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events) | No | |
| Local news | No | |
| Organizations that represent/advocate for/interact with underserved and vulnerable communities/populations | No | Might be some tribal programs that do this |
| Social media | Yes | Facebook and City website |

# J.6 Mitigation Strategy

## J.6.1 Mitigation Goals

The City of Sand Point has identified its goals related to hazard mitigation as:

1. Reduce potential earthquake vulnerability, damage, and loss.
2. Reduce potential tsunami vulnerability, damage, and loss.
3. Reduce potential volcano vulnerability, damage, and loss.
4. Reduce potential severe weather vulnerability, damage, and loss.
5. Reduce potential flooding and erosion vulnerability, damage, and loss.
6. Reduce potential changes in the cryosphere vulnerability, damage, and loss.

## J.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

The City of Sand Point reviewed mitigation actions identified in the 2021 AEB HMP and provided a status update for each action.

- ***Completed***- this action has been completed
- ***In Progress/Ongoing***- this action has been started is currently in-progress or ongoing
- ***Not Started***- this action has not been started

| ID | Action | Status |
|---|---|---|
| **1** | Identify buildings and facilities that must be able to remain operable during and following an earthquake event | Completed |
| **2** | Harden the water and sewer system to be more resilient against seismic events | Not Started |
| **3** | Continue public outreach related to the Tsunami Awareness Program, particularly creating and making community and tsunami brochures readily available | Completed – Public education ongoing, brochures still needed |
| **4** | Install an additional tsunami siren to mitigate human injuries and fatalities during a tsunami event | Not Started |
| **5** | Build a road to a higher elevation in case of a tsunami | Not Started |
| **6** | Construct a heliport | Not Started |
| **7** | Conduct special awareness activities, such as Winter Weather Awareness Week | Not Started |
| **8** | Update, as needed, emergency notification procedures and emergency planning for ashfall events | Not Started |
| **9** | Evaluate water treatment plant to ensure that ashfall can't enter the system | Not Started |

## J.6.3 2027 Mitigation Action Plan

**Table J-7- 2027 Mitigation Action Plan- City of Sand Point**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | All Hazards | Construct a heliport. | L | City Administrator | FAA; FEMA HMA; FEMA HMGP; Denali Commission; AK DOT&PF; USACE | Structure and Infrastructure Projects | Heliport | 5-10 years | B/C: Constructing a heliport would improve emergency access and transportation capability and could support evacuation, medical response, and other essential operations during emergencies.<br>TF: This project is technically feasible but would require site evaluation, aviation standards, engineering, permitting, and sufficient funding. | Existing Plans: Comprehensive Plan; Community Development Plan.<br>Future Plans: Airport Layout Plan; Capital Improvement Plan; Emergency Preparedness Plan |
| **2** | All Hazards | Develop EAP/EOP for hazard events and procedures | L | City Administrator | FEMA EMPG; FEMA HMA; FEMA HMGP; AK DHS&EM; Denali Commission | Plans and Regulations | All | 5-10 years | B/C: An EAP/EOP would establish procedures, responsibilities, and coordination mechanisms for responding to hazard events and help improve overall emergency preparedness.<br>TF: This project is technically feasible using established emergency planning guidance and coordination with local, State, and Federal agencies. | Existing Plans: Comprehensive Plan; Community Development Plan.<br>Future Plans: SCERP/EOP; Emergency Operations/Continuity Plan; Emergency Preparedness Plan; Emergency Response Plan |
| **3** | Dam Failure | Map potential inundation areas of Humboldt Creek Reservoir Dam to better understand where to focus future dam failure mitigation actions | H | City Administrator | FEMA HHPD; FEMA HMA; FEMA HMGP; USACE; AK DNR; AK DHS&EM | Plans and Regulations | Humboldt Creek Reservoir Dam, Other | 0-2 years | B/C: This project would identify areas potentially affected by Humboldt Creek Reservoir Dam failure and help focus future mitigation efforts on vulnerable people, infrastructure, and facilities.<br>TF: This project is technically feasible using available mapping data, dam information, and technical assistance from State and Federal agencies. | Existing Plans: Comprehensive Plan. Future Plans: SCERP/EOP; Dam Safety Plan; Emergency Response Plan; Capital Improvement Plan; Land Use Plan |
| **4** | Dam Failure | Procure funding to repair Humboldt Creek Reservoir Dam to mitigate dam failure risk | H | City Administrator | FEMA HHPD; FEMA HMA; FEMA HMGP; USACE; AK DNR; Denali Commission | Structure and Infrastructure Projects | Humboldt Creek Reservoir Dam, Other | 0-2 years | B/C: Repairing Humboldt Creek Reservoir Dam would reduce the potential for dam failure and associated impacts to people, infrastructure, and essential services.<br>TF: This project is technically feasible using established dam repair methods but would require engineering evaluation, permitting, funding, and qualified contractors. | Existing Plans: Comprehensive Plan.<br>Future Plans: Dam Safety Plan; Capital Improvement Plan; SCERP/EOP; Emergency Response Plan |
| **5** | Earthquake | Harden the water and sewer system to be more resilient against seismic events | L | City Administrator | FEMA HMA; FEMA HMGP; USACE; USDA RD; Denali Commission; AK DHS&EM | Structure and Infrastructure Projects | Water and Sewer System | 3-4 years | B/C: This project would improve the resilience of critical water and sewer infrastructure to seismic events and help maintain essential services following an earthquake.<br>TF: This project is technically feasible using established seismic retrofit and utility hardening methods but may require engineering assessments and specialized construction. | Existing Plans: Comprehensive Plan; Harbor Land Use Plan.<br>Future Plans: SCERP/EOP; Water System/Utility Plan; Capital Improvement Plan; Continuity of Operations Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **6** | Earthquake | Replace the culverts on the airport road that were damaged from recent earthquakes | H | City Administrator | FEMA HMA; FEMA HMGP; FHWA; AK DOT&PF; Denali Commission | Structure and Infrastructure Projects | Airport Road | 0-2 years | B/C: Replacing damaged airport road culverts would improve drainage and transportation reliability and reduce the potential for additional damage from flooding and future seismic events.<br>TF: This project is technically feasible using standard culvert replacement methods but may require engineering assessment, permitting, and coordination with responsible transportation agencies. | Existing Plans: Comprehensive Plan; Community Development Plan.<br>Future Plans: Airport Layout Plan; Transportation Plan; Capital Improvement Plan; SCERP/EOP |
| **7** | Flood | Support efforts to mitigate the impact of high tides on the Harbor Road. | M | City Administrator | FEMA HMA; FEMA HMGP; USACE; NOAA; AK DOT&PF; Denali Commission | Structure and Infrastructure Projects | Harbor Road | 3-4 years | B/C: Mitigating high-tide impacts along Harbor Road would help reduce flooding, erosion, and access disruptions affecting transportation and harbor-related infrastructure.<br>TF: This project is technically feasible using established coastal protection and roadway improvement methods but may require engineering assessment, permitting, and outside funding. | Existing Plans: Comprehensive Plan; Harbor Land Use Plan.<br>Future Plans: Port/Harbor Plan; Capital Improvement Plan; SCERP/EOP; Transportation Plan |
| **8** | Invasive Species | Conduct jurisdiction wide invasive plant inventory to understand extent of invasive species and how to reduce extent | L | City Administrator | USDA; USFWS; AK DEC; ADF&G; FEMA EMPG | Plans and Regulations | N/A | 0-2 years | B/C: A jurisdiction-wide invasive plant inventory would identify the extent and distribution of invasive species and help prioritize future management and mitigation efforts.<br>TF: This project is technically feasible using established survey methods, GIS mapping, and available technical assistance. | Existing Plans: Comprehensive Plan; Community Development Plan.<br>Future Plans: Environmental Plan; Natural Resources Plan; SCERP/EOP; Public Information/Outreach Plan |
| **9** | Sediment Deterioration and Land Destabilization | Pursue funding for erosion solutions based on studies, assessments, and monitoring, particularly related to harbor | M | City Administrator | FEMA HMA; FEMA HMGP; USACE; NOAA; AK DGGS; AK DOT&PF; Denali Commission | Structure and Infrastructure Projects | Harbor, Other | 3-4 years | B/C: Pursuing erosion mitigation would help protect harbor infrastructure and reduce potential damage and service disruptions associated with continued coastal erosion.<br>TF: This project is technically feasible based on identified engineering solutions but may require additional studies, permitting, specialized construction, and outside funding. | Existing Plans: Comprehensive Plan; Harbor Land Use Plan; Community Development Plan.<br>Future Plans: Capital Improvement Plan; Port/Harbor Plan; Coastal Management Plan; SCERP/EOP |
| **10** | Severe weather | Conduct public education activities, especially extreme cold and high wind. | L | City Administrator | FEMA EMPG; FEMA HMA; AK DHS&EM; NOAA; AK DGGS | Education and Awareness Programs | All | 3-4 years | B/C: Public education on extreme cold and high wind would improve community preparedness and help residents reduce potential health, property, and utility impacts.<br>TF: This project is technically feasible through established public outreach methods and State and Federal severe weather guidance. | Existing Plans: Comprehensive Plan; Community Development Plan. Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **11** | Severe weather | Evaluate critical facilities and residences for roof retrofitting to protect against high winds | L | City Administrator | FEMA HMA; FEMA HMGP; USDA RD; Denali Commission; AK DHS&EM | Structure and Infrastructure Projects | All | 5-10 years | B/C: Evaluating critical facilities and residences for roof retrofits would identify vulnerabilities and help reduce potential wind damage to buildings and essential facilities. | Existing Plans: Comprehensive Plan; Community Development Plan.<br>Future Plans: SCERP/EOP; Capital |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | TF: This project is technically feasible using established building assessment and wind-resistance methods but may require engineering evaluation and funding for identified improvements. | Improvement Plan; Facilities Management Plan |
| **12** | Severe weather | Support hardening water utilities to prevent from freezing during cold weather at critical facilities and residences | M | City Administrator | FEMA HMA; FEMA HMGP; USDA RD; USDA RUS; Denali Commission; AK DHS&EM | Structure and Infrastructure Projects | Water Utilities | 0-2 years | B/C: Hardening water utilities against freezing would help maintain reliable water service and reduce damage to critical systems and residential infrastructure during extreme cold. TF: This project is technically feasible using established insulation, heat-tracing, and other freeze-protection methods but may require site-specific evaluation and maintenance. | Existing Plans: Comprehensive Plan; Community Development Plan. Future Plans: Water System/Utility Plan; SCERP/EOP; Capital Improvement Plan; Continuity of Operations Plan |
| **13** | Tsunami | Continue public outreach related to the Tsunami Awareness Program, particularly creating and making community and tsunami brochures readily available | H | City Administrator | FEMA EMPG; FEMA HMA; NOAA NTHMP; AK DHS&EM; AK DGGS | Education and Awareness Programs | All | 0-2 years | B/C: Continued tsunami outreach would improve public awareness of tsunami hazards, evacuation procedures, and appropriate protective actions. TF: This project is technically feasible using established public outreach methods, tsunami education materials, and community distribution networks. | Existing Plans: Comprehensive Plan; Community Development Plan.<br><br>Future Plans: SCERP/EOP; Tsunami/Emergency Evacuation Plan; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **14** | Tsunami | Conduct tsunami drills in the schools and for the community | L | City Administrator | FEMA EMPG; FEMA HMA; NOAA NTHMP; AK DHS&EM; AK DGGS | Education and Awareness Programs | All | 0-2 years | B/C: Tsunami drills would improve preparedness by allowing students and community members to practice evacuation procedures and identify potential gaps in response.<br>TF: This project is technically feasible using established tsunami evacuation procedures, community facilities, and emergency management guidance. | Existing Plans: Comprehensive Plan; Community Development Plan. Future Plans: SCERP/EOP; Tsunami/Emergency Evacuation Plan; Emergency Preparedness Plan; School Emergency Operations Plan; Public Information/Outreach Plan |
| **15** | Volcano | Fund education and outreach efforts related to volcanic ashfall, to possibly include "kits" with protective materials, masks, air filters, etc. | M | City Administrator | FEMA EMPG; FEMA HMA; USGS/AVO; AK DHS&EM; AK DEC; ANTHC | Education and Awareness Programs | All | 0-2 years | B/C: Volcanic ashfall education and preparedness kits would help residents protect their health, vehicles, homes, and essential equipment during an ashfall event.<br>TF: This project is technically feasible using established ashfall preparedness guidance and commercially available protective materials. | Existing Plans: Comprehensive Plan; Community Development Plan.<br><br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **16** | Volcano | Continue to support public education and outreach materials to mitigate impacts from volcanic eruptions in community | L | City Administrator | FEMA EMPG; FEMA HMA; USGS/AVO; AK DHS&EM; AK DEC | Education and Awareness Programs | All | 0-2 years | B/C: Continued volcanic eruption education would improve community awareness of volcanic hazards and help residents understand appropriate protective and preparedness actions. TF: This project is technically feasible using established public outreach methods and State and Federal volcanic hazard information. | Existing Plans: Comprehensive Plan; Community Development Plan.<br><br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **17** | Wildfire | Install wildfire public warning signs at specific locations to promote awareness and education for the community. | M | City Administrator | FEMA HMA; FEMA EMPG; USFS; AK DNR; AK DHS&EM | Plans and Regulations | All | 0-2 years | B/C: Wildfire warning signs would increase public awareness of wildfire hazards and encourage appropriate | Existing Plans: Comprehensive Plan; Community Development Plan. |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | preparedness and fire prevention actions. TF: This project is technically feasible using standard warning signage and established public outreach methods. | Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **18** | Wildfire | Update fire fighting equipment (fire truck) | H | City Administrator | FEMA HMA; FEMA HMGP; AFG; USDA RD; Denali Commission | Structure and Infrastructure Projects | All | 0-2 years | B/C: Updating firefighting equipment would improve the community's ability to respond to fires and protect people, property, and critical infrastructure.<br>TF: This project is technically feasible using commercially available firefighting equipment but would require appropriate funding, procurement, and routine maintenance. | Existing Plans: Comprehensive Plan; Community Development Plan.<br>Future Plans: Capital Improvement Plan; SCERP/EOP; Emergency Response Plan; Facilities Management Plan |

### J.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Install an additional tsunami siren to mitigate human injuries and fatalities during a tsunami event | One siren is already operational and covers community |
| Build a road to a higher elevation in case of a tsunami Build a road to a higher elevation in case of a tsunami | Not needed- road to landfill and evacuation site at school |
| Conduct special awareness activities, such as Winter Weather Awareness Week | Not a current priority. |
| Update, as needed, emergency notification procedures and emergency planning for ashfall events | Don't need specific ashfall event but changed to EAP/EOP overall development. |
| Evaluate water treatment plant to ensure that ashfall can't enter the system | Shuts the system down if needed |
| Harden airport runway where creek runs parallel to mitigate against runway deterioration from erosion | Not a current priority. |
| Consider the feasibility and scope of establishing a community-based monitoring program for invasive plants, including orange hawkweed, oxeye daisies, and creeping buttercups. | Not a current priority. |
| Continue to support education and outreach materials to distribute to residents about invasive plants, how to recognize them, and how to remove them. | Not a current priority. |
| Replace all windows in critical facilities with triple pane to strengthen buildings to high winds, extreme cold | Not a current priority. |
| Replace all windows in critical facilities with triple pane to strengthen buildings to high winds, extreme cold | Not a current priority. |
| Support construction of sea wall to protect coastal infrastructure from King tides | Not a current priority. |
| Support efforts to protect the airport runway from coastal flooding/storm surge/king tide, such as a sea wall. | Not a current priority. |
| Repair and retrofit critical facilities to be more seismically resilient (particularly the old City Dock) | Not a current priority. |
| Continue to support public education and outreach materials to mitigate impacts of earthquake in community | Not a current priority. |

# J.7 Plan Update

## J.7.1 Changes in Development, including in Hazard-Prone Areas (current and future)

### J.7.1.1 Changes in Development Since 2021

There has been little development in Sand Point between 2021 and 2026, and the City's overall vulnerability to natural hazards has not significantly changed.

### J.7.1.2 Future/Planned Development

The City of Sand Point has no planned or anticipated future development projects within the community.

## J.7.2 Changes in Priorities and Mitigation Efforts

The City's priorities and mitigation efforts in the previous HMP mainly focused on tsunamis, earthquakes, and severe weather.

The City's priorities and goals in this HMP shift towards brick-and-mortar mitigation projects. The highest priority for the City is repairing facilities and infrastructure that were damaged by earthquakes, including the culverts associated with the Humboldt Creek Dam.

# J.8 Plan Maintenance

## J.8.1 Planning Team MJHMP Maintenance Commitment

The City of Sand Point is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.6.

The City of Sand Point is committed to annually reviewing the Plan and City staff will work to complete their review responsibilities.

## J.8.2 Continued Public Involvement

The City of Sand Point is dedicated to continued public involvement over the next five years.

The City of Sand Point will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2032.

Future engagement should also provide opportunities for Tribal citizens and other community knowledge holders to identify new local observations, environmental changes, subsistence-related impacts, traditional access concerns, and other knowledge relevant to hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where Indigenous Knowledge or other community-provided information is considered for incorporation into the MJHMP, appropriate attention should be given to Tribal review, attribution, sensitivity, and preferences regarding public disclosure.

## J.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The City of Sand Point jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The City Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### J.8.3.1.1 Implementing

Upon adoption of the Plan, the City of Sand Point will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The City will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### J.8.3.1.2 Monitoring

The City of Sand Point will monitor the progress of mitigation actions on an annual basis. The City Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### J.8.3.1.3 Evaluating

The City of Sand Point will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

#### J.8.3.1.4 Updating

The City of Sand Point will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.6(c)(4)(i). The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Annual reviews should also consider whether new Indigenous Knowledge, local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

Figure J-24 provides a visual of the HMP plan maintenance activities per year.

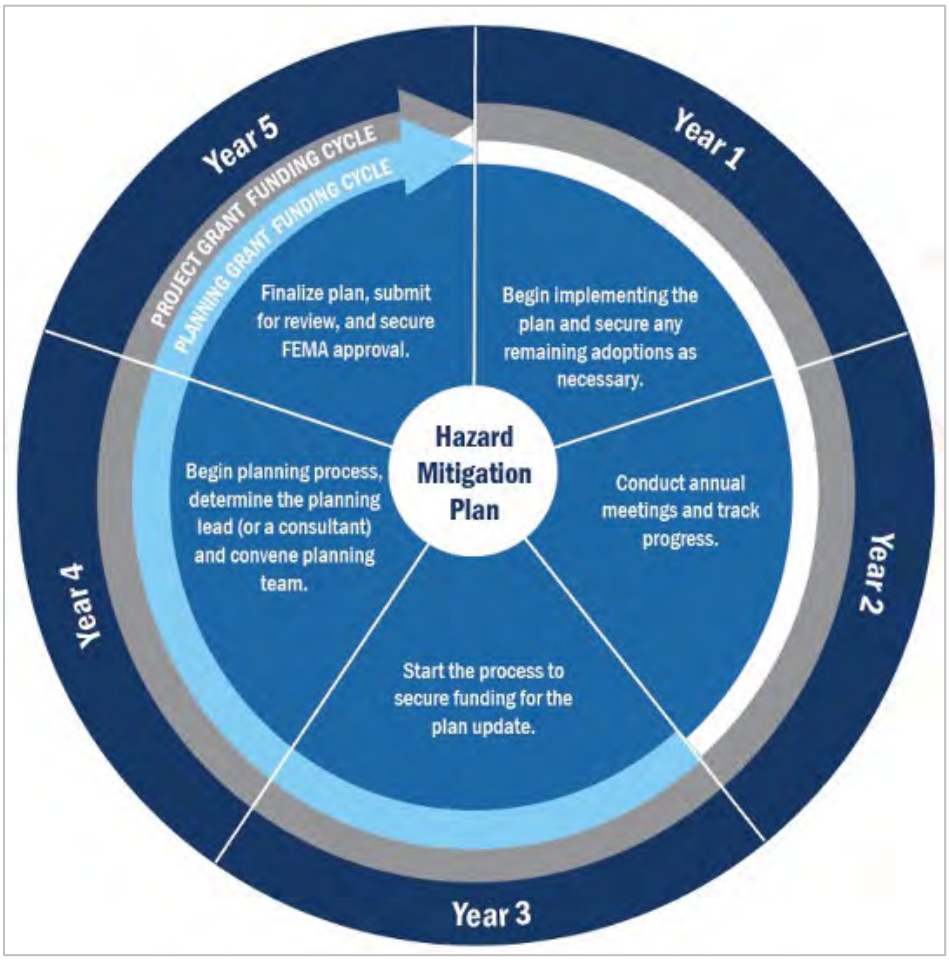



**Figure J-24- HMP Update Schedule**

## J.8.4 Plan Integration

The City of Sand Point will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other planning and implementation processes, when appropriate.

The City will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the City's comprehensive and land use planning processes, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects.

As the plan is implemented, the City of Sand Point will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## J.9 Plan Adoption

The City of Sand Point formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

[insert signed adoption resolution]

# K. Qagan Tayagungin Tribe of Sand Point



Photo Credit: City of Sand Point

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# K.1 Planning Team and Tribal Definition of Public

## K.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **James Smith** | Administration |
| **Debi Schmit** | Administration |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

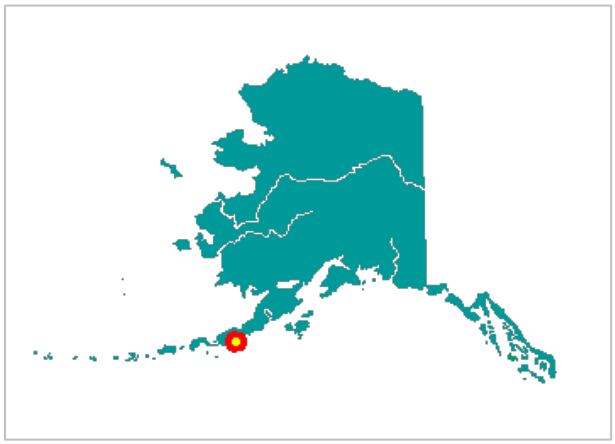
## K.1.2 Tribal Definition of Public

For this planning process, the Qagan Tayagungin Tribe of Sand Point defines the “public” as enrolled Tribal citizens, residents of Sand Point, local businesses and employers, partner governments and organizations, and other individuals with knowledge of or an interest in hazards affecting the community. All community residents may complete surveys and comment on drafts, while the Tribal Council retains authority to adopt the plan for the Tribe.

This definition ensures that anyone who lives or works within the community, as well as enrolled Tribal Members residing outside the community, is eligible to attend and participate in the public involvement portion of the HMP Update planning process.

# K.2 Community Profile

## K.2.1 Location and Geography



The Qagan Tayagungin Tribe of Sand Point is a federally recognized Aleut tribal government based in the City of Sand Point on Popof Island in the Shumagin Islands of the Aleutians East Borough, Alaska. Sand Point is located on the northwestern portion of Popof Island, approximately five miles south of the Alaska Peninsula and approximately 570 miles southwest of Anchorage. The community is situated along Humboldt Harbor and Popof Strait, providing direct access to the surrounding marine environment. The Tribe's administrative headquarters are in Sand Point, which serves as the primary community and population center for its membership.

Popof Island is approximately 10 miles long and 5 miles wide and is characterized by rugged, treeless terrain typical of the Aleutian region. Vegetation consists primarily of alder and willow shrubs, alpine tundra, grasses, sedges, mosses, and other low-growing vegetation. The island contains numerous valleys, streams, wetlands, coastal areas, and upland terrain. Wildlife resources are abundant, including marine mammals, seabirds, fish, and terrestrial species. The island also supports a herd of bison managed by the Shumagin Corporation.

Sand Point is highly dependent on marine and air transportation because of its remote location and lack of road connections to the Alaska mainland. The community's harbor and surrounding waters are central to transportation, commercial fishing, subsistence activities, and access to other communities within the Aleutians East Borough. The surrounding marine environment provides important fish and wildlife resources that support the cultural and subsistence practices of the Qagan Tayagungin people. The Tribe's constitution identifies its ancestral and cultural connections with the Shumagin, Sanak, and Pavlof Islands.

For hazard mitigation planning purposes, the Qagan Tayagungin Tribe's geographic setting creates exposure to coastal storms, high winds, heavy precipitation and snowfall, flooding, coastal erosion, earthquakes, tsunamis, and other hazards affecting remote coastal communities. The concentration of tribal members, housing, government services, transportation infrastructure, and economic activity in Sand Point means that hazards affecting the community can have direct impacts on the Tribe and its membership. Geographic isolation and reliance on marine and air transportation can also complicate evacuation, emergency response, delivery of supplies, access to outside assistance, and long-term recovery following a major disaster.

## K.2.2 History

The Qagan Tayagungin Tribe of Sand Point represents the Unangan (Aleut) people whose ancestral homeland includes the Shumagin, Sanak, and Pavlof Islands. The Tribe’s constitution identifies these island groups as the traditional homeland of its people and recognizes shared ancestry, culture, and community identity among Alaska Native residents and descendants of the region. Prior to European contact, Unangan communities relied on the surrounding marine and terrestrial environments for fishing, hunting, gathering, transportation, and trade. European exploration, colonial activity, disease, forced labor, and other disruptions significantly affected Unangan populations and traditional lifeways throughout the Aleutian region.

The modern community of Sand Point developed in the late nineteenth century. A San Francisco fishing company established Sand Point in 1898 as a trading post and cod-fishing station. Early residents included Unangan people from surrounding villages and Scandinavian fishermen. During the early twentieth century, Sand Point also served as a repair and supply center for nearby gold-mining activities. By the 1930s, fish

processing had become the community's dominant economic activity, further establishing Sand Point as a regional commercial and maritime center.

Sand Point's development was closely connected to the growth of commercial fishing and seafood processing. Aleutian Cold Storage constructed a halibut processing plant in 1946, and the community gradually became an important base for fishing vessels operating in the Aleutian region. The St. Nicholas Chapel, constructed in 1933, reflects the community's Russian Orthodox heritage and is listed on the National Register of Historic Places. Sand Point was incorporated as a city in 1966.

The Qagan Tayagungin Tribe of Sand Point is a federally recognized tribal government that continues to serve Unangan people in the community and throughout the region. The Tribe adopted its constitution in 2004, establishing its governing structure, membership provisions, territorial jurisdiction, and authority to provide governmental, cultural, social, economic, educational, and health-related services. Today, the Tribe's activities are centered in Sand Point, where it works to support tribal citizens, preserve cultural traditions, protect subsistence and fish and wildlife interests, and promote the social and economic well-being of its membership.

## K.2.3 Population

The Qagan Tayagungin Tribe of Sand Point represents a substantial portion of the Alaska Native population associated with the Sand Point community. The Tribe reported approximately 770 enrolled members in a 2019 resolution submitted to the National Congress of American Indians. More recent information published by the Tribe describes a membership of more than 900 tribal citizens, indicating that the tribal population has increased since earlier enrollment estimates. Tribal enrollment represents the number of citizens of the Tribe and should not be interpreted as the number of tribal members physically residing in Sand Point.

Sand Point itself had a population of 578 residents according to the 2020 U.S. Census, while the Census-designated Sand Point Alaska Native Village Statistical Area had a population of 536. These geographic areas do not represent the full Qagan Tayagungin tribal population, as tribal citizens may reside outside Sand Point. The Tribe's membership is therefore geographically dispersed, although Sand Point remains the principal community and administrative center for the Tribe.

The Qagan Tayagungin population is predominantly Unangan (Aleut) and maintains strong cultural, family, and subsistence connections to the Shumagin Islands and surrounding region. Tribal citizens participate in the commercial fishing and maritime economy of Sand Point, while subsistence fishing, hunting, gathering, and other traditional activities remain important to the community. The Tribe provides governmental and social services to its membership through its Sand Point-based tribal government.

For hazard mitigation planning purposes, the population exposed to hazards affecting the Qagan Tayagungin Tribe should be considered broader than the number of people physically present within the Tribe's administrative area. Hazards affecting Sand Point can directly affect tribal members through impacts to housing, employment, transportation, utilities, health services, and subsistence resources. Tribal members living outside Sand Point may also experience indirect effects when disasters disrupt access to tribal services, cultural resources, fisheries, or other resources associated with the Tribe's traditional homeland.

## K.2.4 Demographics

the demographics of the Qagan Tayagungin Tribe of Sand Point are majority Alaska Native but not enough data exists to determine the demographics of tribal members of two or more races.

For the whole geography of Sand Point, there is a relatively diverse population with a substantial Alaska Native presence. The 2024 American Community Survey (ACS) 5-year estimates indicate a median age of approximately 42.3 years**,** which is older than both the Aleutians East Borough and Alaska overall. The community has approximately 442 households, with an average household size of about 2.1 persons.

Educational attainment varies within the community. Approximately 90 percent of adults age 25 and older have completed high school or higher**,** while approximately 18 percent have attained a bachelor's degree

or higher**.** About 9.6 percent of the population is foreign-born, and Census data indicate that a portion of households speak languages other than English at home.

Economic conditions are also relevant to hazard mitigation planning. The 2024 ACS estimates Sand Point's median household income at approximately $81,600, with approximately 14.9 percent of residents living below the poverty level**.** Approximately 6.3 percent of the population are veterans.

Sand Point's demographic characteristics should be considered when developing hazard mitigation, preparedness, response, and recovery strategies. Older residents, lower-income households, individuals with disabilities or medical needs, residents with limited transportation options, and households with language or communication barriers may require additional assistance during emergencies. The community's relatively small population and geographic isolation may also affect the availability of local response resources and access to outside assistance.

## K.2.5 Economy

The economy of the Qagan Tayagungin Tribe is closely connected to the broader economy of Sand Point and the Aleutians East Borough. Commercial fishing and seafood processing are the dominant economic activities in Sand Point, which supports one of the largest fishing fleets in the Aleutian region. The community's fishing economy includes salmon, Pacific cod, pollock, halibut, crab, and other marine resources, with seafood processing facilities and marine support services providing employment and supporting businesses throughout the community. Fishing activity also generates municipal revenues through fish-related taxes.

Many Qagan Tayagungin tribal citizens participate directly or indirectly in the commercial fishing industry. The economic importance of fishing extends beyond individual employment and income because the harbor, processing facilities, fuel suppliers, transportation systems, and other maritime services support the broader community. Seasonal fishing and seafood-processing activity also brings a transient workforce to Sand Point, increasing demand for housing, transportation, utilities, and other community services during peak periods.

Subsistence activities provide an additional component of the local economy and remain important to the cultural and economic well-being of Qagan Tayagungin tribal citizens. Residents harvest fish, marine resources, caribou, and other wildlife from the surrounding land and waters. The Tribe also operates social, economic, education, health, environmental, transportation, and employment-related programs that support its membership and, in some cases, the broader Sand Point community.

For hazard mitigation planning purposes, the Tribe's economic exposure is closely tied to the continued availability of commercial and subsistence resources and to the infrastructure that supports them. Damage to the harbor, fishing vessels, seafood-processing facilities, fuel supplies, airport, transportation routes, utilities, or communications systems could disrupt employment and income for tribal citizens and affect the broader community. Coastal storms, flooding, erosion, earthquakes, tsunamis, severe weather, and other hazards could also restrict access to subsistence resources and disrupt the delivery of tribal and community services. Because Sand Point's economy is highly dependent on maritime activity and outside transportation links, prolonged disruptions could have cascading effects on employment, food supplies, fuel availability, and household finances.

## K.2.6 Land Use

Due to the provisions of the ANCSA, the regional and village native corporations received title to property in their traditional lands. The Shumagin Corporation holds title to significant surface lands while The Aleut Corporation holds title to the subsurface resources.

## K.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following jurisdictional-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **2010 & 2021 Aleutians East Borough MJHMP** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **2024 Qagan Tayagungin Tribe of Sand Point Village EPA-Tribal Environmental Plan** | Describes local capacity building, community outreach, and waste management in Sand Point. | Used relevant information to develop the Community Profile and risk assessment. |
| **2005, 2013 Long Range Transportation Plan** | Describes existing transportation system, needs, land use, and comprehensive planning. | Used to inform the community profile, critical facilities and infrastructure for this HMP update. |
| **2004 Comprehensive Community Development Plan** | Provides details on the history, economy, land use, critical facilities, and transportation in Sand Point. | Used relevant information to develop the Community Profile. |
| **Qagan Tayagungin Tribal Council Local Economic Development Plan** | Describes goals to diversify the economy, create employment opportunities, maintain infrastructure and services, build partnerships, revitalize fisheries. | Used to inform the community profile, critical facilities and infrastructure for this HMP update. |

# K.4 Risk Assessment

## K.4.1 Hazards

The Qagan Tayagungin Tribe of Sand Point Planning Team identified the following natural hazards that may impact their geography/community.

- X Changes in the Cryosphere- Sea Ice
- X Changes in the Cryosphere- Snow Avalanche
- X Dam Failure
- ✓ Earthquake
- ✓ Flood
- X Ground Failure/Landslide
- ✓ Invasive Species
- X Land Destabilization
- ✓ Severe Weather
- ✓ Tsunami
- ✓ Volcano
- X Wildland Fire

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere- Sea Ice | Did not profile this hazard. | | |
| Cryosphere- Snow Avalanche | Did not profile this hazard. | | |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>Sand Point frequently experiences earthquakes with a magnitude of 6.0 and greater. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | Did not profile this hazard. | | |
| Flood | 3- Likely | 4- Catastrophic | The Planning Team reports that low-lying waterfront areas in Sand Point have experienced coastal flooding, storm surge, and high tides.<br>The Planning Team reports that low-lying waterfront areas are most impacted by storm events. |
| Ground Failure/ Landslide | Did not profile this hazard. | | |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of Sand Point is susceptible to severe weather events and impacts. The Planning Team reports experiencing coastal storms, dense fog, and high winds. |
| Tsunami/Seiche | 3- Likely | 3- Critical | According to FEMA's National Risk Index, the tsunami risk for Sand Point is Relatively Moderate. According |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | to the State of Alaska DHS&EM, Sand Point has local tsunami potential and a medium risk of distant tsunami potential. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of Sand Point is vulnerable to volcanic eruptions.<br>Volcanic ashfall is the primary volcanic hazard that may impact Sand Point.<br>Sand Point is located in relatively close proximity to many volcanos, which have produced many eruptions over the past century (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, Sand Point has been impacted by a volcanic ashfall event on multiple occasions, with the majority resulting in trace to light ashfall in the community. |
| Wildland Fire | Did not profile this hazard. | | |
| Dam Failure | 2- Possible | 3- Critical | There are two (2) Significant Hazard Potential Dams in Sand Point.<br>Humboldt Creek Reservoir Dam and New England Fish Co Dam, located in Sand Point, have no history of dam failure.<br>Formal dam failure inundation mapping is not available for either dam. |
| Invasive Species | 3- Likely | 2- Limited | Invasive species pose a potential threat to the ecological, economic, and cultural resources of Sand Point and surrounding Popof Island. The community's reliance on marine transportation, air travel, fishing, and freight creates pathways for invasive plants, insects, wildlife, and marine organisms to be introduced through contaminated cargo, equipment, vessels, and fishing gear. Once established, invasive species could displace native species, alter wildlife and marine habitats, affect subsistence and commercial fisheries, and increase costs associated with monitoring and control. |

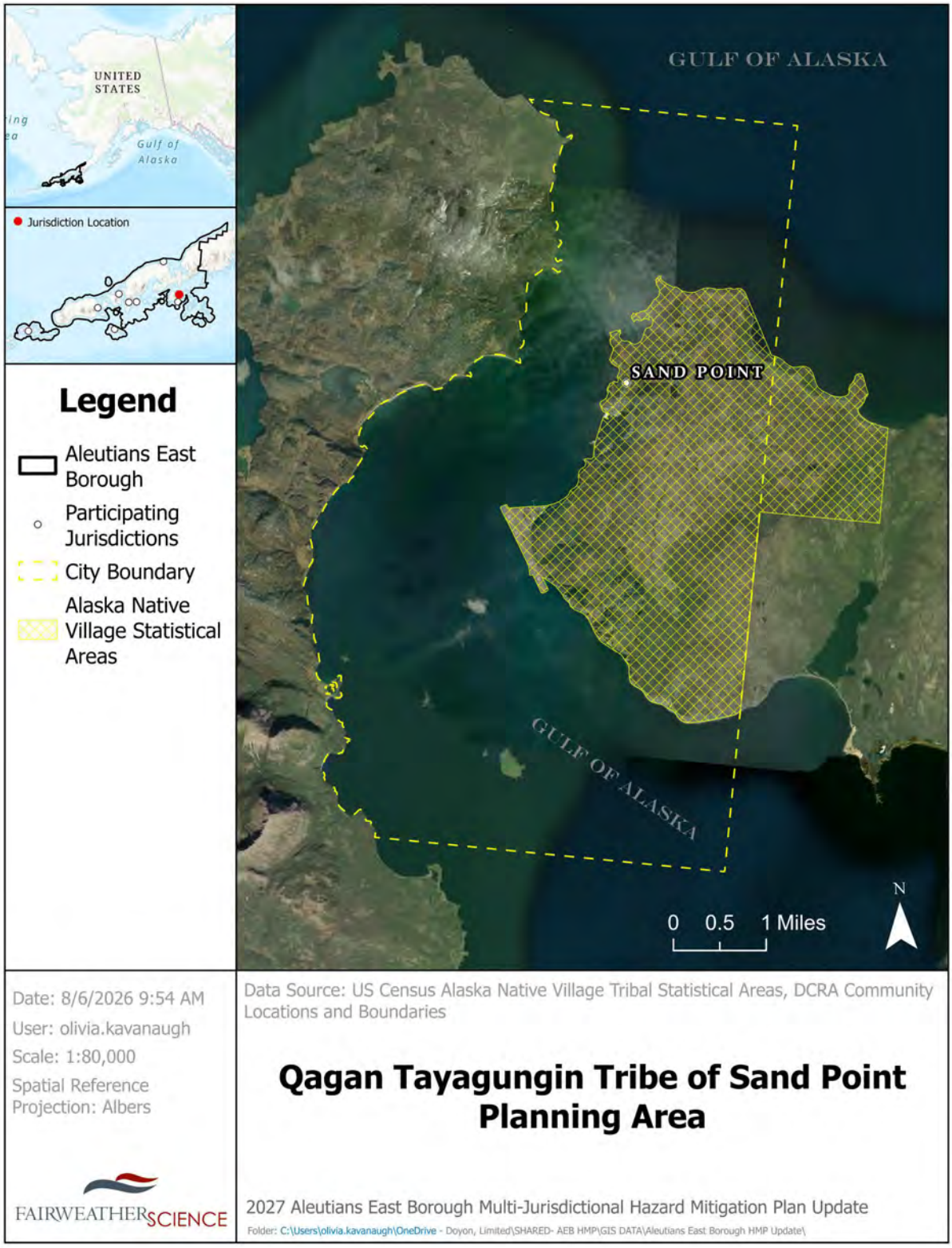



**Figure K-1- Qagan Tayagungin Tribe of Sand Point Planning Area**

#### K.4.1.1 Changes in the Cryosphere – Snow Avalanche

The Qagan Tayagungin Tribe of Sand Point Planning Team did not select this hazard for the MJHMP.

### K.4.1.2 Changes in the Cryosphere – Sea Ice

The Qagan Tayagungin Tribe of Sand Point Planning Team did not select this hazard for the MJHMP.

### K.4.1.3 Dam Failure

#### K.4.1.3.1 Location

There are two dams located in the city limits of Sand Point. Both dams are classified as having Significant Hazard Potential. These dams are the Humboldt Creek Reservoir Dam, and the New England Fish Co Dam. These dams are profiled below.

| NID ID #AK00268 Humbolt Creek Reservoir Dam | |
|---|---|
| Hazard Classification | Significant |
| Owner | City of Sand Point |
| Year Built | Unknown |
| Dam Type | Earth |
| Dam Purpose | Water Supply |
| Length x Height | 395 ft x 19 ft |
| Drainage Area | 4.7 square miles |
| Inspection Frequency | The most recent inspection date is January 21, 2022. The dam is inspected every three years. |
| Downstream Description | There are four culverts in the dam embankment that drain water from the dam, creating a stream that flows into the ocean. Approximately 800 feet downstream of the dam outflow, Humboldt Creek widens to almost 300 feet when reaching the tidal zone. The downstream area is treeless and compromised of tundra plants and low-lying brush. |
| Downstream Area | The Humboldt Creek Reservoir Dam downstream area contains industrial/commercial property, both primary and secondary roads, utilities, and a small boat harbor. |
| Downstream Dams | There are no dams immediately downstream of the Humboldt Creek Reservoir Dam. |
| Downstream Bridges | There are two bridges downstream of the Humboldt Creek Reservoir Dam. One is a pedestrian bridge and a vehicle bridge. The vehicle bridge is on Sand Point Rd, and the pedestrian bridge connects the small boat harbor to the northern peninsula across from the small boat harbor. Airport Road also crosses over the top of the dam. |
| Reservoir Area | The maximum impoundment volume is 55 acre feet, with a reservoir maximum storage surface area of 11 acres. The reservoir is approximately 800 feet long and 360 feet wide. |
| Downstream Development | Sand Point lies approximately 0.4 miles to the west of the dam. In the tidal zone, which is approximately 250 yards beyond the dam outflow, is a large amount of development. There is Sand Point Rd and bridge, the Robert E. Galovin Small Boat Harbor and its pedestrian bridge. There is also the Trident Seafoods Processing plant. |
| Overall assessment of the 2022 inspection | At the time of the most recent inspection, the condition assessment of the dam was rated as Poor**.** The primary reason for the designation was due to a crack in the earthen embankment and buckling of culverts that run through the dam embankment. These are likely due to recent earthquakes occurring in the vicinity of Sand Point. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026, Terra Firma Testing 2022

| NID ID #AK00122 New England Fish Co Dam | |
|---|---|
| Hazard Classification | Significant |
| Owner | Shumagin Corporation |
| Year Built | 1940 |
| Dam Type | Earth |
| Dam Purpose | Water Supply |
| Length x Height | 283 ft x 10 ft |
| Drainage Area | Unknown |
| Inspection Frequency | The most recent inspection is unknown. Inspection frequency is every 5 years. |
| Downstream Description | New England Fish Co Dam is located approximately 0.6 miles from Popof Straight, where the outflow creek terminates after crossing underneath the Sand Point Airport. |
| Downstream Area | The New England Fish Co Dam structure discharges into its outflow creek. The creek flows through a narrow, deep canyon before up against the Sand Point Airport and discharging in Popof Straight. The drainage canyon is heavily brushed with no infrastructure. There is the Old Reservoir to Red Cove Trail to the south of the outflow creek and several unnamed access trail to the north of the access creek. They meet at the top of the dam. |
| Downstream Dams | There are no dams immediately downstream of New England Fish Co Dam. |
| Downstream Bridges | There is one (1) bridge downstream of New England Fish Co Dam. The outflow creek flows up against the east side of the Sand Point Airport runway and then turns south and crosses under a trail bridge. Additionally, there is a motorized trail that runs across the top of the dam. |
| Reservoir Area | New England Fish Co dam has a maximum capacity of 105 acre feet and a surface area of 8.5 acres. The reservoir is approximately 1000 feet long and 580 feet wide. |
| Downstream Development | The major downstream development of New England Fish Co Dam is the Sand Point Airport. The runway butts against the outflow creek, where it then turns sharply parallel to the runway. The airport terminal and support structures are located on the northeast side of the runway, and these structures are protected from potential inundation due to Arch Rock and the surrounding hill between the infrastructure and the outflow creek. |
| General findings of the most recent inspection | A preliminary inspection by the State of Alaska Dam Safety Engineer, based on observations, rated the dam in **Unsatisfactory** Condition. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. Potential inundation of Sand Point Airport runway and Old Reservoir to Red Cove Road could delay or prohibit air transportation to and from Sand Point. |
| Recommended Hazard Potential Classification | The State of Alaska Dam Safety Engineer has recommended classifying this dam as having Significant Hazard Potential. Due to the proximity to the airport, other downstream development and potential loss of life, this recommendation is accurate and justified based on current classification guidelines. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026

#### K.4.1.3.1 History

There is no record of historical dam failure in Sand Point.

Both dams have damage that has been observed. Humboldt Creek Reservoir Dam has damage to its outflow culverts and a large crack in the earthen embankment resulting from several high magnitude earthquakes (Terra Firma Testing 2022). New England Fish Co Dam has been observed to have seepage issues (State of Alaska Dam Safety Engineer 2026).

#### K.4.1.3.2 Extent (Magnitude and Severity)

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

Potential inundation area was assumed to extend 1 mile downstream from the dams, and 0.1 miles in either direction of the outflow route.

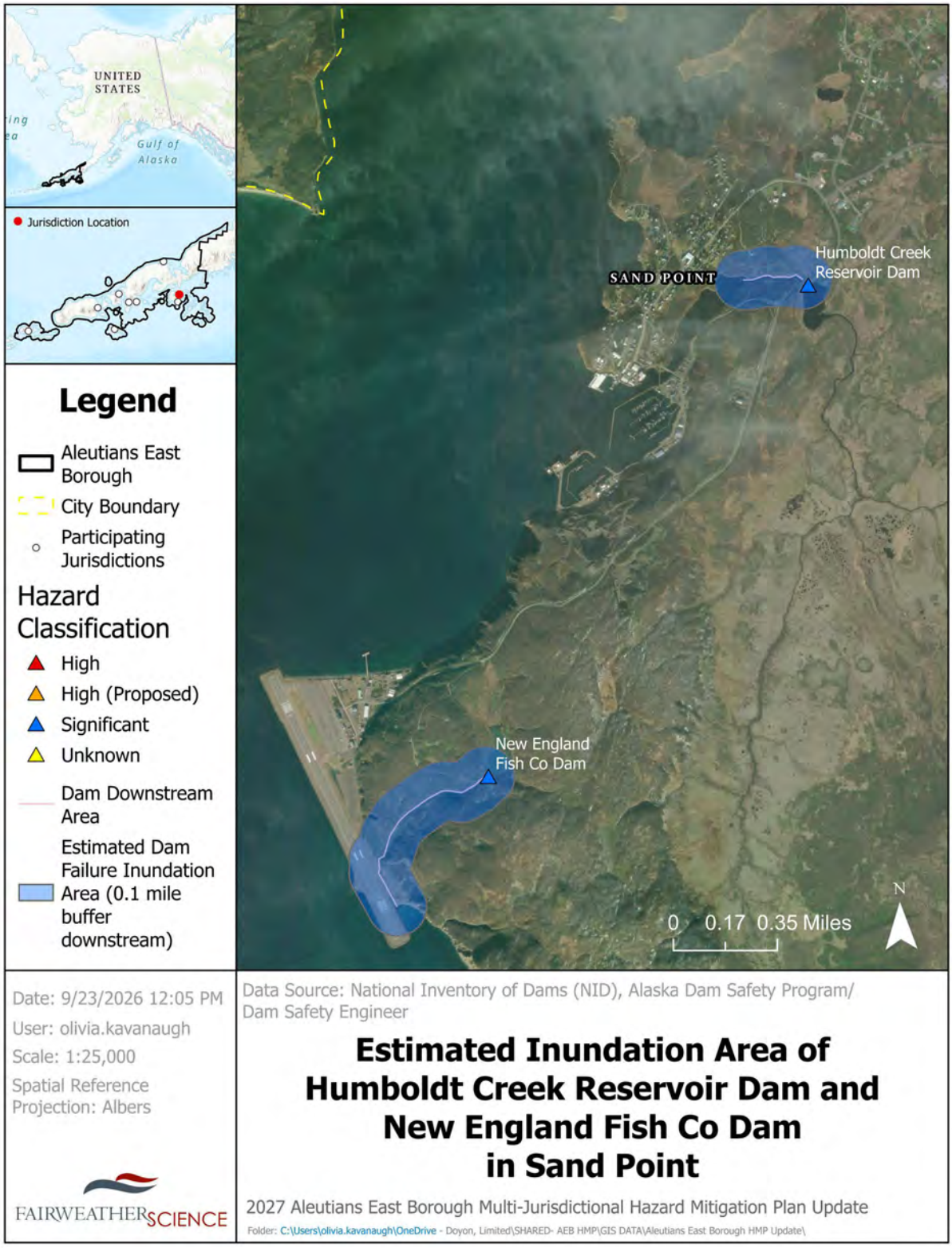



**Figure K-2- Potential Inundation Area of Humboldt Creek Reservoir Dam and New England Fish Co Dam in Sand Point**

Based on estimated inundation area and the criteria identified in Table 5 of the Base Plan, the magnitude and severity of dam failure in Sand Point is **Critical** with multiple deaths and severe injuries; medium shutdown of some critical infrastructure and facilities; 20% to 50% of residential and 10-25% of commercial structures are severely damaged; and large impacts to local operations for long amounts of time

#### K.4.1.3.3 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | The City of Sand Point Planning Team did not report specific previous impacts related to dam failure in this category. |
| Infrastructure | Humboldt Creek Reservoir Dam presumably damaged from earthquakes in the last 6 years. The City of Sand Point also cites damage to the city dock and numerous culverts as being previously damaged by earthquakes. Critical facilities at risk of dam inundation include the Salmon Hatchery, Aquaculture Building, Volunteer Fire Department Building, City Pump House, two Water Tanks, Humboldt Creek Reservoir Dam, and New England Fish Co Dam. |
| People | The City of Sand Point Planning Team did not report specific previous impacts related to dam failure in this category. |
| Utilities | The City of Sand Point Planning Team did not report specific previous impacts related to dam failure in this category. |
| Transportation | The City of Sand Point Planning Team did not report specific previous impacts related to dam failure in this category. |
| Economy | There are no recorded economic impacts from dam failure in Sand Point. |
| Subsistence Resources | The City of Sand Point Planning Team did not report specific previous impacts related to dam failure in this category. |

#### K.4.1.3.4 Probability of Future Events

Based on the criteria listed in Table 6 of the Base Plan and the most recent condition assessments, it is **Possible** that Sand Point will experience a dam failure event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

However, the State of Alaska Dam Safety Engineer warned of “condition creep”, where observational assessments have rated dams more poorly than their most recent available condition rating. If dams in Sand Point continue to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### K.4.1.3.5 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in Sand Point. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in Sand Point. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in Sand Point. A potential outcome of changing climate in Alaska is an |

| Description of Future Conditions | |
|---|---|
| | increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in Sand Point. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in Sand Point. Increased precipitation and frequency of severe weather events could contribute to more stress on dams in the Sand Point Planning Area. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in Sand Point as residents may relocate in and out of potential future inundation areas. Residents of Sand Point may also relocate out of the area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in Sand Point. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted in inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in Sand Point.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes.

### K.4.1.4 Earthquake

#### K.4.1.4.1 Location

The entire geography of Sand Point is vulnerable to earthquakes, due to its location on the Alaska-Aleutian subduction zone.

According to the 2023 State of Alaska HMP, Sand Point is located in an area with the potential of severe perceived shaking from earthquakes (PGA 34 – 65). Perceiving shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. These maps focus on the actual variations in shaking intensity across a region as felt by people and structures.

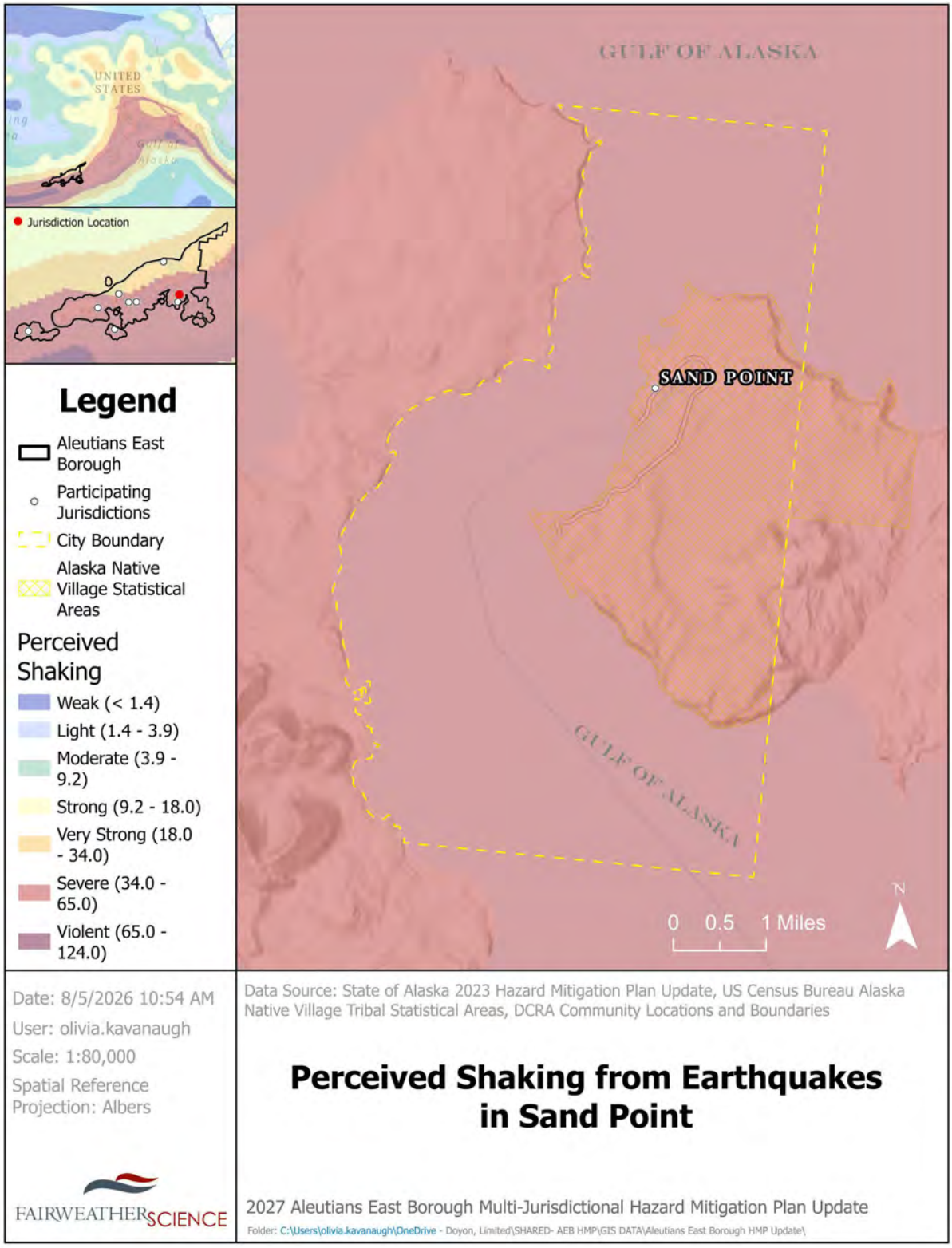



**Figure K-3 - Perceived Shaking from Earthquakes in Sand Point**

#### K.4.1.4.2 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including Sand Point can be found in Table 11 of the Base Plan.

#### K.4.1.4.3 Extent (Magnitude and Severity)

Thousands of earthquakes occur each year along the Aleutian chain. Strong shaking has occurred historically in Sand Point and can damage infrastructure and trigger tsunamis.

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding Sand Point experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Between July 2020 and July 2025, Sand Point experienced 5 major earthquakes between M7.2 and M8.2, which has caused damage to the old city dock which has since been condemned. These earthquakes also resulted in damage to the Humboldt Creek Reservoir Dam and its surrounding culverts.

Based on the extent of past earthquakes events and the criteria identified in Table 5 in the Base Plan, the extent of earthquakes in Sand Point is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### K.4.1.4.4 Impacts

| | Description of Impacts |
|---|---|
| Geography/Land | There have been no recorded earthquake impacts on the geography or land in Sand Point. An earthquake has the potential to trigger landslides, open cracks in the earth, and change the shoreline. |
| Infrastructure | While shaking has been perceived in Sand Point and the traditional lands of the Qagan Tayagungin Tribe of Sand Point, no reports of damage to buildings have been reported. A large earthquake could crack foundations and roadways and flatten buildings and other structures in the case of extremely severe earthquakes. |
| People | No injuries or fatalities due to earthquakes have been reported in Sand Point. Injuries or fatalities are possible due to falling debris. |
| Utilities | There are no recorded impacts on utility systems due to earthquakes in Sand Point or the traditional lands of Qagan Tayagungin Tribe. Earthquakes can damage sewer and water lines, and down telephone poles. |
| Transportation | There have been earthquake-related damage to the boat harbor and dock in Sand Point. This temporarily disrupted marine travel in Sand Point. There is no recorded transportation system impacts due to earthquakes in Sand Point and the traditional lands of the Qagan Tayagungin Tribe. In the future, earthquakes could damage roadways or airport runways, limit road and air travel, or cause a tsunami that could damage boat harbors and other water travel infrastructure. |
| Economy | There have been no recorded economic impacts due to earthquakes in Sand Point. |

| Description of Impacts | |
|---|---|
| Subsistence Resources | There is no recorded earthquake caused impacts on subsistence resources. |

#### K.4.1.4.5 Probability of Future Events

Sand Point is located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing the Tribe.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Highly Likely** that Sand Point will experience an earthquake of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### K.4.1.4.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of earthquake events in Sand Point is not anticipated to change in the future. |
| Location | The location of earthquake events in Sand Point is not anticipated to change in the future. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of earthquakes in Sand Point. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of earthquakes in Sand Point. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future earthquake events in Sand Point. Earthquakes are impossible to predict. |
| Population Patterns | Due to the unknown location of earthquake hazards in Sand Point, it is possible that future earthquakes will impact future population patterns. Depending on the severity of the event, an earthquake in Sand Point could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Future climate conditions are not anticipated to influence Land Use Development due to earthquakes in Sand Point. |
| Subsistence Resources | Future climate conditions are not anticipated to influence earthquake related impacts on subsistence resources in Sand Point. |

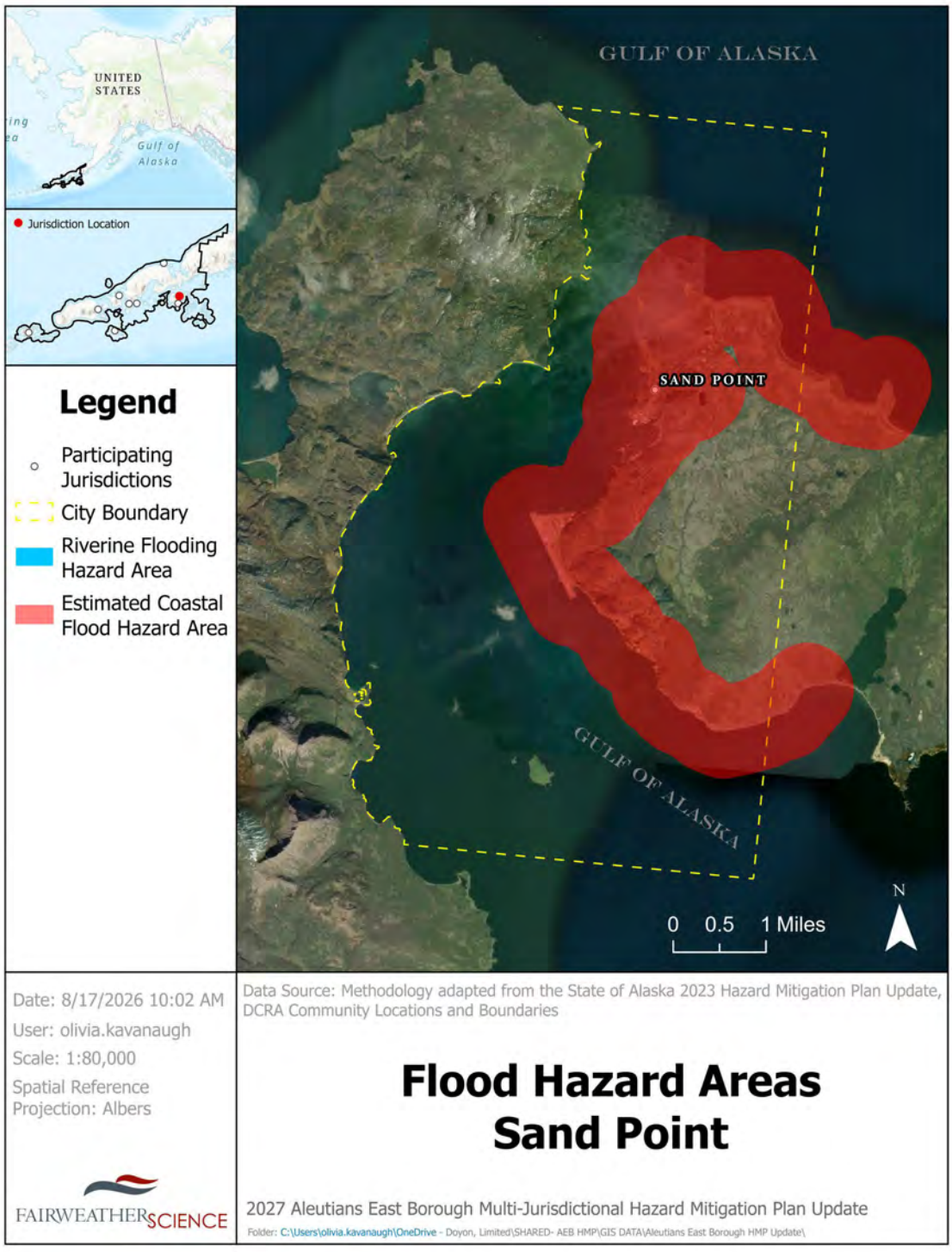
### K.4.1.5 Flood

#### K.4.1.5.1 Location

According to the 2023 State HMP, Sand Point is within the identified Coastal Flooding Area (Figure ). The State of Alaska identifies coastal flooding hazard areas of 0.5 miles from the coastline (DHS&EM 2023).

The Planning Team reported storm surge and king tide flooding impacts in coastal areas, especially at the Sand Point Harbor and boat haul-out area. Generally, coastal and low-lying areas are most vulnerable to flooding events.

Sand Point has minor flooding impacts from rainfall, snowmelt run-off, and storms. Water collects in low terrain depressions and may rise to juts below a structure's first step with no water intrusion on the first floor.




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure K-4- Sand Point Flood Hazard Areas**

#### K.4.1.5.2 History

MHHW represents the average height of the highest daily tide over a long observation period. Coastal flooding is likely when water levels exceed MHHW because it indicates that water has risen above the normal high tide line.

Historic high water level extremes above MHHW which exceeded the 10% annual exceedance probability are shown for Sand Point in the table below. Figure  offers more context for this data.

**Table K-1- Historic Extremes Which Exceeded the 10% Annual Exceedance Probability Levels, Nov 1972 – June 2026**

| Date | Meters above MHHW | Feet above MHHW |
|---|---|---|
| **12/31/1986** | 1.33 | 4 |
| **11/5/2002** | 1.17 | 3.8 |
| **12/22/2022** | 1.41 | 4.6 |
| **1/22/2023** | 1.24 | 4.1 |

Source: NOAA/NOS/Center for Operational Oceanographic Projects and Services 2026

#### K.4.1.5.3 Extent (Magnitude and Severity)

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest has the lowest vulnerability.

Sand Point received a Flood Threat Ranking of 59 out of 63 (Denali Commission 2019). While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking.

NOAA maintains a meteorological station in Sand Point, which was established in September 1972. This station includes wind, air temperature, water temperature, barometric pressure, tsunami WL and microwave ML sensors.

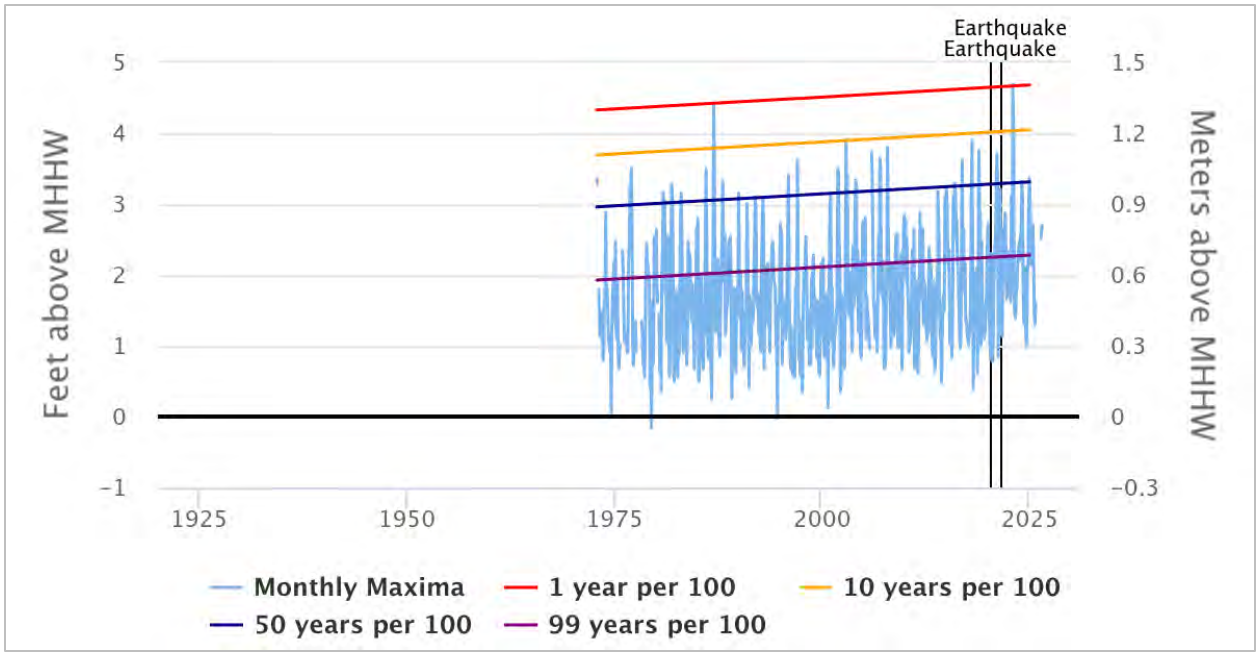


Source: NOAA/NOS/Center for Operational Oceanographic Products and Services 2026

**Figure K-5- Station 9459450 in Sand Point**

Figure  shows monthly highest and lowest water levels, in meters above and below Mean Higher High Water (MHHW). **This data shows that December 2022 had the highest monthly water level above MHHW at 1.41 meters (4.6 feet) in the period from June 1973 to June 2026.**

The lines indicate annual exceedance probability levels. The purple line indicates a very common low water level with a high exceedance probability of 99 years per 100. The red line indicates a very rare high-water level that is only reached 1% of the time – 1 year in 100.




Source: NOAA/NOS/Center for Operational Oceanographic Projects and Services 2026

**Figure K-6- Extreme Water Levels for Sand Point, Alaska (9459450)**

According to this NOAA data source, "the monthly extreme water levels include a Mean Sea Level (MSL) trend of 1.83 millimeters/year with a 95% confidence interval of +/- 0.8 millimeters/year which is equivalent to a change of 0.60 feet in 100 years" (NOAA 2026).

According to the Harbormaster, the City of Sand Point harbor experiences extreme high tides which flood the skiff pad area and occasionally reach the east wall. It is also reported that this flooding has occurred every year since 2022, with some sediment deterioration and land destabilization being reported under the concrete pad for the travel lift.

Based on the extent of past flooding events and the criteria identified in Table 5 in the Base Plan, the extent of flooding in Sand Point is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

### K.4.1.5.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | Flooding can cause land destabilization, sediment transport and scouring of stream banks and coastal embankments, roadway embankments, foundations, footings for bridge piers, and other features.<br><br>Stream bank land destabilization involves the removal of material from the stream bank. When bank land destabilization is excessive, it becomes a concern because it results in loss of streamside vegetation, loss of fish habitat, and loss of land and property. High water flow storm surge floods scour (erode) coastal embankments, coastal protection barriers, and result in infrastructure and residential property losses. Additional impacts can include roadway embankment collapse and foundation exposure, and damaging impacts. Deposition of moved material can impede waterways and threaten community infrastructure.<br><br>**The Planning Team did not report any additional specific previous impacts related to flooding in Sand Point** |

| | Description of Previous Impacts |
|---|---|
| Infrastructure | Floodwater can cause damage to critical facilities, structures, roads, culverts, and other features from high-velocity flow and debris carried by floodwaters. Such debris may also accumulate in culverts, increasing loads on these features or causing overtopping or backwater damage.<br>Water inundation causes tremendous damage to homes and structures. Building materials become saturated with water and can swell, making doors and windows inoperable. Water-saturated building materials become much heavier than they would normally be, which can cause structural damage such as buckling and settling. Materials such as sheet rock can suck up water and lift it with a capillary-type action far above the original level of the flood water.<br>**The Planning Team reported flood-related damage in coastal areas, such as the Sand Point Harbor. The Planning Team did not report specific impacts to infrastructure elsewhere in the traditional lands of the Qagan Tayagungin Tribe of Sand Point.** |
| People | Nationwide, floods result in more deaths than any other natural hazard. Death and injury are potential impacts of severe flood events. Floodwaters can overtop roads, runways, and harbor infrastructure making transportation and emergency egress difficult or impossible.<br>Mildew and mold can quickly set in after a flood, destroying furnishings and causing a health hazard for those with allergies or respiratory conditions. Flood waters usually bring along large quantities of dirt and silt, which are left as deposits when the flood waters recede. Homes and possessions, if not excessively damaged by water, can be damaged by silt deposits.<br>Flooding in the low-lying portion of the communities could cut off portions of the community from critical services located out of the flood zone. For example, road closures, impacts to public safety (access and response capabilities), and limited availability of perishable commodities will impact even those properties not flooded. Because of this, while the actual area subject to flooding is limited, the impact of the flooding could affect the entire community.<br>Flood waters pose a health hazard by distributing contaminants and disease as they travel. Outhouses, fuel tanks, sewers, septic tanks, and livestock yards are all potential sources of disease transported by flood waters, especially if wastewater and sewage infrastructure sustain additional damages. Homes and possessions must be cleaned and sanitized after a flood and may be discarded when the damage is too extensive. Public water supplies can be contaminated by flood waters and must be tested to ensure their safety and potability. Private well systems must also be tested and disinfected after a flood.<br>Lack of a water source is a significant concern for flood victims, especially if the flood has been extensive enough to contaminate the public water supply. In such a case, outside bottled water is at times the only source of clean water.<br>**The Planning Team did not report specific instances of personal injury or death related to flooding in Sand Point.** |
| Utilities | Inundation may cause damage to water and wastewater utilities, power, and communications infrastructure as well as roads, bridges, culverts, and other features.<br>Flooding can cause sewage and hazardous or toxic materials to be released and transported throughout a community. This can happen when wastewater treatment plants are inundated, storage tanks are damaged, or pipelines are severed. |

| Description of Previous Impacts | |
|---|---|
| | Flooding and its resultant land destabilization or water damage can disrupt utilities for prolonged periods of time.<br>**The Planning Team did not report any additional specific previous utility impacts related to flooding in Sand Point** |
| Transportation | Flood events can severely impact transportation systems by overtopping and inundating roadways, airstrips, marine transport infrastructure, and damaging vehicles, boats, ATVs, and other transportation methods. Low lying areas that become inundated can isolate certain parts of a community, impeding movement of people and emergency supplies.<br>**The Planning Team did not report any additional specific previous transportation impacts related to flooding in Sand Point** |
| Economy | Flood events can result in economic losses through business and government facility closure, communications, utility (such as water and sewer), and transportation service disruptions. Floods can result in large expenditures for emergency response and generally disrupt the normal function of a community.<br>**The Planning Team did not report any additional specific previous economic impacts related to flooding in Sand Point** |
| Subsistence Resources | Flood events can impact landforms and ecosystems, potentially disrupting key subsistence species and access to subsistence areas. For example, deposition is the accumulation of soil, silt, and other particles on a river bottom or delta. Deposition can lead to the destruction of fish habitat and present a challenge for navigational purposes. Deposition also reduces channel capacity, resulting in increased flooding or land destabilization. River land destabilization and deposition together often lead to lateral stream movement.<br>**The Planning Team did not report any additional specific previous subsistence impacts related to flooding in Sand Point** |

#### K.4.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Sand Point will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### K.4.1.5.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in the Planning Area as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021). |

| Description of Future Conditions | |
|---|---|
| | As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in the Planning Area is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in the Planning Area, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in the Planning Area. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br><br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br><br>According to the International Panel on Climate Change's 2025 Arctic Report Card, the Aleutian Islands are considered "Sub Arctic". Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021).<br><br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in the Planning Area, however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |
| Population Patterns | It is possible that future flood events will cause changes in population patterns in the Planning Area as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### K.4.1.6 Ground Failure/ Landslide

The Qagan Tayagungin Tribe of Sand Point did not select this hazard as part of the MJHMP.

### K.4.1.7 Invasive Species

#### K.4.1.7.1 Location

The entire natural area surrounding Sand Point is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. Sand Point's location adjacent to a busy coastal port is a possible human-caused pathway in the spread of invasive species in the community. Invasive plant seeds can be transported unintentionally on vessels and cargo, potentially allowing species introduced near developed areas to spread into natural areas.

#### K.4.1.7.1 History

Sand Point has had historical vessel traffic related to the fishing and shipping industry, which can contribute to the spread of invasive species in the region. While there have been no historical occurrences of invasive rat populations or invasive aquatic animals in the community, Sand Point has had a reported invasive plant occurrence, which was identified as the highly invasive Orange Hawkweed (USFWS 2026).

While there are no documented occurrences of invasive plants in Sand Point according to the AKEPIC database, this absence of records may be attributed to limited sampling and survey efforts in the area rather than an absence of invasive species.

#### K.4.1.7.2 Extent (Magnitude and Severity)

While the threat of an invasive species event in Sand Point remains high, previous occurrences and knowledge of the magnitude and severity are currently limited.

According to a City of Sand Point Planning Team member, Orange Hawkweed is commonly seen around town during the months of July and August.

As there are no public-submitted entries of documented invasive species in Sand Point in the AKEPIC database, the total infested acreage in Sand Point is unknown.

Based on previous occurrences and the criteria identified in Table 5 of the Base Plan, the magnitude and severity to Sand Point from invasive species are considered **Limited**.

#### K.4.1.7.3 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of invasive species on the land surrounding Sand Point has been localized non-native plant infestations, which can outcompete native plants and wildlife. |
| Infrastructure | There is limited evidence that invasive species have directly impacted infrastructure in Sand Point. |
| People | While invasive species can affect resources that people depend on, Sand Point has no history of invasive species directly affecting the residents of the community. |
| Utilities | There have been no documented cases of invasive species causing utility disruptions in Sand Point. |
| Transportation | Transportation is identified as a potential pathway for invasive species to spread throughout Sand Point. Due to the nature of invasive species in the community, there is little evidence to show that these species cause direct damage to transportation infrastructure in Sand Point. |
| Economy | There have been no reports of an invasive species infestation resulting in significant economic impacts in Sand Point. |
| Subsistence Resources | Invasive species pose a potential threat to subsistence resources in Sand Point, primarily related to the threat of non-native plants outcompeting native plants that residents rely on for subsistence activities. |

#### K.4.1.7.4 Probability of Future Events

Based on previous occurrences, and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Sand Point will experience an invasive species event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### K.4.1.7.5 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is possible future climate conditions will influence the nature of invasive species in Sand Point. Warmer temperatures and longer growing seasons may allow some invasive species to become established in areas where they don't historically occur. |
| Location | It is likely future climate conditions will influence the location of invasive species in Sand Point. Changes in temperature and precipitation patterns may allow invasive species to expand into new terrestrial and marine areas of Sand Point. |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of invasive species in Sand Point. Future changes may create favorable conditions for certain invasive species, allowing populations to spread at a rapid rate. |
| Impact | It is likely future climate conditions will influence the impacts of invasive species in Sand Point. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of invasive species in Sand Point. As environmental conditions change, areas that were previously unsuitable for certain invasive species may become more favorable for establishment and spread, which increases the probability of future events in Sand Point. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Sand Point. Changes in the distribution and abundance of invasive species may alter the availability of food and habitat relied upon by wildlife and residents of Sand Point. |
| Land Use Development | It is unlikely future climate conditions will influence future land use development in Sand Point. |
| Subsistence Resources | It is likely future climate conditions will influence subsistence resources in Sand Point. Changes in ocean conditions, weather patterns, and species distribution may affect the availability and accessibility of important subsistence resources. The introduction or expansion of invasive species could further impact native species that support subsistence activities in Sand Point. |

### K.4.1.8 Land Destabilization and Sediment Deterioration

The Qagan Tayagungin Tribe of Sand Point Planning Team did not select this hazard for the MJHMP.

### K.4.1.9 Severe Weather

#### K.4.1.9.1 Location

All of Sand Point is vulnerable to severe weather events.

#### K.4.1.9.2 History

Sand Point has a history of high wind events and winter storms.

The Planning Team reported that the winter of 2025-2026 was “one of the worst we’ve had. It was colder than it had ever been”. They also reported a history of freezing rain and heavy snowfall, although it was noted that Sand Point does not receive much snowfall. The Planning Team reported high winds around 75-80mph, with winds reaching 100mph, in Sand Point. The Planning Team reported high wind conditions that occasionally cause tin roofing to come off houses and structures. Temperatures below zero have also been reported, with the 2025-2026 winter season resulting in more than a dozen water pipes in homes freezing up.

#### K.4.1.9.3 Extent (Magnitude and Severity)

Table K-2 shows monthly averages for maximum temperature, minimum temperature, total precipitation, average total snowfall, and snow depth from 1980 to 1994 in Sand Point.

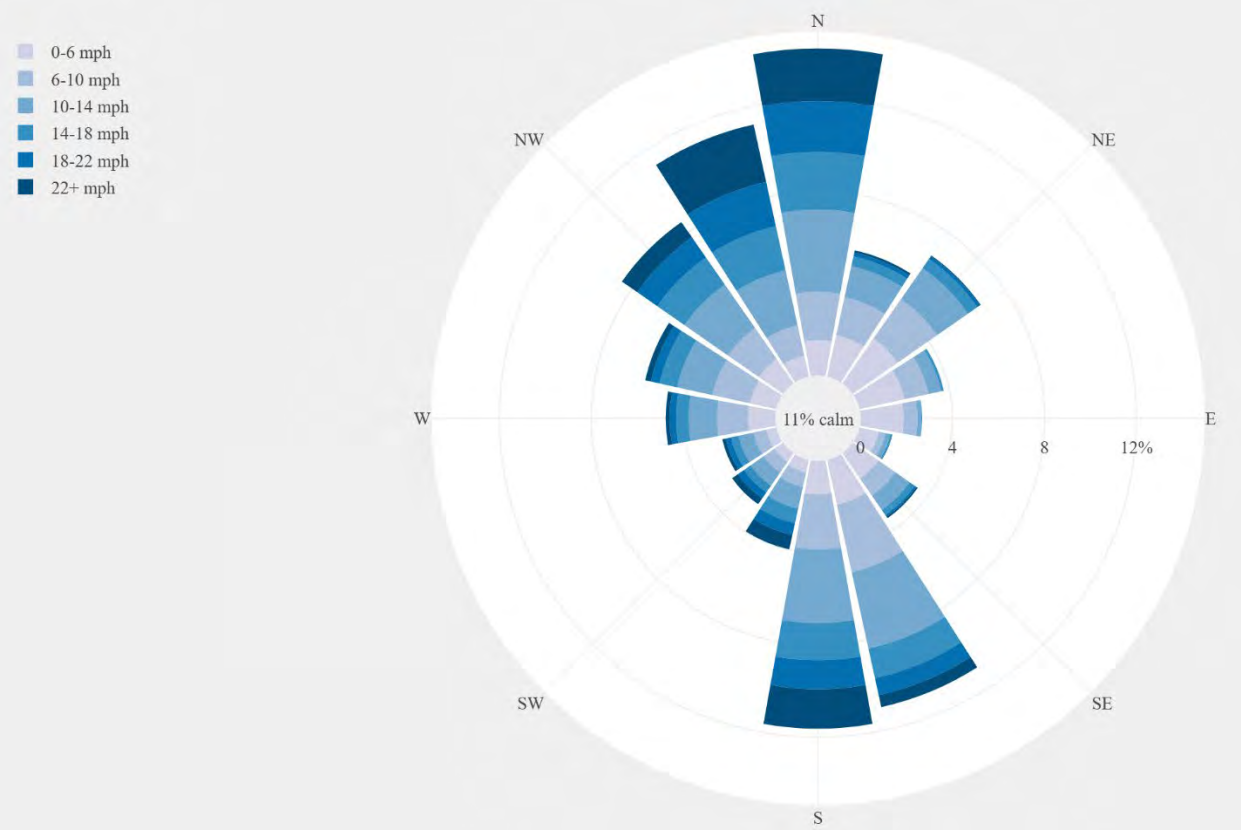
**Table K-2- Monthly Climate Summary 6/1/1980-6/30/1994, Sand Point**

| | Jan | Feb | Mar | April | May | June | July | Aug | Sept | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Avg.Max. Temp (F)** | 36.2 | 34.9 | 37.7 | 39.2 | 45.3 | 51.9 | 57.5 | 57.6 | 53.9 | 46.6 | 41.3 | 38.6 | 45.1 |
| **Avg. Min. Temp (F)** | 29.0 | 27.0 | 28.9 | 30.6 | 36.4 | 41.8 | 46.8 | 48.1 | 44.1 | 37.6 | 33.2 | 31.3 | 36.2 |
| **Avg. Total Precipitation (in.)** | 3.88 | 2.60 | 3.26 | 2.41 | 3.03 | 3.15 | 2.87 | 4.01 | 6.32 | 3.89 | 3.47 | 5.79 | 44.68 |
| **Avg. Total Snowfall (in.)** | 5.6 | 1.8 | 1.5 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 2.0 | 12.9 |
| **Avg. Snow Depth (in.)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: WRCC 2026

The Planning Team reported high winds around 75-80mph, with winds reaching 100mph. The Planning Team also reported temperatures below zero, compounded by wind chill.

Average wind speeds in Sand Point are highest in the winter months, according to the Western Regional Climate Center. Figure  below illustrates average wind speeds and directions at the Sand Point Airport over the course of the year from 1980-2025, demonstrating that wind speeds do reach 22+ mph.




Source: UAF SNAP & WRCC 2025

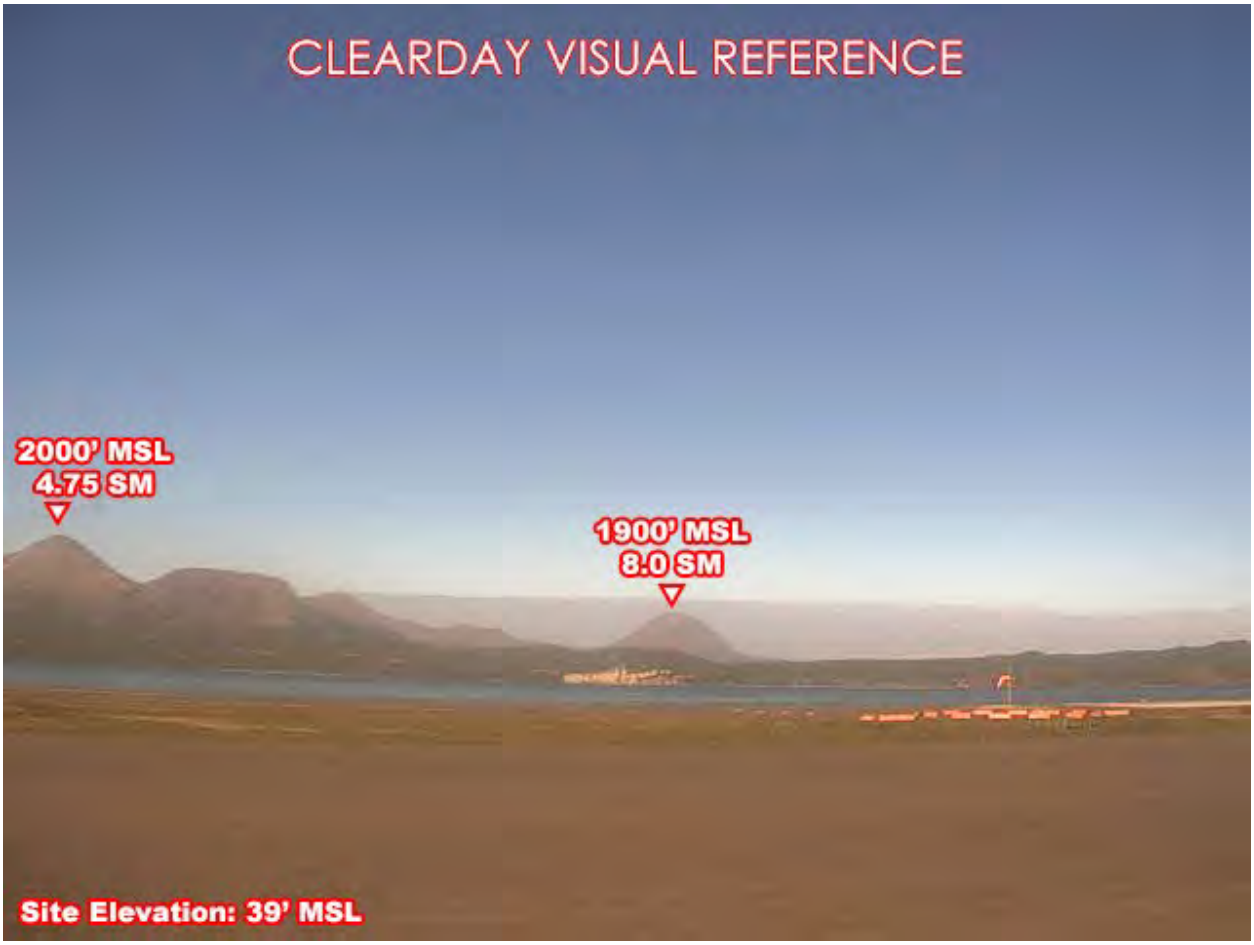
**Figure K-7- Wind Speed/Direction Distribution for Sand Point Airport, 1980-2025**

Dense fog can disrupt travel at the Sand Point Airport. The Federal Aviation Administration monitors weather cameras at the Sand Point Airport. Below are images of an overcast day and a clear day visual reference. These images are from August 13, 2026, and are intended to provide a qualitative visual reference of the impact of weather on visibility at the airport.




Source: FAA WeatherCams 2026

**Figure K-8- Sand Point Airport on 8/13/2025, Facing West**




Source: FAA WeatherCams 2026

**Figure K-9- Sand Point Airport on 8/13/2025, Facing West, Clear Day**

Based on the extent of past severe weather events and the criteria identified in Table 5 in the Base Plan, the extent of severe weather events in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

### K.4.1.9.4 Previous Impacts

| | Description of Previous Impacts |
|---|---|
| Geography/Land | General impacts from severe weather to geography/land include:<br>Dense Fog: Persistent marine fog can contribute to slick conditions on coastal trails and roads.<br>Drought: Drought conditions can impact subsistence resources, ecosystem functions, and increase wildfire risk. Drought can dry out tundra and reduce lake levels.<br>Extreme Cold: Extended cold spells can cause ice buildup on coasts and tundra and potentially increase freeze-thaw damage.<br>Heavy Rain: Heavy rain can cause land destabilization, sediment transport, and flooding. Heavy rain also increases landslide and debris-flow potential in steep terrain. Saturated soil can destabilize slopes.<br>Heavy Snow: Heavy snow can alter flooding and melt patterns, impacting trail access and distribution of flora and fauna. |

| | Description of Previous Impacts |
|---|---|
| | High Winds: High winds drive wave runup, worsening storm impacts such as land destabilization.<br>**The Planning Team did not report any specific previous impacts to geography/land from severe weather events in Sand Point.** |
| Infrastructure | General impacts from severe weather to infrastructure include:<br>Dense Fog: Dense fog can indirectly impact physical infrastructure by causing delays in repairs and reducing safe operation of equipment and infrastructure such as small harbors.<br>Drought: Drought can impact water system intakes and increase wear on community water infrastructure<br>Extreme Cold: Extreme cold can cause infrastructure and home damage when pipes freeze or extreme cold impacts mechanical systems. In extreme cold conditions, frozen pipes, equipment failures, and structural strain can occur more frequently.<br>Heavy Rain: Heavy rain can overwhelm drainage and flood protection systems, causing localized flooding. It can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, bulk fuel storage, docks, landfills, cemeteries, and homes. Freezing rain can cause damage to infrastructure (tree limbs with freezing rain can damage power lines, ice buildup can damage water conveyance systems).<br>Heavy Snow: Heavy snow can load roofs and structures, increasing the risk of damage or collapse.<br>High Winds: High wind can cause infrastructure and home damage, such as damage to roofing, utility lines, docks, and fuel storage.<br>The Planning Team reported damage to roofs of houses and buildings from previous high wind events in Sand Point. |
| People | General impacts from severe weather to people include:<br>Dense Fog: Dense fog can interrupt travel and affect access to critical medical care. Reducing visibility, dense fog can increase the risk of injury, especially in settings such as boat harbors and fishery facilities where operational hazards are already present.<br>Drought: Water shortages can impact drinking water security and increase wildfire risk, presenting risks to human health and safety.<br>Extreme Cold: Extreme cold events pose dangers to human health, including frostbite and hypothermia. Extreme cold can also lead to heating emergencies for residents, such as being without heat for extended periods of time.<br>Heavy Rain: Heavy rain can flood homes, increase the risk of mold, other health risks, and displacement.<br>Heavy Snow: Heavy snow can make mobility difficult for people, especially those with mobility impairments. Heavy snow can also increase the risk of injury and social isolation, especially for elders.<br>High Winds: High winds can occur any time of year. In the winter, high winds associated with winter storms can lead to dangerous wind. High winds can lead to dangerous driving, boating, and general transportation conditions for people, leading to isolation and reduced access to community and healthcare services. Flying debris increases injury risk. Home damage from high winds impacts housing security.<br>**Heavy snowfall has closed workplaces and schools in the past, according to the Planning Team.**<br>**No other previous impacts on people were reported in Sand Point.** |

| | Description of Previous Impacts |
|---|---|
| Utilities | General impacts from severe weather to utilities include:<br>Dense Fog: Dense fog can slow maintenance work and complicate utility inspections.<br>Drought: Drought can strain community water systems and reduce availability of drinking water from lakes, streams, or reservoirs. It can also drive up the cost of water treatment.<br>Extreme Cold: These events, especially when prolonged, can increase energy demand. Extreme cold can freeze lines and increase the need for utility repairs.<br>Heavy Rain: Heavy rain can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, bulk fuel storage, docks, landfills, cemeteries, and homes. Freezing rain can cause damage to powerlines and pipelines. Heavy rain can increase contamination risk if and when floodwaters breach utility infrastructure such as sewage lagoons.<br>Heavy Snow: Heavy snow can cause power disruptions and delay deliveries of utility-related materials such as fuel.<br>High Winds: High winds can knock down trees and powerlines, directly or indirectly damaging utility infrastructure and potentially causing prolonged power outages.<br>**The Planning Team reported water pipes freezing in over 12 homes due to extreme cold in Sand Point.** |
| Transportation | General impacts from severe weather to transportation include:<br>Dense Fog: Dense fog reduces aviation and marine visibility, causing delays and cancellations. Fog can also impact emergency response and medevac operations.<br>Drought: Extreme drought can contribute to low water levels in rivers and bays, potentially limiting navigability. Dust can lead to road degradation.<br>Extreme Cold: Extreme cold can disrupt transportation and complicate emergency response. Specifically, extreme cold can reduce vehicle reliability and lead to aircraft delays.<br>Heavy Rain: Heavy rain can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, and docks. Roads and runways can wash out or otherwise become impassible, limiting travel in and out of villages.<br>Heavy Snow: Heavy snow can block roads and runways, impede emergency response and delay freight and transportation. When combined with high wind conditions, blinding blizzards that impede transportation may occur.<br>High Winds: High winds can create dangerous marine conditions, disrupting freight and travel. Airplanes and medevac flights will not fly above certain wind speed thresholds. High winds increase turbulence hazards.<br>**The Planning Team did not report any specific previous transportation impacts from severe weather events in Sand Point.** |
| Economy | General economic impacts from severe weather include:<br>Dense Fog: Dense fog can disrupt fishing and transport-dependent economic activities.<br>Drought: Low water availability can stress fisheries and increase costs related to water utilities and wildfires.<br>Extreme Cold: Extreme cold can increase heating costs, burdening households and businesses. Other economic activities such as marine activity may decline in periods of extreme cold.<br>Heavy Rain: Heavy rain related damages raise repair costs for homeowners, local governments, and local businesses. |

| | Description of Previous Impacts |
|---|---|
| | Heavy Snow: Heavy snow events increase costs related to snow removal. Heavy snow events can delay freight and transportation.<br>High Winds: High wind events can interrupt fishing and shipping activities. Wind-related damage can be expensive to repair.<br>**The Planning Team did not report any specific previous economic impacts from severe weather events in Sand Point.** |
| Subsistence Resources | General impacts from severe weather to subsistence resources include:<br>Dense Fog: Fog can reduce visibility during subsistence activities, such as marine or travel to subsistence sites.<br>Drought: Drought conditions can impact subsistence resources, ecosystem functions, and increase wildfire risk.<br>Extreme Cold: Extreme cold can impact winter hunting and subsistence activities. It can change the timing of subsistence harvest activities.<br>Heavy Rain: Heavy rains can impact the availability and timing of subsistence species. Flooding can impede access to subsistence areas.<br>Heavy Snow: Heavy snow can impact wildlife movement, slow human travel, and impact subsistence species such as berries.<br>High Winds: High winds can impact transportation associated with subsistence activities. High winds and other severe weather events can damage subsistence equipment, such as boats and drying racks.<br>**The Planning Team did not report any specific previous subsistence impacts from severe weather events in Sand Point.** |

#### K.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Highly Likely** that Sand Point will experience a severe weather event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

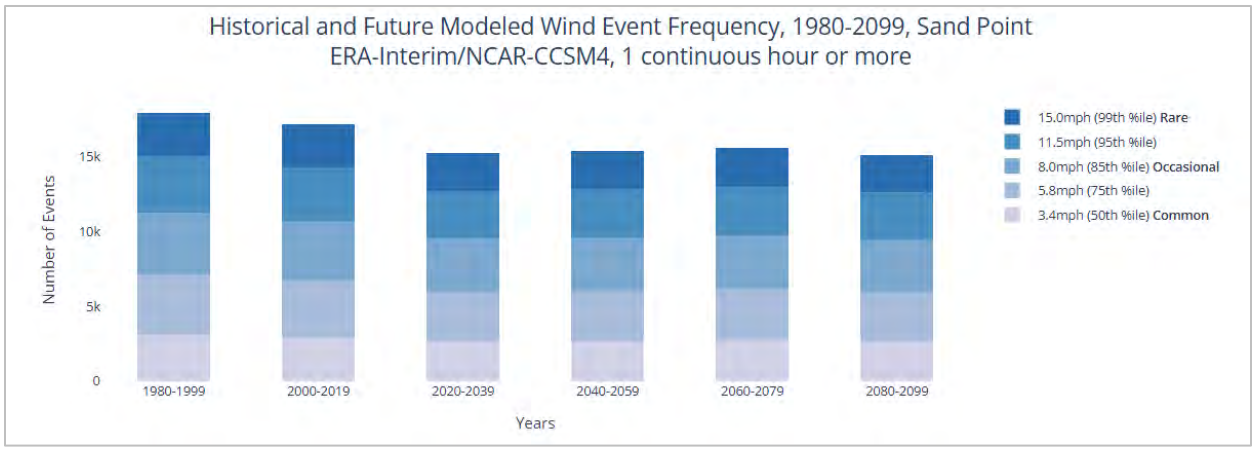
### K.4.1.9.6 Future Climate Conditions

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in Sand Point. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in Sand Point. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in Sand Point. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in Sand Point. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in Sand Point. | It is unlikely that future climate conditions will influence the nature of future high wind events in Sand Point. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in Sand Point. | It is possible that future climate conditions will influence the location of future drought/water supply events in Sand Point. | It is unlikely that future climate conditions will influence the location of future extreme cold events in Sand Point. | It is unlikely that future climate conditions will influence the location of future heavy rain events in the Planning Area. | It is unlikely that future climate conditions will influence the location of future heavy snow events in Sand Point. | It is unlikely that future climate conditions will influence the location of future high wind events in Sand Point. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in the Planning Area could increase (UAF/SNAP 2025). Specifically in Sand Point, monthly average precipitation is projected to increase (UAF/SNAP 2026). | In the Aleutians East Borough, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026). Winter temperatures are increasing the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). Climate change within Alaska is likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). **Specifically in Sand Point, monthly average temperatures are projected to increase (UAF/SNAP 2026).** | In the Aleutians East Borough, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026). Winter temperatures are increasing the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). **Specifically in Sand Point, monthly average temperatures are projected to increase (UAF/SNAP 2026).** | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in the Planning Area. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP). Extreme precipitation events have occurred throughout Alaska with increasing frequency. In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). **Specifically in Sand Point, average monthly precipitation is projected to increase (UAF/SNAP 2026).** | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>The Planning Area experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months.<br>Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). **However, specifically in Sand Point, while high wind speeds have increased in frequency since the 1980s, they are projected to remain relatively stable through the end of the century (UAF/SNAP 2026).** |
| Impact | Projected increases in precipitation and associated moisture availability in the Aleutians East Borough could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026). Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in Sand Point are expected to increase by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible (Alaska DHS&EM 2023). | While overall temperature trends in Sand Point are projected to increase, extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In the Planning Area, models have higher uncertainty regarding precipitation, with the highest increases occurring during the winter months (UAF/SNAP 2026). | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir levels.<br>The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less | While high wind events are projected to increase in Alaska (NOAA 2025), modeling in Sand Point projects relatively stable wind speed distributions to today's (UAF/SNAP 2026). This likely means that impacts from high wind events will not dramatically change in the future. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in the Sand Point by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in Sand Point are projected to increase, (UAF/SNAP 2026). In the AEB generally, annual precipitation has increased by 2% over the past 50 years and it is expected to increase in Sand Point (ACCAP 2026, UAF/SNAP 2026).<br>In the Planning Area, models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (UAF/SNAP 2026). Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in Sand Point are projected to increase, (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In the Planning Area, winter is likely to have more precipitation (UAF/SNAP 2026). Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in the Planning Area may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in the Planning Area have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. These are likely to continue based on climate projections. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in the Sand Point Planning Area. | Future conditions of drought are not anticipated to significantly affect population patterns in the Sand Point Planning Area. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in the Aleutians East Borough Planning Area. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | In the Planning Area, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026). | It is not likely that future conditions influencing heavy snow will impact changes in the Planning Area population patterns. | High-wind events are projected to become more frequent in the future (NOAA 2025). The highest increases are projected to be in the northern and western Alaska coastal regions (AK HMP 2023). However, specific local modeling projects relatively stable wind speed frequencies over the course of the century (UAF/SNAP 2026). Population patterns due to changes in high winds are unlikely as a result. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in the Aleutians East Borough Planning Area. | Future conditions of drought are not anticipated to substantially affect future land use development in the Aleutians East Borough Planning Area. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in the Aleutians East Borough Planning Area, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in the Planning Area population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in the Planning Area land use development. | It is not likely that future conditions of high winds will impact changes in the Planning Area population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in Sand Point. | Future conditions of drought may affect subsistence resources in the Aleutians East Borough Planning Area, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing | Future conditions of extreme cold may affect subsistence resources in the Aleutians East Borough Planning Area, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity. Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC | It is possible that future conditions of heavy rain will impact changes in the Planning Area land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above the Planning Area, leading to an increase in frequency and magnitude and severity of landslides. This could alter where | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, thermal | It is not likely that future conditions of high winds will impact changes in the Planning Area land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users.<br>Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | new developments would be deemed safe and/or possible. Land use may also change due to development of landslide monitoring equipment and/or landslide barriers/diversion structures. | stress, and nutrient availability for subsistence species. | |

Figure K-10 models historical and future wind event frequency in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts a slight decrease in the overall frequency of high wind events in Sand Point by the end of the century, with a relatively stable frequency of wind speeds in general.




Source: UAF/SNAP 2026- Community Wind

**Figure K-10- Historical and Future Modeled Wind Event Frequency in Sand Point (1980-2099)**

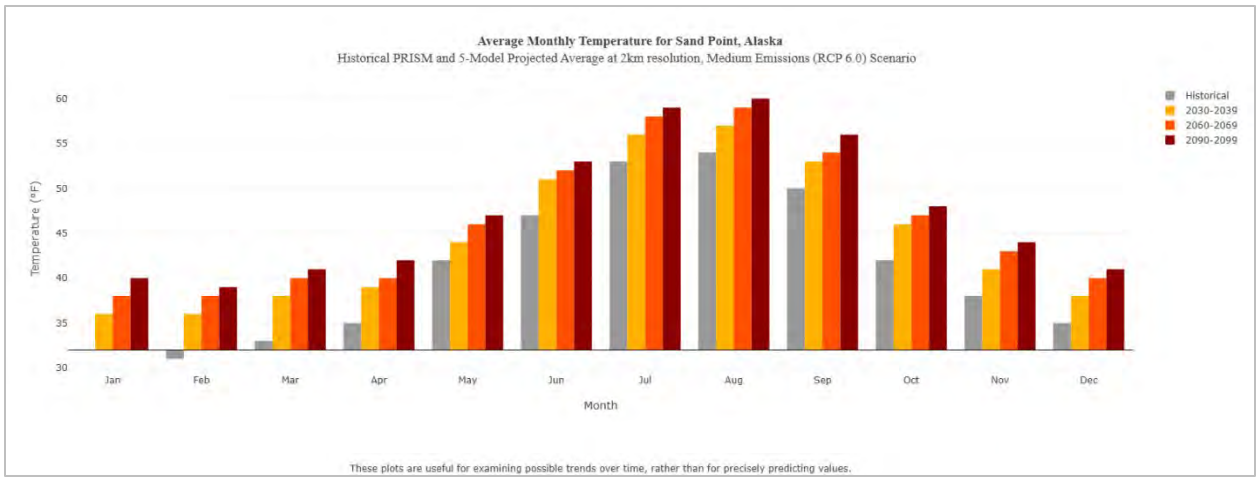
Figure K-11 models historical and future duration of the growing season in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure K-11- Historical and Future Projected Changes in Growing Season in Sand Point (1980-2099)**

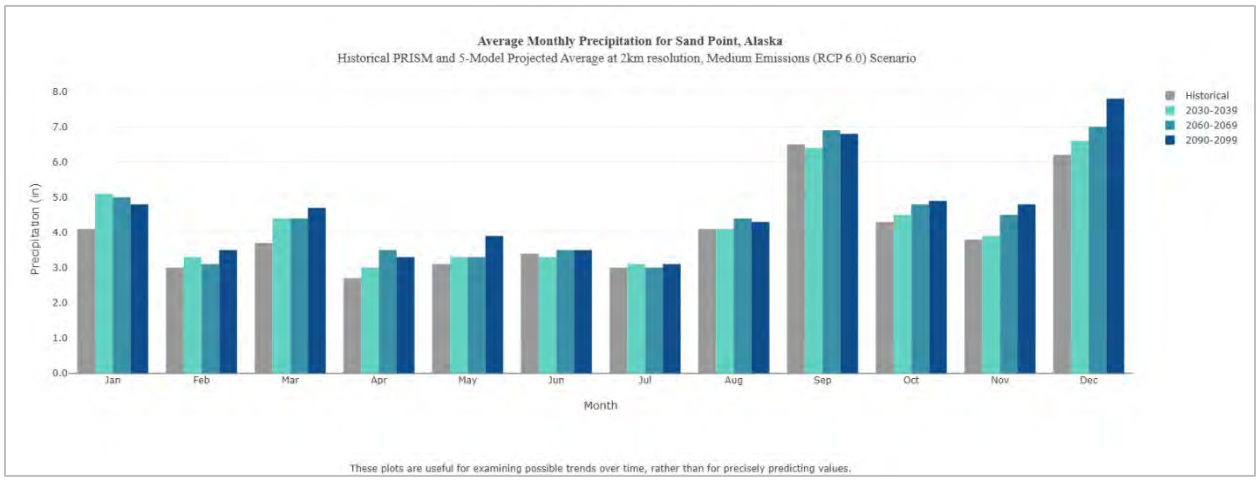
Figure K-12 models historical and future average monthly temperatures in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure K-12- Historical and Future Projected Average Monthly Temperature in Sand Point (1980-2099)**

Figure K-13 models historical and future average monthly precipitation in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure K-13- Historical and Future Projected Average Monthly Precipitation in Sand Point (1980-2099)**

### K.4.1.10 Tsunami

#### K.4.1.10.1 Location

Most critical facilities and infrastructure in Sand Point are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community (Figure K-14).

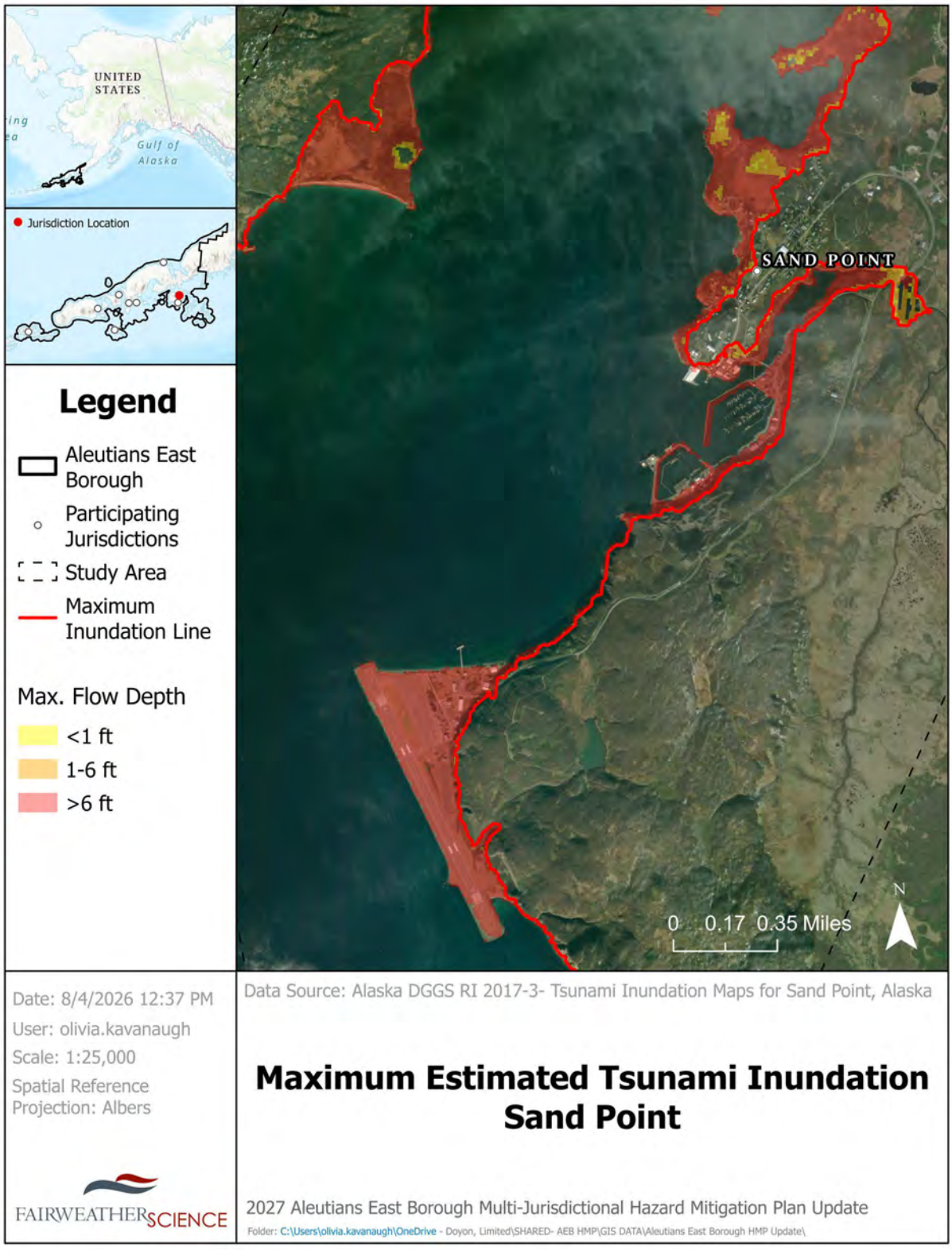



**Figure K-14 - Maximum Estimated Inundation Tsunami Inundation in Sand Point**

### K.4.1.10.2 History

Sand Point is located near historic tsunami event sites, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. See Table 17 in the Base Plan for a comprehensive list from the NOAA National Centers for Environmental Information (NCEI) detailing the earthquake-generated tsunamis with observed or measured waves throughout the Aleutians East Borough.

Since 1788, there have been 28 documented tsunami runup events in Sand Point (Table K-3 and Figure K-15). The most recent runup event in Sand Point was recorded in July 2025.

**Table K-3- Historical Tsunami Runups- Sand Point (1788 - August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 17 | 1946-04-01 | SAND POINT, AK | EQ + LS | 8.6 | Unknown |
| 50 | 1985-03-03 | SAND POINT, AK | EQ | 8 | 0.26 |
| 51 | 1986-05-07 | SAND POINT, AK | EQ | 8 | 0.16 |
| 52 | 1989-09-04 | SAND POINT, AK | EQ | 7.1 | 0.33 |
| 53 | 1995-07-30 | SAND POINT, AK | EQ | 8 | 0.36 |
| 54 | 1996-06-10 | SAND POINT, AK | EQ | 7.9 | 0.16 |
| 55 | 2001-06-23 | SAND POINT, AK | EQ | 8.4 | 0.39 |
| 56 | 2003-11-17 | SAND POINT, AK | EQ | 7.8 | 0.13 |
| 57 | 2004-12-26 | SAND POINT, AK | EQ | 9.1 | 0.46 |
| 59 | 2006-05-03 | SAND POINT, AK | EQ | 8 | 0.16 |
| 60 | 2006-11-15 | SAND POINT, AK | EQ | 8.3 | 0.36 |
| 62 | 2007-08-15 | SAND POINT, AK | EQ | 8 | 0.13 |
| 65 | 2010-02-27 | SAND POINT, AK | EQ | 8.8 | 1.25 |
| 67 | 2011-03-11 | SAND POINT, AK | EQ | 9.1 | 2.00 |
| 71 | 2012-10-28 | SAND POINT, AK | EQ | 7.7 | 0.20 |
| 72 | 2013-02-06 | SAND POINT, AK | EQ | 7.9 | 0.36 |
| 74 | 2014-04-01 | SAND POINT, AK | EQ | 8.2 | 0.30 |
| 76 | 2015-09-16 | SAND POINT, AK | EQ | 8.3 | 0.62 |
| 79 | 2020-07-22 | SAND POINT, AK | EQ | 7.8 | 0.79 |
| 80 | 2020-10-19 | SAND POINT, AK | EQ | 7.6 | 2.30 |
| 82 | 2021-03-04 | SAND POINT, AK | EQ | 8.1 | 0.52 |
| 83 | 2021-07-29 | SAND POINT, AK | EQ | 8.2 | 1.35 |
| 85 | 2021-07-29 | RANGE ISLAND, SAND POINT, AK | EQ | 8.2 | Unknown |
| 87 | 2021-08-12 | SAND POINT, AK | EQ | 8.1 | 0.20 |
| 89 | 2022-01-15 | SAND POINT, AK | VO | N/A | 1.12 |
| 91 | 2023-07-16 | SAND POINT, AK | EQ | 7.2 | 0.49 |

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 92 | 2025-07-16 | SAND POINT, AK | EQ | 7.3 | 0.33 |
| 94 | 2025-07-29 | SAND POINT, AK | EQ | 8.8 | 0.79 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

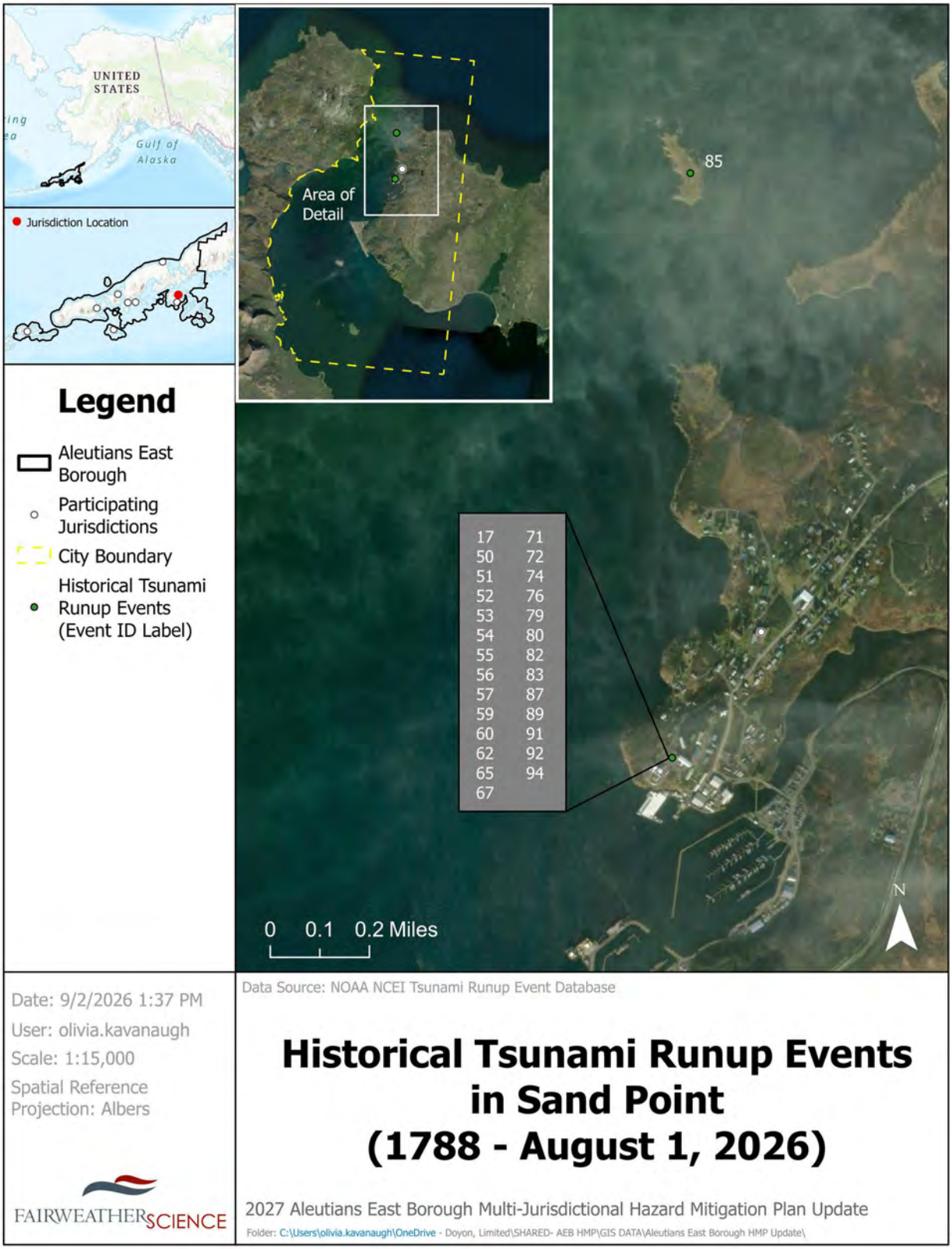



**Figure K-15- Historical Tsunami Runup Events in Sand Point (1788 – August 1, 2026)**

### K.4.1.10.3 Extent (Magnitude and Severity)

Sand Point has experienced tsunami runups ranging in size from less than 1 foot to 2.3 feet.

Based on inundation mapping, maximum depth of tsunami inundation could reach over 6 feet in depth.

Based on the extent of past tsunami events and the criteria identified in Table 5 in the Base Plan, the extent of tsunamis in Sand Point is considered **Critical,** with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

### K.4.1.10.4 Impacts

| | Description of Impacts |
|---|---|
| Geography/Land | There have been documented tsunami runups up to 2.3 feet in Sand Point. Future tsunami runups could potentially match or exceed these heights, having significant impact on the shoreline. |
| Infrastructure | There are no recorded impacts from tsunamis in Sand Point. Water damage in coastal lying infrastructure is possible during a tsunami, as is damage to boat harbors, roadways, and airport runways.<br><br>Critical facilities at risk of tsunami inundation include the Salmon Hatchery, Aquaculture Building, Church, Saint Nicholas Church, Storage Building, Volunteer Fire Department Building, Fire Boat, FAA Building, ARFF / SREB Building, Robert E. Galovin Small Boat Harbor, Harbor House, Sand Point Boat Storage, Trident Seafood Dock, SDP 150 Ton Travel Lift, Sand Point Harbor, Large Boat Dock, Harbor Dock, Cargo Storage Area, Sand Point Ferry Dock, City Dock, Sand Point DOT, Reeve Air Building, Aviation Terminal, Airport Runway, Small Airplane Storage, Water Reservoir, City Pump House, and Humboldt Creek Reservoir Dam. |
| People | There is no record of injuries or fatalities due to tsunamis or in Sand Point. Injuries and death are possible during a tsunami runup due to drowning, being swept into debris, or trapped during inundation. |
| Utilities | There is no record of utility disruptions due to tsunamis in Sand Point. Tsunamis can damage underground water and sewer lines, underwater cables, overhead power lines, and septic systems. |
| Transportation | There are no recorded tsunami related impacts on transportation systems in Sand Point. Future tsunamis could impact road and air travel by damaging or inundation runway surfaces and roadways. Marine travel could also be limited or delayed due to damage to boat harbors, marine vessels, or fueling stations along the coast. |
| Economy | There are no recorded economic impacts due to tsunamis in Sand Point. |
| Subsistence Resources | There are no recorded tsunami related impacts on subsistence resources in Sand Point. |

### K.4.1.10.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Sand Point will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

### K.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in Sand Point is not anticipated to change in the future. |
| Location | The location of tsunami events in Sand Point is not anticipated to change in the future. All low-lying coastal areas in Sand Point will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in Sand Point. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in Sand Point. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate changes. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in Sand Point. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in Sand Point, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in Sand Point could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in Sand Point, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in Sand Point, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area. Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in Sand Point. |

### K.4.1.11 Volcano

#### K.4.1.11.1 Location

The entire geography of Sand Point is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.

According to the 2023 State of Alaska HMP, Sand Point is located in a **moderate** volcanic ash hazard level area (Figure K-16).

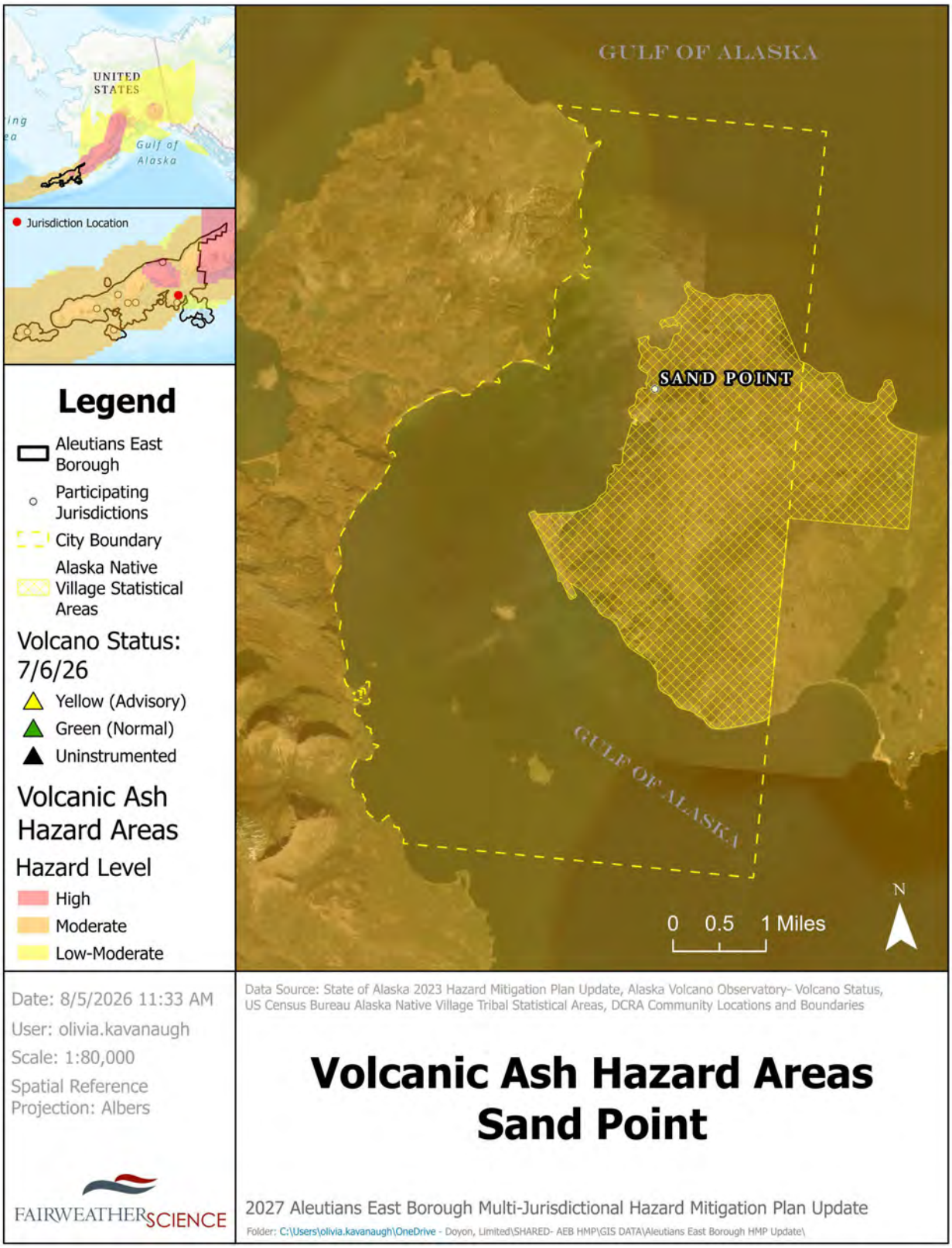



**Figure K-16- Sand Point Volcanic Hazard Area**

### K.4.1.11.2 History

Sand Point has had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to Sand Point is **Mount Pavlof**, which is approximately 55 miles west of the community. Pavlof has erupted a total of 31 times since 1900, with several of them resulting in localized impacts. The eruptions in 1975, 1996, 2007, 2013, and 2014 resulted in light ash fall accumulating in several AEB communities, including Sand Point.

**Mount Shishaldin** is a historically active volcano that has resulted in several eruptions that has impacted the AEB, including Sand Point. Located approximately 143 miles southwest of Sand Point, Shishaldin has erupted a total of 24 times since 1900. In 2023, it was reported that an eruption from Shishaldin resulted in light ash fall accumulating in Sand Point (AVO 2023).

### K.4.1.11.3 Extent (Magnitude and Severity)

Sand Point is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, Sand Point has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community.

Based on the extent of past volcano events and the criteria identified in Table 5 in the Base Plan, the extent of volcanoes in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

### K.4.1.11.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding Sand Point has been ashfall. While most of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposit (USGS 2015). |
| Infrastructure | The historical ashfall reported in Sand Point has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of Sand Point from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community. |
| Utilities | There have been no documented cases of volcanic eruptions causing utility disruptions in Sand Point. While wet ash can cause power outages by coating insulators and transformers, the ashfall in the community from past eruptions have only resulted in trace amounts scattered throughout Sand Point (USGS 2015). |
| Transportation | The primary transportation related impact from a volcanic eruption in Sand Point is aircraft interruptions. Ash clouds from Mount Pavlof's 2013 and 2014 eruptions caused flights from the Sand Point Airport to be cancelled for a total of 1 week (AVO 2014). |
| Economy | The primary economic related impact from a volcanic eruption in Sand Point is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations. |
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in Sand Point that has impacted the community's access to subsistence resources. |

### K.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact Sand Point.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 6 in the Base Plan, it is **Highly Likely** that Sand Point will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### K.4.1.11.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in Sand Point. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in Sand Point. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in Sand Point. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in Sand Point. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in Sand Point. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in Sand Point. |
| Land Use Development | Future climate conditions are not expected to influence land use development in Sand Point. |
| Subsistence Resources | Future climate conditions are not expected to influence Sand Point's ability to access subsistence resources. |

### K.4.1.12 Wildland Fire

The Qagan Tayagungin Tribe of Sand Point Planning Team did not select this hazard for the MJHMP.

According to LANDFIRE's (Landscape Fire and Resource Management Planning Tools Project) 2025 Alaska Statewide Wildfire Exposure Assessment, the majority of the Sand Point Planning Area is located in an area that is **Minimally Exposed to Wildfire Hazard**. The population center of Sand Point is located in an area that is Infrequently Exposed to Wildfire Hazard (Figure K-17).

Figure K-18 depicts historical fire events near Sand Point and Unga Island. All of these fires were due to human negligence, not natural causes.

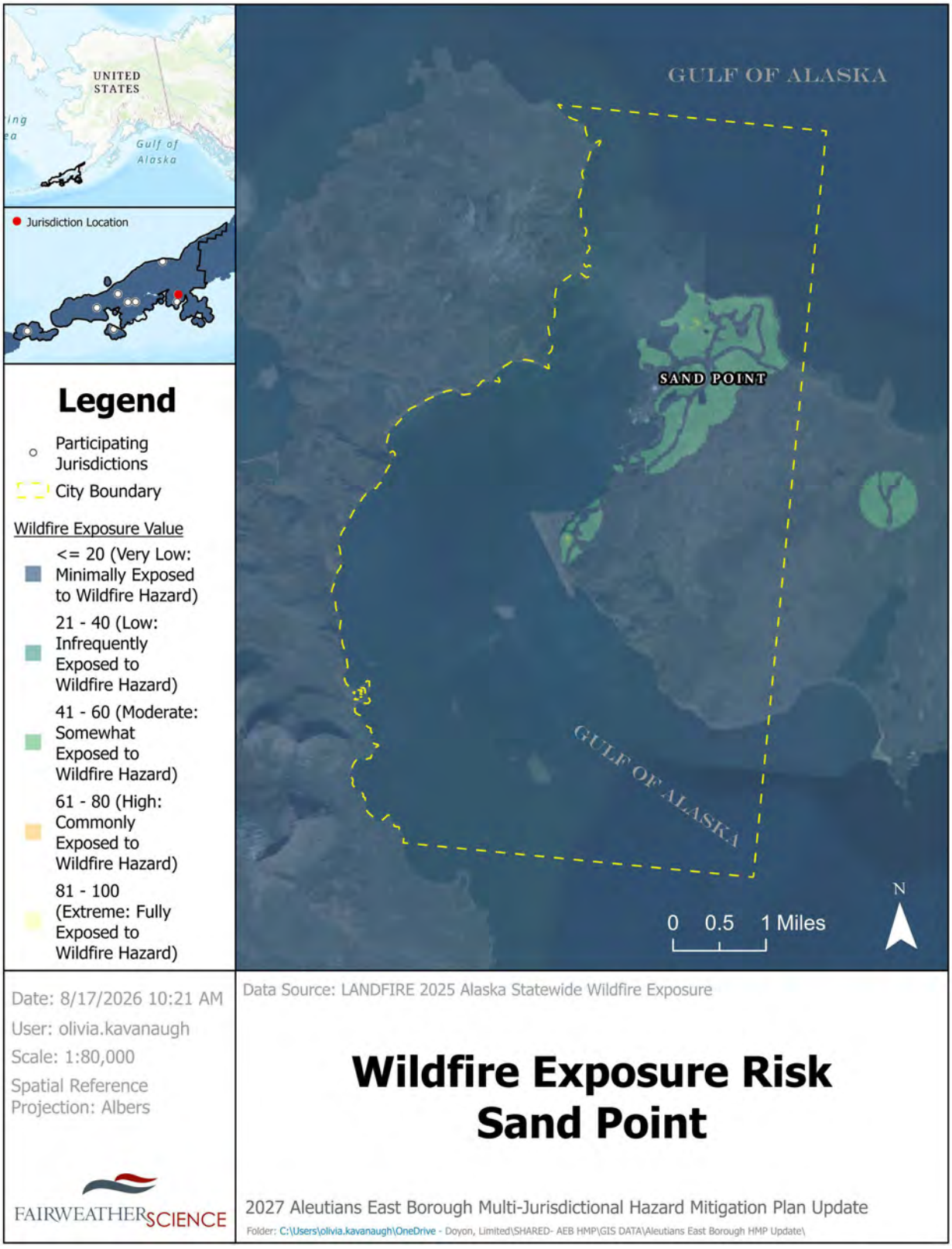



**Figure K-17- Sand Point Wildfire Exposure Risk**

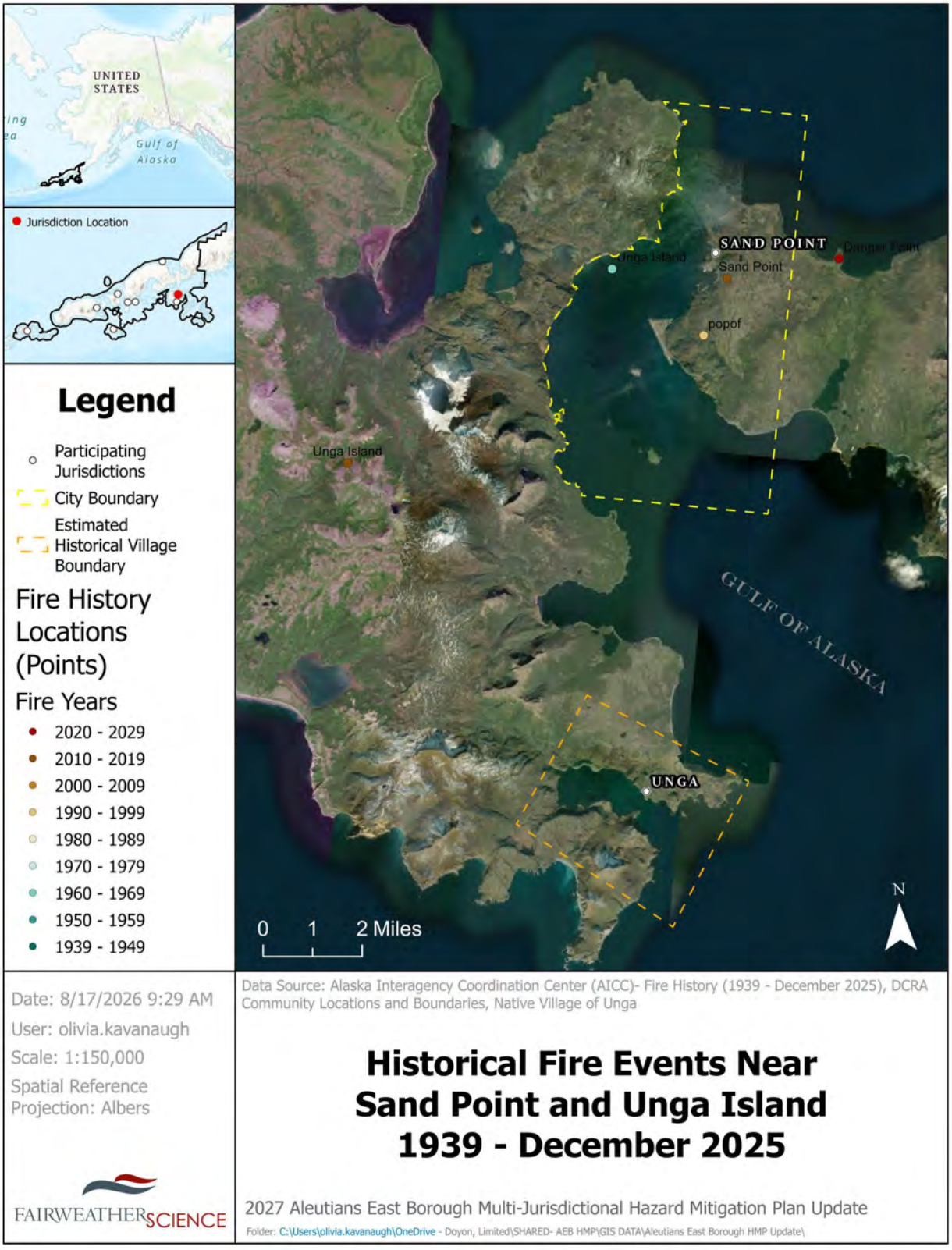



**Figure K-18- Historical Fire Events Near Sand Point and Unga Island**

## K.4.2 Critical Facilities

**Table K-4- Critical Facilities- Qagan Tayagungin Tribe of Sand Point**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Qagan Tayagungin Tribe of Sand Point | Government | 5 | Qagan Tayagungin Tribe- Tribal Office | Church Ln | 55.340732 | -160.498235 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 2 | Qagan Tayagungin Tribe of Sand Point | Government | 10 | Tribal Recreation Center | Red Cove Rd | 55.348363 | -160.484338 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 3 | Qagan Tayagungin Tribe of Sand Point | Commercial | 0 | Salmon Hatchery | Airport Rd | 55.341478 | -160.485901 | $1,000,000 | | | | | | x | | x | | x | x | x | | x | |
| 4 | Qagan Tayagungin Tribe of Sand Point | Commercial | 0 | Aquaculture Building | 3524 Aiport Rd | 55.341394 | -160.486714 | $1,000,000 | | | | | | x | | x | | x | x | x | | x | |
| 5 | Qagan Tayagungin Tribe of Sand Point | Commercial | 40 | Alaska Commercial Company - Grocery Store | 100 Main St | 55.342159 | -160.496118 | $5,000,000 | | Shumagin Native Corporation | | | | x | | x | | x | | x | | | |
| 6 | Qagan Tayagungin Tribe of Sand Point | Commercial | 0 | Humboldt Quarry | Airport Rd | 55.327829 | -160.501685 | $20,000,000 | | | | | | x | | x | | x | | x | | | |
| 7 | Qagan Tayagungin Tribe of Sand Point | Community | 0 | Swimming Pool | 269 Red Cove Rd | 55.351964 | -160.475965 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 8 | Qagan Tayagungin Tribe of Sand Point | Community | 0 | Baseball Field | Red Cove Rd | 55.350567 | -160.475336 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 9 | Qagan Tayagungin Tribe of Sand Point | Community | 0 | Unites States Postal Service | 9998 Main St | 55.346554 | -160.487202 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 10 | Qagan Tayagungin Tribe of Sand Point | Community | 0 | Cemetery | Pavlof Ave | 55.342559 | -160.496948 | $1,000,000 | | | | | | x | | x | | x | | x | | | |
| 11 | Qagan Tayagungin Tribe of Sand Point | Community | 0 | E.A.T / Teen Center | 1314 Sand point Ave | 55.339947 | -160.497604 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 12 | Qagan Tayagungin Tribe of Sand Point | Community | 20 | Church | Baptist Church | 55.340778 | -160.499087 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 13 | Qagan Tayagungin Tribe of Sand Point | Community | 20 | Saint Nicholas Church | Sand Point Ave | 55.336742 | -160.497364 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 14 | Qagan Tayagungin Tribe of Sand Point | Community | 0 | Trident Cemetery | Tolsytoi Ave | 55.336586 | -160.500552 | $1,000,000 | | | | | | x | | x | | x | | x | | | |
| 15 | Qagan Tayagungin Tribe of Sand Point | Community | 0 | Storage Building | Boat Harbor Rd | 55.334232 | -160.495101 | $50,000 | | | | | | x | | x | | x | x | x | | | |
| 16 | Qagan Tayagungin Tribe of Sand Point | Education | 1000 | Sand Point School | 269 Red Cove Rd | 55.35171 | -160.475684 | $38,379,381 | | | | | | x | | x | | x | | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Qagan Tayagungin Tribe of Sand Point | Education | 50 | Library | 269 Red Cove Rd | 55.351539 | -160.475433 | $5,000,000 | | | | | | x | | x | | x | | x | | | |
| 18 | Qagan Tayagungin Tribe of Sand Point | Emergency Response | 10 | Volunteer Fire Department | 100 Sand Point Rd | 55.340735 | -160.489419 | $1,000,000 | | | | | | x | | x | | x | x | x | | x | |
| 19 | Qagan Tayagungin Tribe of Sand Point | Emergency Response | 0 | Fire Boat | Small Boat Harbor | 55.334289 | -160.49923 | $50,000 | | | | | | x | | x | | x | x | x | | | |
| 20 | Qagan Tayagungin Tribe of Sand Point | Government | 0 | KSDP Radio Station | 5500 Red Cove Rd | 55.349578 | -160.472725 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 21 | Qagan Tayagungin Tribe of Sand Point | Government | 0 | Aleutians East Borough Garage | 4056 Humbolt Ln | 55.344665 | -160.481921 | $50,000 | | | | | | x | | x | | x | | x | | | |
| 22 | Qagan Tayagungin Tribe of Sand Point | Government | 0 | Aleutians East Borough Office | 349 Humbolt Ln | 55.344317 | -160.481758 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 23 | Qagan Tayagungin Tribe of Sand Point | Government | 0 | ADF&G Shed | 3000 B Sand Point Ave | 55.345612 | -160.488508 | $50,000 | | | | | | x | | x | | x | | x | | | |
| 24 | Qagan Tayagungin Tribe of Sand Point | Government | 0 | TelAlaska Tower | 100 Sand Point Ave | 55.342566 | -160.494149 | $1,000,000 | | | | | | x | | x | | x | | x | | | |
| 25 | Qagan Tayagungin Tribe of Sand Point | Government | 10 | City Hall | 423 Main St | 55.340985 | -160.498091 | $1,000,000 | | | | | | x | | x | | x | | x | | | |
| 26 | Qagan Tayagungin Tribe of Sand Point | Government | 0 | Sand Point City Public Works | 1000 Airport Rd | 55.335356 | -160.490407 | $1,000,000 | | | | | | x | | x | | x | | x | | | |
| 27 | Qagan Tayagungin Tribe of Sand Point | Government | 0 | USGS Shumagin Magnetic Observatory | 1000 Airport Rd | 55.335274 | -160.491416 | $5,000,000 | | | | | | x | | x | | x | | x | | | |
| 28 | Qagan Tayagungin Tribe of Sand Point | Government | 0 | FAA Building | Airport Rd | 55.317117 | -160.519873 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 29 | Qagan Tayagungin Tribe of Sand Point | Government | 0 | ARFF / SREB Building | Airport Rd | 55.316828 | -160.520543 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 30 | Qagan Tayagungin Tribe of Sand Point | Government | 0 | FAA Satelitte Communication Dish | Airport Rd | 55.317117 | -160.519873 | $5,000,000 | | | | | | x | | x | | x | x | x | | | |
| 31 | Qagan Tayagungin Tribe of Sand Point | Medical | 20 | Sand Point Community Health Center | 172 Red Cove Rd | 55.347559 | -160.485798 | $5,000,000 | | | | | | x | | x | | x | | x | | | |
| 32 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Robert E. Galovin Small Boat Harbor | | 55.33192077 | -160.500739 | $60,000,000 | | | | | | x | | x | | x | x | x | | | |
| 33 | Qagan Tayagungin Tribe of Sand Point | Transportation | 5 | Harbor House | | 55.33517231 | -160.496317 | $50,000 | | | | | | x | | x | | x | x | x | | | |
| 34 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Sand Point Boat Storage | Boat Harbor Rd | 55.336818 | -160.495245 | $500,000 | | | | | | x | | x | | x | x | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Trident Seafood Dock | Chichagof Ave | 55.335219 | -160.50114 | $20,000,000 | | | | | | x | | x | | x | x | x | | | |
| 36 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | SDP 150 Ton Travel Lift | Boat Harbor Rd | 55.33481 | -160.496252 | $5,000,000 | | | | | | x | | x | | x | x | x | | | |
| 37 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Sand Point New Harbor | Boat Harbor Rd | 55.331477 | -160.501896 | $60,000,000 | | | | | | x | | x | | x | x | x | | | |
| 38 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Big Boat Dock | Boat Harbor Rd | 55.330773 | -160.501556 | $20,000,000 | | | | | | x | | x | | x | x | x | | | |
| 39 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Harbor Dock | Boat Harbor Rd | 55.330069 | -160.502449 | $20,000,000 | | | | | | x | | x | | x | x | x | | | |
| 40 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Cargo Storage Area | Boat Harbor Rd | 55.330339 | -160.500958 | $50,000 | | | | | | x | | x | | x | x | x | | | |
| 41 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Humboldt Harbor Dock | Boat Harbor Rd | 55.328277 | -160.508622 | $20,000,000 | | | | | | x | | x | | x | | x | | | |
| 42 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Sand Point Ferry Dock | Boat Harbor Rd | 55.331166 | -160.505205 | $20,000,000 | | | | | | x | | x | | x | x | x | | | |
| 43 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | City Dock | Boat Harbor Rd | 55.331877 | -160.503971 | $20,000,000 | | | | | | x | | x | | x | x | x | | | |
| 44 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Sand Point DOT | 268 Airport Rd | 55.318571 | -160.520728 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 45 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Reeve Air Building | Airport Rd | 55.317597 | -160.519826 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 46 | Qagan Tayagungin Tribe of Sand Point | Transportation | 20 | Aviation Terminal | Airport Rd | 55.317621 | -160.521373 | $1,000,000 | | | | | | x | | x | | x | x | x | | | |
| 47 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Airport Runway | Airport Rd | 55.318719 | -160.526886 | $50,000,000 | 5,213 x 150 ft pavement path | | | | | x | | x | | x | x | x | | | |
| 48 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | Small airplane storage SDP | Airport Rd | 55.316449 | -160.520386 | $5,000,000 | | | | | | x | | x | | x | x | x | | | |
| 49 | Qagan Tayagungin Tribe of Sand Point | Transportation | 0 | SDP Heavy Duty Pier | Small Boat Harbor | 55.332938 | -160.49782 | $20,000,000 | | | | | | x | | x | | x | x | x | | | |
| 50 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | Landfill | Landfill Access Rd | 55.331253 | -160.429187 | $1,000,000 | | | | | | x | | | | x | | x | | | |
| 51 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | Water Pump Station 1 | Nagai Ave | 55.349139 | -160.467973 | $1,000,000 | | | | | | x | | x | | x | | x | | | |
| 52 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | Water Pump Station 2 | Nagai Ave | 55.350709 | -160.471488 | $1,000,000 | | | | | | x | | x | | x | | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | City Water Tank | Red Cove Rd | 55.352531 | -160.475049 | $5,000,000 | | | | | | x | | x | | x | | x | | | |
| 54 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | Sewage Treatment Plant | Kelly Ave | 55.355667 | -160.486484 | $5,000,000 | | | | | | x | | x | | x | | x | | | |
| 55 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | Water Reservoir | Airport Rd | 55.340452 | -160.483747 | $5,000,000 | | | | | | x | | x | | x | x | x | | | |
| 56 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | City Pump House | Airport Rd | 55.341579 | -160.48573 | $500,000 | | | | | | x | | x | | x | x | x | | x | |
| 57 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | TDX Wind Farm | 3004 Sand Point Ave | 55.343635 | -160.489 | $20,000,000 | | | | | | x | | x | | x | | x | | | |
| 58 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | Water Tank 1 | 3010 Sand Point Ave | 55.343239 | -160.490003 | $5,000,000 | | | | | | x | | x | | x | | x | | | |
| 59 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | Water Tank 2 | 3016 Sand Point Ave | 55.342519 | -160.490712 | $5,000,000 | | | | | | x | | x | | x | | x | | x | |
| 60 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | GCI Satellite Station | Sand Point ave | 55.342622 | -160.484268 | $20,000,000 | | | | | | x | | x | | x | | x | | | |
| 61 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | Humboldt Creek Reservoir Dam | | 55.34129 | -160.48566 | $20,000,000 | Dam | City of Sand Point | | | | x | | x | | x | x | x | | x | |
| 62 | Qagan Tayagungin Tribe of Sand Point | Utilities | 0 | New England Fish Co Dam | | 55.31598 | -160.50875 | $20,000,000 | Dam | Shumagin Native Corporation | | | | x | | x | | x | | x | | x | |
| **Total Occupants:** | | | **1210** | | | **Total Estimated Value:** | | **$528,679,381** | | | | | | | | | | | | | | | |

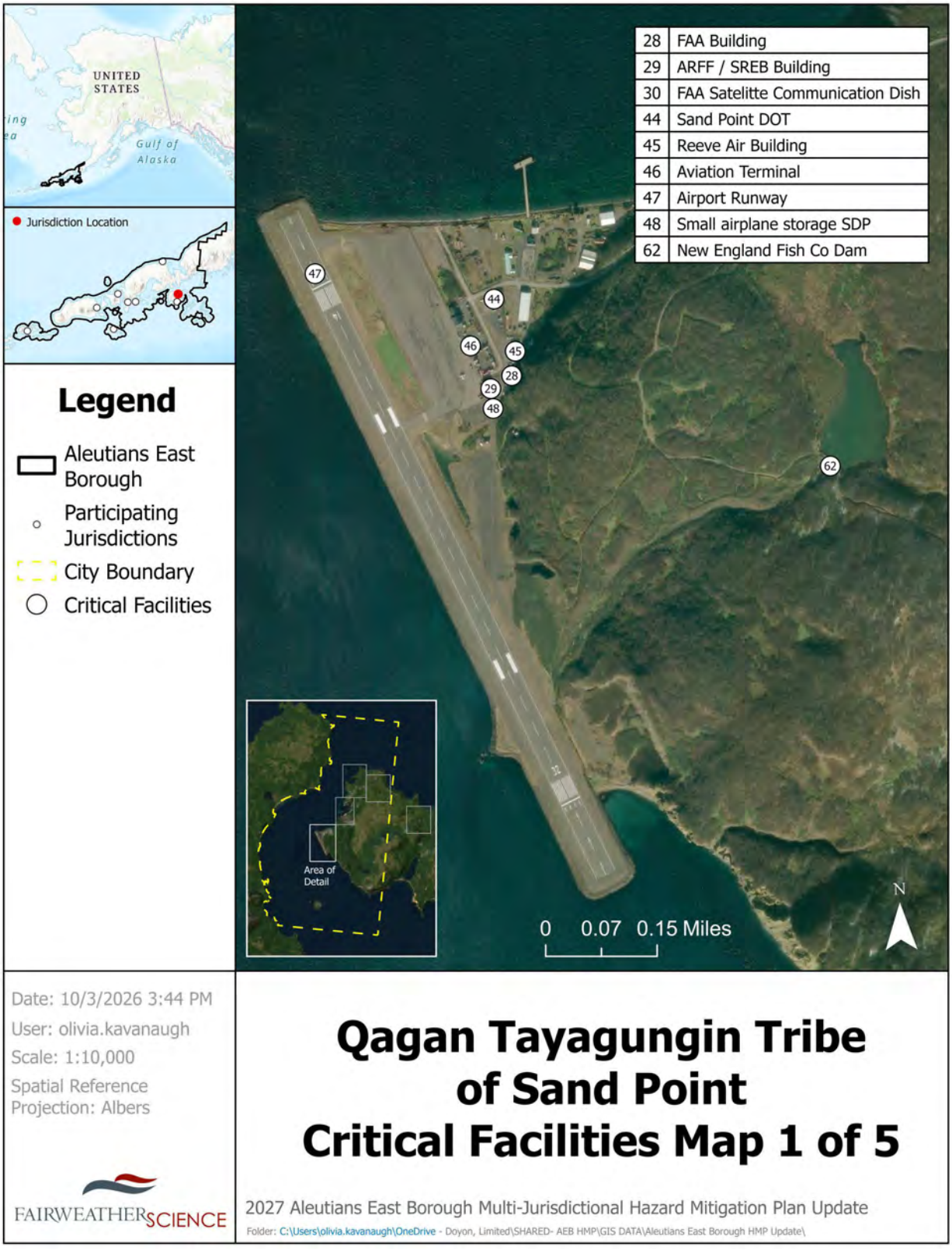



**Figure K-19- Qagan Tayagungin Tribe of Sand Point Critical Facilities Map 1 of 5**

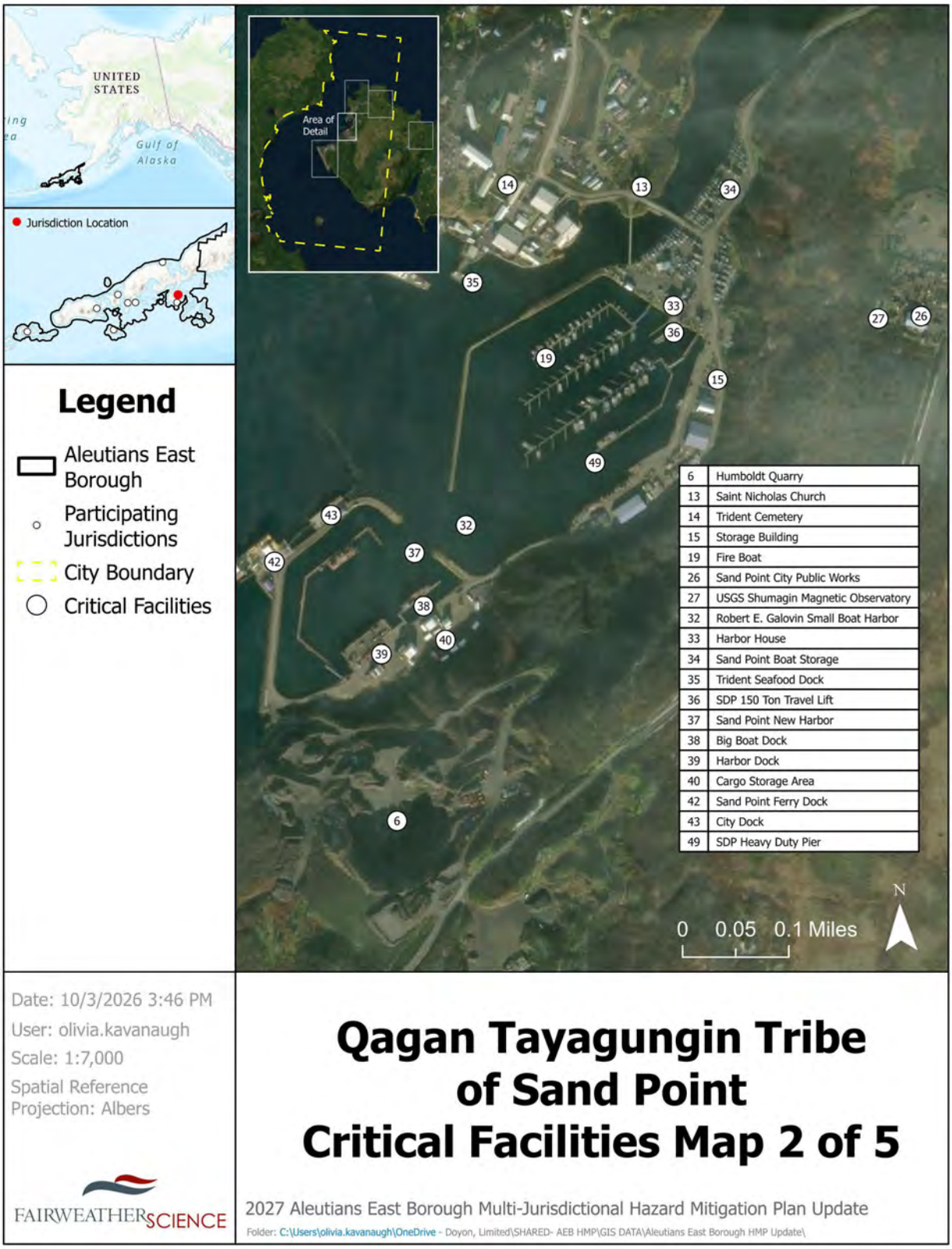



**Figure K-20- Qagan Tayagungin Tribe of Sand Point Critical Facilities Map 2 of 5**

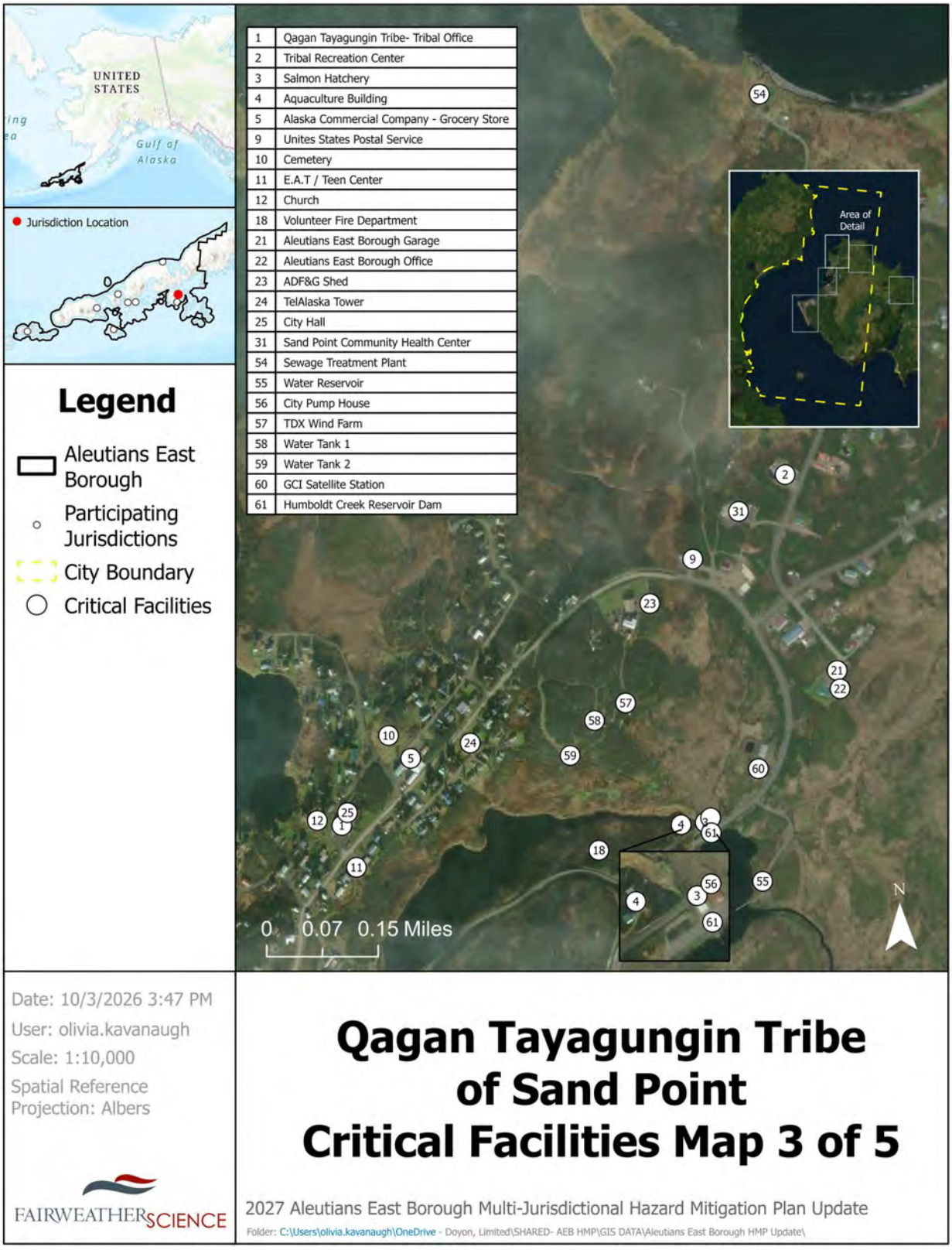



**Figure K-21- Qagan Tayagungin Tribe of Sand Point Critical Facilities Map 3 of 5**

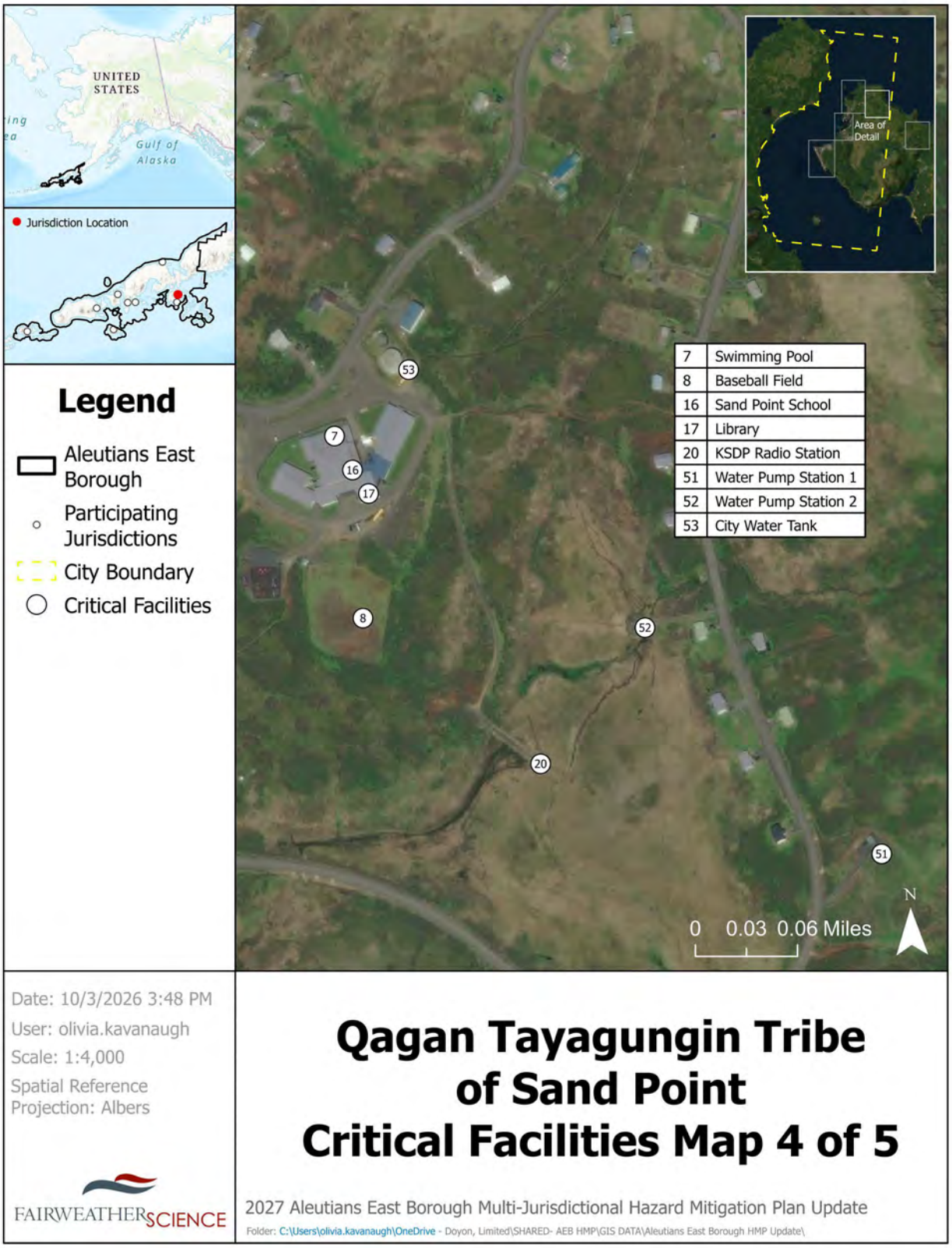



**Figure K-22- Qagan Tayagungin Tribe of Sand Point Critical Facilities Map 4 of 5**

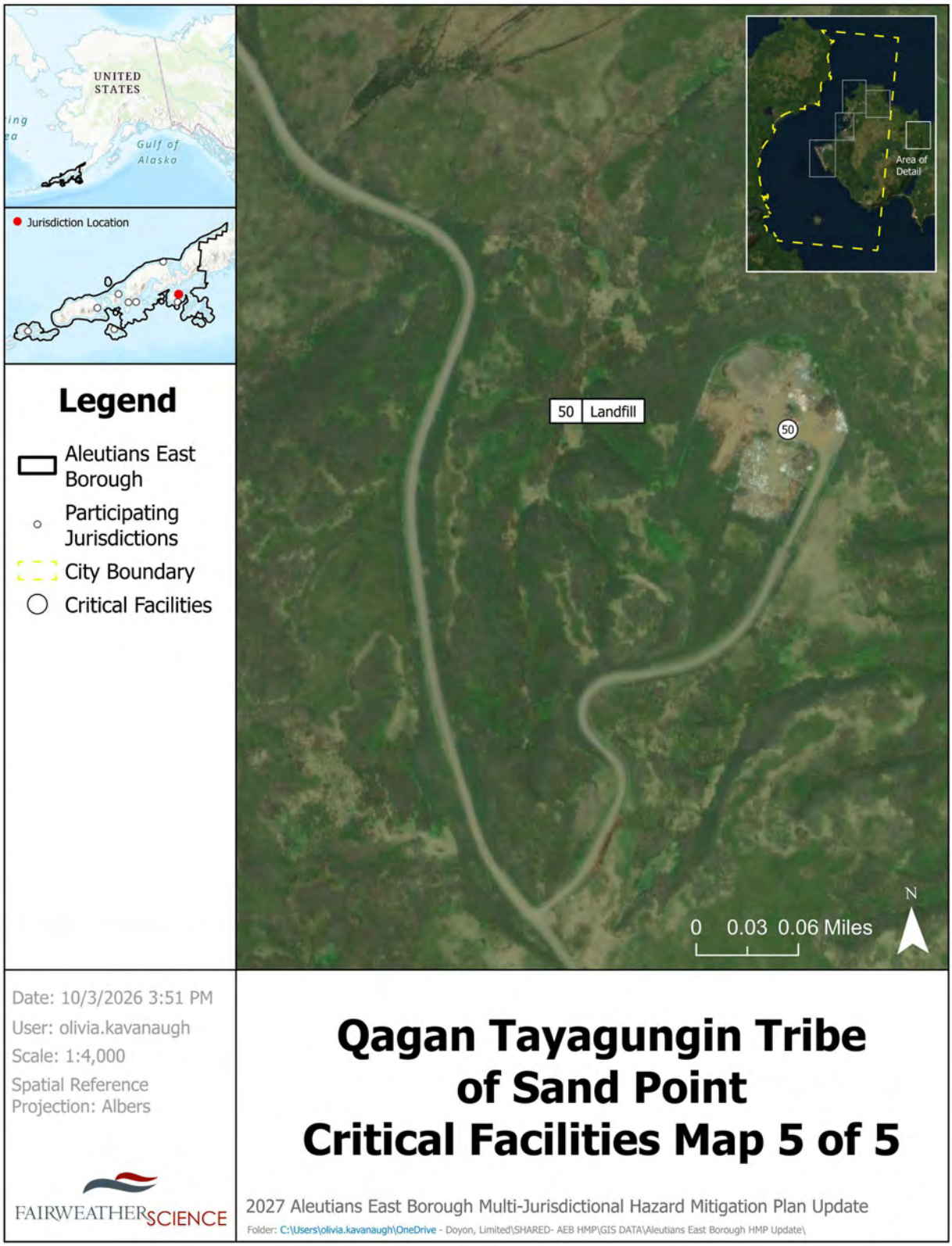



**Figure K-23- Qagan Tayagungin Tribe of Sand Point Critical Facilities Map 5 of 5**

## K.4.3 Summary of Vulnerability

**Table K-5- Jurisdictional Summary of Vulnerability- Qagan Tayagungin Tribe of Sand Point**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere-Snow Avalanche | Did not profile this hazard | | | | | |
| Earthquake | 62 | 1210 | $528,679,381 | 237 | 948 | $170,395,480 |
| Sediment Deterioration and Land Destabilization | Did not profile this hazard | | | | | |
| Flood | 61 | 1210 | $527,679,381 | 236 | 944 | $169,670,592 |
| Ground Failure/ Landslide | Did not profile this hazard | | | | | |
| Severe Weather | 62 | 1210 | $528,679,381 | 237 | 948 | $170,395,480 |
| Tsunami | 30 | 75 | $338,200,000 | 50 | 200 | $35,831,760 |
| Volcano | 62 | 1210 | $528,679,381 | 237 | 948 | $170,395,480 |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | 7 | 10 | $48,500,000 | 1 | 4 | $724,888 |
| Invasive Species | 0 | 0 | $0 | 0 | 0 | $0 |

The Qagan Tayagungin Tribe's vulnerability to natural hazards extends beyond potential damage to buildings and infrastructure. Tribal citizens maintain cultural and subsistence relationships with the lands, waters, fish, wildlife, and other resources of Sand Point and the Tribe's broader ancestral homeland. Hazards that restrict access to subsistence resources, disrupt marine or air transportation, damage infrastructure supporting harvesting and fishing activities, or affect the availability of locally harvested resources may therefore create impacts not fully represented in the quantitative exposure estimates above.

## K.5 Capability Assessment

***Note: the Qagan Tayagungin Tribe of Sand Point does not participate in the National Flood Insurance Program (NFIP).***

| Planning and Regulatory Tools | |
|---|---|
| **Plans** | **Existing?** |
| Comprehensive/ Master Plan | No |
| Capital Improvements Plan | No |
| Economic Development Plan | Yes- Local Economic Development Plan |
| Emergency Operations Plan or Small Community Emergency Operations Plan | Yes- with City |
| Transportation Plan | Yes- Tribal Long Range Transportation Plan |
| Housing Plan | Yes- Housing Improvement with APIA |
| Hazard-specific plans or studies | Yes- EPA Tribal Environmental Plan, Ambient Air Quality Study, Algal Bloom Study |
| **Land Use Planning and Ordinances or Practices** | |
| **Ordinance/Practice** | **Existing?** |
| Zoning Ordinance | City- Yes, Tribe- No |
| Subdivision Ordinance | City- Yes, Tribe- No |
| Building Codes | No- Buildings are inspected, comply with minimum building codes as applicable to tribal infrastructure |
| Natural Hazard Specific Ordinance or Practices (Stormwater, Steep Slopes, Wildfire) | No |
| Acquisition of Land for Open Space and Public Recreation Uses | No |
| Maintenance Programs to Reduce Risk, E.G., Tree Trimming, Clearing Drainage Systems | No |
| Other | |
| **Administrative and Technical** | |
| **Resource** | **Existing?** |
| Tribal Council/ Governing Body | Yes- Made up of 7 people, 5 staff members. Anything tribe does goes through council. |
| Tribal Chief Executive | No- Everything goes through Tribal President |
| Mitigation Planning Committee | Yes |
| Business Committees | No |
| Mutual Aid Agreements | No. |
| Code Inspector | No |

| Administrative and Technical | |
|---|---|
| **Resource** | **Existing?** |
| Environmental/Natural Resources Specialist | Yes |
| Emergency Manager | No |
| Community Planner | No |
| Housing Specialist | No |
| Engineer | No |
| Historian/ Cultural Advisor | No |
| Financial or Grants Specialist | Yes- Finance Director |
| Administrative Staff Person | Yes |
| Other- IGAP Coordinator | No |
| Warning Systems/ Services | No |
| Hazard Data/Information | No |
| Grant Writing | Yes- Environmental Department |
| Geographic Information Systems (GIS) Analysis | Yes- Environmental Department |

| Financial | |
|---|---|
| **Resource** | **Existing?** |
| Capital Improvements Project Funding | Not sure |
| Gaming Revenue, Enterprise Revenues | Not sure |
| Fees For Water, Sewer, Gas, or Electric Services | Not sure |
| Fees From Festivals, Campsites, and recreational Areas | Not sure |
| Permits and Other Fees | Not sure |
| Federal Funding (BIA, HUD) | Not sure |
| Contract Services | Not sure |

| Education and Outreach | |
|---|---|
| **Program/Organization** | **Existing?** |
| Gatherings, Festivals, Celebrations and/or Meetings | Yes- tribal use program, Culture Camp |
| Natural Disaster or Safety- Related School Programs | Yes- School conducts earthquake, tsunami and fire safety drill/education |
| Fire Safety Programs | Yes- School conducts fire safety drills/education |

The Tribe has identified existing infrastructure that reduces local hazard impacts. The Planning Team reported that snowmelt and rainfall runoff generally do not result in significant flooding and attribute this in part to effective drainage systems. Maintaining drainage features and the practices that support their effectiveness represents an existing local flood-mitigation capability.

# K.6 Mitigation Strategy

## K.6.1 Mitigation Goals

The Qagan Tayagungin Tribe of Sand Point has identified its goals related to hazard mitigation as:

1. Protect life, health, and critical facilities from natural hazards.
2. Maintain reliable access to power, water, communications, transportation, healthcare, and emergency services during and after hazard events.
3. Reduce damage to Tribal facilities, homes, roads, bridges, docks, harbor infrastructure, fuel systems, and subsistence access points.
4. Incorporate local and Indigenous knowledge into hazard identification, land-use decisions, public education, and project prioritization.
5. Strengthen coordination among the Tribe, City, Borough, school, clinic, utilities, businesses, and state and federal partners.
6. Pursue feasible mitigation funding and complete priority projects within the five-year plan period.

## K.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

This is the first edition HMP for the Qagan Tayagungin Tribe of Sand Point.

As such, there is no previous HMP and no previously identified mitigation actions for the jurisdiction to provide a status update.

Future plan updates will document the status and progress of mitigation actions identified in this HMP.

## K.6.3 2027 Mitigation Action Plan

**Table K-6- 2027 Mitigation Action Plan- Qagan Tayagungin Tribe of Sand Point**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | All Hazard | Install backup generators to support critical facilities | H | Environmental Department | FEMA HMA; FEMA HMGP; USDA RD; Denali Commission; ANTHC | Structure and Infrastructure Projects | All | 5-10 years | B/C: Backup generators would provide emergency power to critical facilities and help maintain essential services during extended power outages. TF: This project is technically feasible using commercially available generators and appropriate electrical connections, with routine maintenance required. | Existing Plans: Local Economic Development Plan. Future Plans: SCERP/EOP; Continuity of Operations Plan; Capital Improvement Plan; Facilities Management Plan |
| **2** | All Hazard | Develop emergency response plan with hazard data | M | Environmental Department | FEMA EMPG; FEMA HMA; FEMA HMGP; AK DHS&EM; ANTHC; Denali Commission | Plans and Regulations | All | 3-4 years | B/C: This project would establish procedures and incorporate hazard information into emergency response planning to improve coordination and decision-making during disasters. TF: This project is technically feasible using established emergency planning guidance and available hazard data, with coordination from technical and emergency management agencies as needed. | Existing Plans: Local Economic Development Plan. Future Plans: SCERP/EOP; Emergency Response Plan; Emergency Preparedness Plan; Comprehensive Plan |
| **3** | Dam Failure | Support formal dam failure inundation mapping for Humboldt Creek Reservoir Dam and New England Fish Co Dam. | H | Environmental Department | FEMA HHPD; FEMA HMA; FEMA HMGP; USACE; AK DNR; AK DHS&EM | Plans and Regulations | Humboldt Creek Reservoir Dam, New England Fish Co Dam, Other | 0-2 years | B/C: Formal dam failure inundation mapping would identify areas potentially affected by failure of Humboldt Creek Reservoir Dam and New England Fish Co Dam and help focus future mitigation and emergency planning efforts. TF: This project is technically feasible using established dam failure modeling methods and technical assistance from State and Federal agencies. | Existing Plans: Local Economic Development Plan. Future Plans: SCERP/EOP; Dam Safety Plan; Emergency Response Plan; Comprehensive Plan; Capital Improvement Plan |
| **4** | Earthquake | Continue to support public education and outreach materials to mitigate impacts of earthquake in community | H | Environmental Department | FEMA EMPG; FEMA HMA; FEMA HMGP; AK DHS&EM; AK Earthquake Center/UAF | Education and Awareness Programs | All | 0-2 years | B/C: Continued earthquake education would improve community awareness of earthquake hazards and help residents understand appropriate preparedness and protective actions. TF: This project is technically feasible using established public outreach methods and State and Federal earthquake preparedness guidance. | Existing Plans: Local Economic Development Plan. Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Comprehensive Plan |
| **5** | Flood | Support construction of sea wall to protect coastal infrastructure from King tides | M | Environmental Department | FEMA HMA; FEMA HMGP; USACE; NOAA; AK DOT&PF; Denali Commission; ANTHC | Structure and Infrastructure Projects | Coastal Infrastructure | 3-4 years | B/C: A seawall would help protect coastal infrastructure from king tides and associated flooding, erosion, and wave impacts. TF: This project is technically feasible using established coastal engineering methods but would require site-specific engineering, permitting, funding, and ongoing maintenance. | Existing Plans: Local Economic Development Plan; EPA Tribal Environmental Plan. Future Plans: Capital Improvement Plan; Coastal Management Plan; SCERP/EOP; Comprehensive Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **6** | Flood | Support efforts to protect the airport runway from coastal flooding/storm surge/king tide, such as a sea wall. | M | Environmental Department | FEMA HMA; FEMA HMGP; FHWA PROTECT; AK DOT&PF; USACE; NOAA; Denali Commission | Structure and Infrastructure Projects | Airport Runway | 3-4 years | B/C: Protecting the airport runway from coastal flooding, storm surge, and king tides would help maintain a critical transportation link and emergency access to the community.<br>TF: This project is technically feasible using established coastal protection methods but may require engineering studies, permitting, coordination with transportation agencies, and significant funding. | Existing Plans: Local Economic Development Plan; Long-Range Transportation Plan.<br>Future Plans: Capital Improvement Plan; Transportation Plan; Coastal Management Plan; SCERP/EOP |
| **7** | Flood | Support efforts to mitigate the impact of high tides on the Harbor Road. | M | Environmental Department | FEMA HMA; FEMA HMGP; USACE; NOAA; AK DOT&PF; Denali Commission | Structure and Infrastructure Projects | Road | 3-4 years | B/C: Mitigating high-tide impacts along Harbor Road would help reduce flooding and access disruptions affecting transportation and harbor-related infrastructure.<br>TF: This project is technically feasible using established coastal protection and roadway improvement methods but may require engineering assessment, permitting, and outside funding. | Existing Plans: Local Economic Development Plan; Long-Range Transportation Plan.<br>Future Plans: Transportation Plan; Capital Improvement Plan; SCERP/EOP |
| **8** | Invasive Species | Continue to support education and outreach materials to distribute to residents about invasive plants, how to recognize them, and how to remove them. | H | Environmental Department | USDA; USFWS; AK DEC; ADF&G; AKEPIC; FEMA EMPG | Education and Awareness Programs | N/A | 0-2 years | B/C: Continued invasive plant education would improve residents' ability to identify and remove invasive species and help reduce their spread and impacts on the local environment.<br>TF: This project is technically feasible using established public outreach methods, educational materials, and available invasive species identification and removal guidance. | Existing Plans: Local Economic Development Plan; EPA Tribal Environmental Plan.<br>Future Plans: Environmental Plan; Natural Resources Plan; Public Information/Outreach Plan; SCERP/EOP |
| **9** | Severe Weather | Support Installation triple pane windows in all critical facilities to harden structures from extreme cold and high winds | M | Environmental Department | FEMA HMA; FEMA HMGP; USDA RD; Denali Commission; ANTHC; AK DHS&EM | Structure and Infrastructure Projects | All | 3-4 years | B/C: Installing triple-pane windows at critical facilities would improve building resilience to extreme cold and high winds while reducing potential damage and heat loss.<br>TF: This project is technically feasible using commercially available high-performance windows but may require site-specific assessment, installation, and funding. | Existing Plans: Local Economic Development Plan.<br>Future Plans: Capital Improvement Plan; Facilities Management Plan; SCERP/EOP; Continuity of Operations Plan |
| **10** | Severe Weather | Collaborate with City or external agencies to conduct public education activities, especially extreme cold and high wind. | H | Environmental Department | FEMA EMPG; FEMA HMA; AK DHS&EM; NOAA; AK DGGS; ANTHC | Education and Awareness Programs | All | 0-2 years | B/C: Public education on extreme cold and high wind would improve community preparedness and help residents reduce potential health, property, and utility impacts.<br>TF: This project is technically feasible through established public outreach methods and State and Federal severe weather guidance. | Existing Plans: Local Economic Development Plan.<br>Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **11** | Severe Weather | Evaluate tribal critical facilities and tribal residences for roof retrofitting to protect against high winds | M | Environmental Department | FEMA HMA; FEMA HMGP; USDA RD; Denali Commission; ANTHC; AK DHS&EM | Natural Systems Protection | Tribal Critical Facilities and Homes | 3-4 years | B/C: Evaluating tribal critical facilities and residences for roof retrofits would identify vulnerabilities and help reduce potential wind damage to buildings and essential facilities. TF: This project is technically | Existing Plans: Local Economic Development Plan.<br>Future Plans: Capital Improvement Plan; Facilities Management Plan; SCERP/EOP; Comprehensive Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | feasible using established building assessment and wind-resistance methods but may require engineering evaluation and funding for identified improvements. | |
| **12** | Severe Weather | Harden water utilities to prevent from freezing during cold weather at tribal facilities and residences | M | Environmental Department | FEMA HMA; FEMA HMGP; USDA RD; USDA RUS; Denali Commission; ANTHC | Structure and Infrastructure Projects | Water Utilities | 3-4 years | B/C: Hardening water utilities against freezing would help maintain reliable water service and reduce damage to critical systems and residential infrastructure during extreme cold. TF: This project is technically feasible using established insulation, heat-tracing, and other freeze-protection methods but may require site-specific evaluation and maintenance. | Existing Plans: Local Economic Development Plan; EPA Tribal Environmental Plan. Future Plans: Water System/Utility Plan; Capital Improvement Plan; SCERP/EOP; Continuity of Operations Plan |
| **13** | Tsunami | Continue public education outreach materials that outlines tsunami evacuation routes and inundation mapping. | H | Environmental Department | FEMA EMPG; FEMA HMA; FEMA HMGP; NOAA NTHMP; AK DHS&EM; AK DGGS | Education and Awareness Programs | All | 0-2 years | B/C: Continued tsunami outreach would improve public understanding of evacuation routes, inundation areas, and appropriate protective actions during a tsunami. TF: This project is technically feasible using existing tsunami mapping, established public outreach methods, and State and Federal tsunami preparedness guidance. | Existing Plans: Local Economic Development Plan; Long-Range Transportation Plan. Future Plans: SCERP/EOP; Tsunami/Emergency Evacuation Plan; Public Information/Outreach Plan; Emergency Preparedness Plan |
| **14** | Volcano | Continue to support public education and outreach materials to mitigate impacts from volcanic eruptions in community | H | Environmental Department | FEMA EMPG; FEMA HMA; USGS/AVO; AK DHS&EM; AK DEC; ANTHC | Education and Awareness Programs | All | 0-2 years | B/C: Continued volcanic eruption education would improve community awareness of volcanic hazards and help residents understand appropriate protective and preparedness actions.<br><br>TF: This project is technically feasible using established public outreach methods and State and Federal volcanic hazard information. | Existing Plans: Local Economic Development Plan; EPA Tribal Environmental Plan. Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Comprehensive Plan |

### K.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Support the hardening of the water and sewer system to be more resilient against seismic events | Not a current priority. |
| Support seismic retrofitting at the Sand Point harbor/dock area and tribally owned facilities. | Not a current priority. |
| Install an additional tsunami siren to mitigate human injuries and fatalities during a tsunami event. | Not a current priority. |
| Update, as needed, emergency notification procedures and emergency planning for ashfall events | Not a current priority. |
| Support study of water treatment plant to ensure that ashfall can't enter the system | Not a current priority. |
| Fund education and outreach efforts related to volcanic ashfall, to possibly include "kits" with protective materials, masks, air filters, etc. | Not a current priority. |
| Procure funding to repair New England Fish CO Dam and Humboldt Creek Reservoir Dam to mitigate dam failure risk | Not a current priority. |
| Retrofit critical facilities to be more seismically resilient | Not a current priority. |
| Support the establishment of a marine cargo/vessel inspection station to ensure no new invasive species are introduced. | Not a current priority. |
| Consider the feasibility and scope of establishing a community-based monitoring program for invasive plants, including orange hawkweed, oxeye daisies, and creeping buttercups. | Not a current priority. |

# K.7 Plan Update

## K.7.1 Changes in Development, including in Hazard-Prone Areas (current and future)

### K.7.1.1 Changes in Development

This MJHMP is the first analysis for the Qagan Tayagungin Tribe. It is reported there has been little development in Sand Point between 2021 and 2026, and the City's overall vulnerability to natural hazards has not significantly changed.

### K.7.1.2 Future/Planned Development

Sand Point has no planned or anticipated future development projects within the community.

## K.7.2 Changes in Priorities and Mitigation Efforts

This MJHMP is the first analysis for the Qagan Tayagungin Tribe. It is reported that the City's priorities and goals in this HMP shifted towards brick-and-mortar mitigation projects. The highest priority for the City is repairing facilities and infrastructure that were damaged by earthquakes, including the culverts associated with the Humboldt Creek Dam.

# K.8 Plan Maintenance

## K.8.1 Planning Team MJHMP Maintenance Commitment

The Qagan Tayagungin Tribe is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.7.

The Qagan Tayagungin Tribe is committed to annually reviewing the Plan and Tribal staff will work to complete their review responsibilities.

## K.8.2 Continued Public Involvement

The Qagan Tayagungin Tribe is dedicated to continued public involvement over the next five years.

The Qagan Tayagungin Tribe will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2032.

Future engagement should also provide opportunities for Tribal citizens and other community knowledge holders to identify new local observations, environmental changes, subsistence-related impacts, traditional access concerns, and other knowledge relevant to hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where Indigenous Knowledge or other community-provided information is considered for incorporation into the MJHMP, appropriate attention should be given to Tribal review, attribution, sensitivity, and preferences regarding public disclosure.

## K.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The Qagan Tayagungin Tribe jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The Tribal Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### K.8.3.1.1 Implementing

Upon adoption of the Plan, the Qagan Tayagungin Tribe will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The Qagan Tayagungin Tribe will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### K.8.3.1.2 Monitoring

The Qagan Tayagungin Tribe will monitor the progress of mitigation actions on an annual basis. The Tribal Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### K.8.3.1.3 Evaluating

The Qagan Tayagungin Tribe will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

#### K.8.3.1.4 Updating

The Qagan Tayagungin Tribe will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.7. The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Annual reviews should also consider whether new Indigenous Knowledge, local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

Figure K-24 provides a visual of the HMP plan maintenance activities per year.

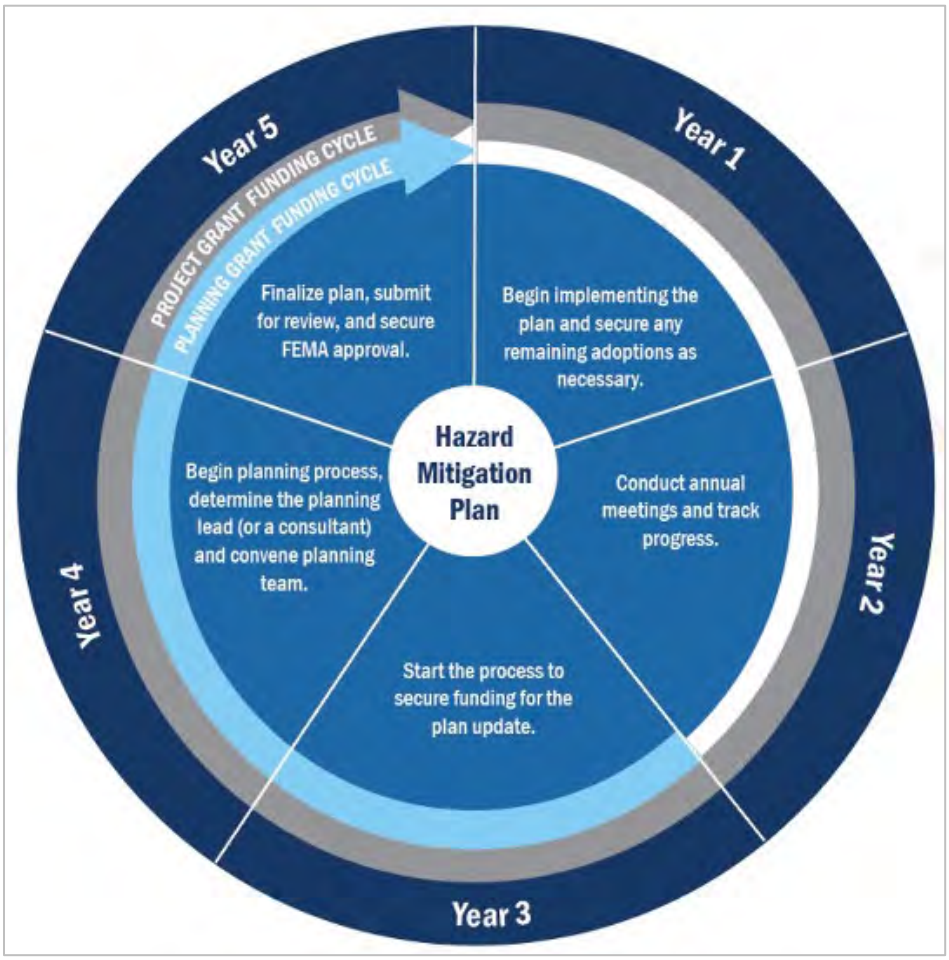



**Figure K-24- HMP Update Schedule**

## K.8.4 Plan Integration

The Qagan Tayagungin Tribe will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other planning and implementation processes, when appropriate including other FEMA programs and initiatives.

The Qagan Tayagungin Tribe will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include comprehensive and land use planning processes, economic development planning, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects as well as the upcoming APIA Regional Adaptation Plan.

As the plan is implemented, the Qagan Tayagungin Tribe will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## K.9 Plan Adoption

The Qagan Tayagungin Tribe of Sand Point Tribal Council formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

### K.9.1 Tribal Assurances

Qagan Tayagungin Tribe of Sand Point assures that the Tribal Planning Team and Tribal Council will comply with applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding (including 2 CFR Parts 200 and 3002) and will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes.

[insert signed adoption resolution]

# L. Pauloff Harbor Tribe



Photo Credit: Coast View

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# L.1 Planning Team and Tribal Definition of Public

## L.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Arlene Gunderson** | Tribal Administrator |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

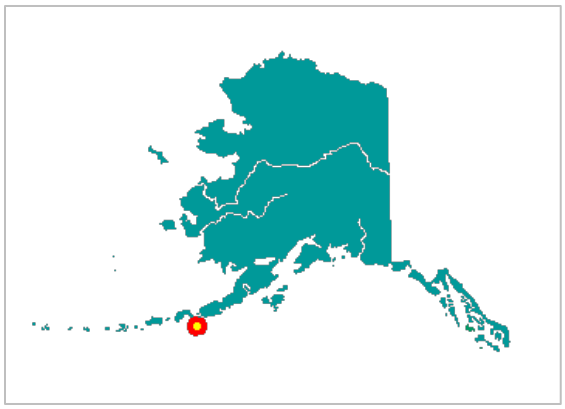
## L.1.2 Tribal Definition of Public

For this planning process, the Pauloff Harbor Tribe defines the “public” as enrolled Tribal citizens, residents of Sand Point, local businesses and employers, partner governments and organizations, and other individuals with knowledge of or an interest in hazards affecting the community. All community residents may complete surveys and comment on drafts, while the Tribal Council retains authority to adopt the plan for the Tribe.

This definition ensures that anyone who lives or works within the community, as well as enrolled Tribal Members residing outside the community, is eligible to attend and participate in the public involvement portion of the HMP Update planning process.

# L.2 Community Profile

## L.2.1 Location and Geography



Pauloff Harbor is an unincorporated community with no year-round population in the Aleutians East Borough**.** The historic village of Pauloff Harbor is located on the northern coast of Sanak Island in the eastern Aleutian Islands. It is situated on the western shore of Pavlov Harbor, approximately 50 miles southeast of False Pass**.**

Sanak Island is a remote island characterized by low-elevation, rolling terrain, numerous lakes, streams, wetlands, and coastal areas**,** with Sanak Peak reaching approximately 1,740 feet above sea level**.** The island is surrounded by numerous reefs and smaller islands, and the surrounding waters have historically supported productive commercial and subsistence fisheries.

The historic village of Pauloff Harbor is situated within a maritime climate zone, characterized by relatively moderate temperatures but substantial precipitation, snowfall, wind, and frequent coastal weather conditions. Available community information identifies typical temperatures ranging from approximately -9°F to 76°F, with average annual snowfall of approximately 52 inches and annual precipitation of approximately 33 inches**.**

The historic village site developed along the protected waters of Pavlov Harbor, which provided access to the surrounding marine resources. The harbor is surrounded by reefs that can make navigation challenging without local knowledge. The village's location provided a protected anchorage and access to fishing grounds, contributing to its historical development as a fishing and cod-processing settlement. The Tribe is now headquartered in Sand Point and Tribal members presently live in Sand Point, Anchorage, and other communities.

Pauloff Harbor is currently unoccupied on a year-round basis and has no public facilities. Access is primarily by floatplane or private boat from False Pass or King Cove. The community's remote island location, lack of permanent population and public infrastructure, limited transportation access, and dependence on marine and air transportation are important considerations for hazard mitigation planning. These characteristics may complicate emergency access, evacuation, damage assessment, delivery of resources, and recovery operations following severe weather, coastal hazards, flooding, erosion, earthquakes, or other disasters.

## L.2.2 History

Pauloff Harbor is a historic Unangan community located on the northern coast of Sanak Island. Sanak Island has been inhabited by Unangan people for thousands of years, with archaeological evidence indicating human occupation dating back approximately 7,000 years**.** Early historic accounts identify Unangan settlements on Sanak Island, including a village known as Kasiq near the present-day Pauloff Harbor area. Russian colonial authorities later displaced much of Sanak Island's Unangan population to the Alaska Peninsula in the early nineteenth century.

Pauloff Harbor developed as a commercial cod fishing station in 1886, established by the McCollam Fishing and Trading Company because of the area's proximity to productive cod fishing grounds and the protected anchorage provided by Pavlov Harbor. The station subsequently became associated with the Union Fish Company. During the late nineteenth and early twentieth centuries, fishermen—many of them Scandinavian immigrants—settled in the community and established families with local Unangan residents.

The community grew around the fishing industry and supporting commercial activities. By the early twentieth century, Pauloff Harbor included a store, trading post, fishing station, and residential community. Cod fishing provided the primary economic base for approximately 50 years. As cod abundance declined

during the 1930s, residents increasingly turned to salmon fishing and processing**,** with fishermen supplying the cannery at False Pass and producing salted salmon for shipment to Seattle. Subsistence hunting, fishing, and gathering also remained important to residents.

A U.S. post office was established at Pauloff Harbor in 1949, and mail was delivered by boat. The village continued to exist through the middle of the twentieth century, although its population gradually declined as residents left the island for employment and access to schools, medical services, churches, and other services in communities such as False Pass and Sand Point**.** The Bureau of Indian Affairs school eventually closed after the departure of its teacher, contributing to the village's continued population decline.

During World War II, Sanak Island was also used for military purposes. The U.S. Army established a Sanak Island Aircraft Warning Service station near Pauloff Harbor in 1943 as part of the Aleutian Islands warning network. The facility provided advance warning to military installations and remained in operation until the end of the war in 1945.

Pauloff Harbor's population continued to decline after World War II. The village appeared in the U.S. Census through 1970, but residents subsequently relocated to other communities. A small number of residents later returned to Sanak Island for cattle operations during the 1970s, but the operation was unsuccessful. The island is now unoccupied year-round, and the former village site has no permanent public facilities.

Today, Pauloff Harbor Village remains a federally recognized Unangan Tribal entity headquartered in Sand Point**.** Although the historic village is unoccupied, tribal members and descendants maintain connections to Sanak Island through subsistence, cultural activities, traditional lands, and family history. The historic village site and surrounding lands therefore remain important considerations for hazard mitigation planning, particularly because of their cultural significance and the area's limited access to emergency services and infrastructure.

## L.2.3 Population

Pauloff Harbor is an unincorporated historic village site with no year-round residential population**.** The former village is located on Sanak Island and has not reported a resident population in the U.S. Census since it was identified as an Alaska Native Village Statistical Area in 1980. The village has no permanent public facilities, and access is primarily by boat or floatplane.

Although there is no permanent population at the historic village site, Pauloff Harbor Village remains a federally recognized Unangan (Aleut) tribe. Federal data used for the FY 2024 Indian Housing Block Grant identify 51 enrolled tribal members. This is a tribal enrollment figure and should not be interpreted as the number of people living at Pauloff Harbor.

The Tribe is headquartered in Sand Point**,** where Tribal administration and services are maintained. APIA currently identifies a Pauloff Harbor Tribal Administrator, and Tribal members may reside in Sand Point, Anchorage, and other communities.

Regarding hazard mitigation planning, the distinction between the historic village population and the current tribal population is important. Hazards affecting Sanak Island may primarily affect seasonal visitors, subsistence users, and Tribal members accessing traditional lands and waters. In contrast, hazards affecting Sand Point may directly affect a larger portion of the Pauloff Harbor tribal community through impacts to housing, transportation, utilities, employment, healthcare, and other essential services. The absence of a permanent population at Pauloff Harbor also means that emergency response planning must account for limited communications, transportation, emergency services, and evacuation options for people who may be present at the site.

## L.2.4 Demographics

Pauloff Harbor Village is a federally recognized Unangan (Aleut) Tribe associated with the historic community of Pauloff Harbor on Sanak Island. The historic community is no longer occupied year-round, and there is currently no permanent residential population at Pauloff Harbor**.** The Tribe's headquarters is located in Sand Point, where the tribe maintains its administrative presence and where most of the village corporation's shareholders reside.

Available tribal enrollment data identify approximately 51 enrolled members of Pauloff Harbor Village. This figure comes from federal data and should be treated as an enrollment figure rather than a count of people currently residing at the historic community site. More recent public sources confirm the Tribe's continued federal recognition but do not provide a newer enrollment total.

Historical census information demonstrates the community's changing demographic composition. In 1910, Pauloff Harbor had a population of approximately 25 people, including 17 residents identified as Aleut. Historical accounts indicate that foreign-born fishermen increasingly established families with local Aleut women, contributing to a mixed community connected to both the commercial fishing industry and the area's Unangan population.

Today, demographic considerations for Pauloff Harbor extend beyond the unoccupied historic village. Tribal members and descendants are primarily connected to Sand Point and other regional communities, while maintaining cultural, subsistence, and family connections to Sanak Island. APIA programs recognize Pauloff Harbor Tribal membership among their eligible service populations, including members residing in Sand Point and Anchorage.

For hazard mitigation planning, the distinction between the historic village population and the current tribal population is important. Hazards affecting Sanak Island may primarily affect seasonal visitors, subsistence users, and tribal members accessing traditional lands and waters, while hazards affecting Sand Point may directly affect a larger portion of the Pauloff Harbor tribal community through impacts to housing, employment, transportation, utilities, healthcare, and other essential services. The remote location of the historic village and its lack of permanent public infrastructure also create challenges for emergency access, evacuation, communications, and delivery of assistance.

## L.2.5 Economy

Pauloff Harbor historically supported a commercial fishing-based economy, primarily centered on the productive cod fisheries surrounding Sanak Island. A codfish station was established at Pauloff Harbor in the late 1800s, and commercial fishing provided the economic foundation for the community for approximately 50 years. When the local cod fishery declined in the 1930s, residents transitioned increasingly to salmon fishing associated with the cannery at False Pass. Fishing, fish processing, and related maritime activities remained important sources of employment and income until the population gradually relocated to larger communities in the region, particularly Sand Point, False Pass, and King Cove.

Pauloff Harbor currently has no established employment base or active commercial economy at the historic village site. The village site is unoccupied year-round, and the Aleutian Pribilof Islands Association identifies no current employment or public facilities at the site. The surrounding waters and lands remain economically and culturally significant, however, because they provide opportunities for subsistence fishing, hunting, gathering, and other traditional activities. The Pauloff Harbor Tribal Council has historically identified the area's abundant fish and wildlife resources as important to the community's subsistence lifestyle.

Much of the contemporary economic activity associated with Pauloff Harbor occurs outside the historic village, particularly in Sand Point. Many Pauloff Harbor tribal members and village corporation shareholders reside in Sand Point, where they participate in the regional commercial fishing, seafood processing, government, transportation, and service economies. Consequently, economic disruptions in Sand Point and other regional communities can affect the broader Pauloff Harbor tribal community even though no permanent population remains at the historic village site.

For hazard mitigation planning purposes, economic impacts at Pauloff Harbor are therefore most likely to involve disruption or damage to subsistence resources, fishing areas, boats and equipment, culturally important lands, and access to Sanak Island rather than conventional commercial businesses. Coastal storms, erosion, flooding, earthquakes, severe weather, or marine transportation disruptions could restrict access to subsistence areas and increase the cost and difficulty of transporting people, equipment, and supplies to the island. Because Tribal members and shareholders are primarily based elsewhere, impacts to regional transportation, fisheries, employment, and services in communities such as Sand Point may also have indirect economic effects on the Pauloff Harbor community.

## L.2.6 Land Use

Pauloff Harbor is an unoccupied historic village site on Sanak Island with no permanent residential development or public facilities. The area contains remnants of the former village, including deteriorated structures and infrastructure associated with its historic residential, commercial fishing, and military uses. Transportation to the area is primarily by personal boat or floatplane, and there is no developed road network or municipal infrastructure serving the community at the Pauloff Harbor historic village site.

Land ownership on Sanak Island is primarily associated with Alaska Native corporations. The Sanak Corporation is the current surface landowner, while the Aleut Corporation holds subsurface rights. Portions of the island, including areas associated with the historic Pauloff Harbor village, also have interests associated with the Pauloff Harbor Tribe. Most of the island was conveyed through the Alaska Native Claims Settlement Act (ANCSA) in 1981. Pauloff Harbor is also identified by the State of Alaska as a Municipal Lands Trustee community, although no municipal trust lands are currently reported for the community.

Current land use is primarily seasonal and includes subsistence, cultural, recreational, and traditional activities. Members of the Pauloff Harbor Tribe and Sanak Corporation, as well as residents of nearby communities, continue to access Sanak Island for fishing, hunting, gathering, and other traditional activities. Feral cattle and horses also remain on the island as a legacy of historic grazing operations, with feral cattle providing a subsistence resource for members of the Sanak Corporation and Pauloff Harbor Tribe.

For hazard mitigation planning purposes, the absence of permanent development does not eliminate the potential for impacts at Pauloff Harbor. Coastal erosion, flooding, severe storms, earthquakes, landslides, and other hazards could affect historic structures, cultural resources, subsistence areas, transportation access, and other resources used by tribal members and seasonal visitors. The remote location and lack of permanent infrastructure also create challenges for emergency access, evacuation, communications, damage assessment, and response. Future land management or development activities should account for ANCSA land ownership, tribal and corporation interests, cultural resources, subsistence use, and the limited availability of emergency services on Sanak Island.

## L.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following jurisdictional-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **2007 Pauloff Harbor Draft Long Range Transportation Plan** | Provides details on long-term community access needs and prioritized local road and infrastructure projects. | Reviewed to identify infrastructure and inform risk assessment. |
| **2006 Pauloff Harbor Tribe Tribal Economic Development Plan** | Describes community and economic development goals including preserving history and culture while improving quality of life through increased economic development including fish processing and tourism. | Used relevant information to develop the Community Profile. |
| **2010, 2021 Aleutians East Borough Hazard Mitigation Plans** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **1970 Sand Point Comprehensive Plan** | Provides details on the history, economy, land use, critical facilities, and transportation in Sand Point. | Used relevant information to develop the Community Profile. |
| **1977 City of Sand Point Comprehensive Plan** | | |
| **City of Sand Point Alaska 1981 Comprehensive Plan** | | |
| **2004 City of Sand Point Comprehensive Community Development Plan** | | |
| **2003 Harbor Land Use Plan for Sand Point Alaska** | Lays out a strategy for improving and expanding the city's harbor by organizing land and leases and adding off-loading and storage capacity. | Used to analyze the harbor's vulnerability to natural hazards. |

# L.4 Risk Assessment

## L.4.1 Hazards

This Risk Assessment assesses risk to both the Historical Pauloff Harbor Village geography as well as Sand Point, where the majority of Tribal Members live.

**The Pauloff Harbor Tribe Planning Team identified the following natural hazards that may impact the Historical Pauloff Harbor Village/Sanak Island.**

- ✓ Hazard profiled for this jurisdiction in the MJHMP Update
- X Hazard not profiled for this jurisdiction in the MJHMP Update

- X Changes in the Cryosphere- Sea Ice
- X Changes in the Cryosphere- Snow Avalanche
- ✓ Dam Failure
- ✓ Earthquake
- ✓ Flood
- ✓ Ground Failure/Landslide
- ✓ Invasive Species
- ✓ Land Destabilization
- ✓ Severe Weather
- ✓ Tsunami
- ✓ Volcano
- X Wildland Fire

| Pauloff Harbor Village/Sanak Island | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| Cryosphere- Sea Ice | Did not profile this hazard. | | |
| Cryosphere- Snow Avalanche | Did not profile this hazard. | | |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap. The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, Sanak Island itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 4- Highly Likely | 3- Critical | Sediment deterioration and land destabilization can occur throughout Sanak Island, with coastal land destabilization being the biggest concern for the community. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline. |
| Flood | 3- Likely | 2- Limited | The Planning Team reports that low-lying waterfront areas on Sanak Island have experienced coastal flooding, storm surge, and high tides. |

| Pauloff Harbor Village/Sanak Island | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| | | | The Planning Team reports that low-lying waterfront areas are most impacted by storm events. |
| Ground Failure/ Landslide | 2- Possible | 2- Limited | Sanak Island is prone to landslides due to steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity. |
| Severe Weather | 4- Highly Likely | 3 - Critical | The entire geography of Sanak Island is susceptible to severe weather events and impacts. The Planning Team reports experiencing coastal storms, dense fog, and high winds |
| Tsunami | 3- Likely | 4- Catastrophic | According to FEMA's National Risk Index, the tsunami risk for Sanak Island is Relatively Moderate. According to the State of Alaska DHS&EM, Sanak Island has local tsunami potential and a medium risk of distant tsunami potential.<br>There is no formal tsunami inundation mapping for Sanak Island. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of Sanak Island is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Aleutian volcanos.<br>Volcanic ashfall is the primary volcanic hazard that may impact Sanak Island. |
| Wildland Fire | 2- Possible | 2- Limited | The State of Alaska rates Sanak Island as having relatively low risk of wildland fires. There is no recorded history of wildland fires in Sanak Island. |
| Dam Failure | Did not profile this hazard. | | |
| Invasive Species | 2- Possible | 2- Limited | Invasive species pose a potential threat to the ecological, economic, and cultural resources of Sanak Island. The community's reliance on marine transportation, air travel, fishing, and freight creates pathways for invasive plants, insects, wildlife, and marine organisms to be introduced through contaminated cargo, equipment, vessels, and fishing gear. Once established, invasive species could displace native species, alter wildlife and marine habitats, affect subsistence and commercial fisheries, and increase costs associated with monitoring and control. |

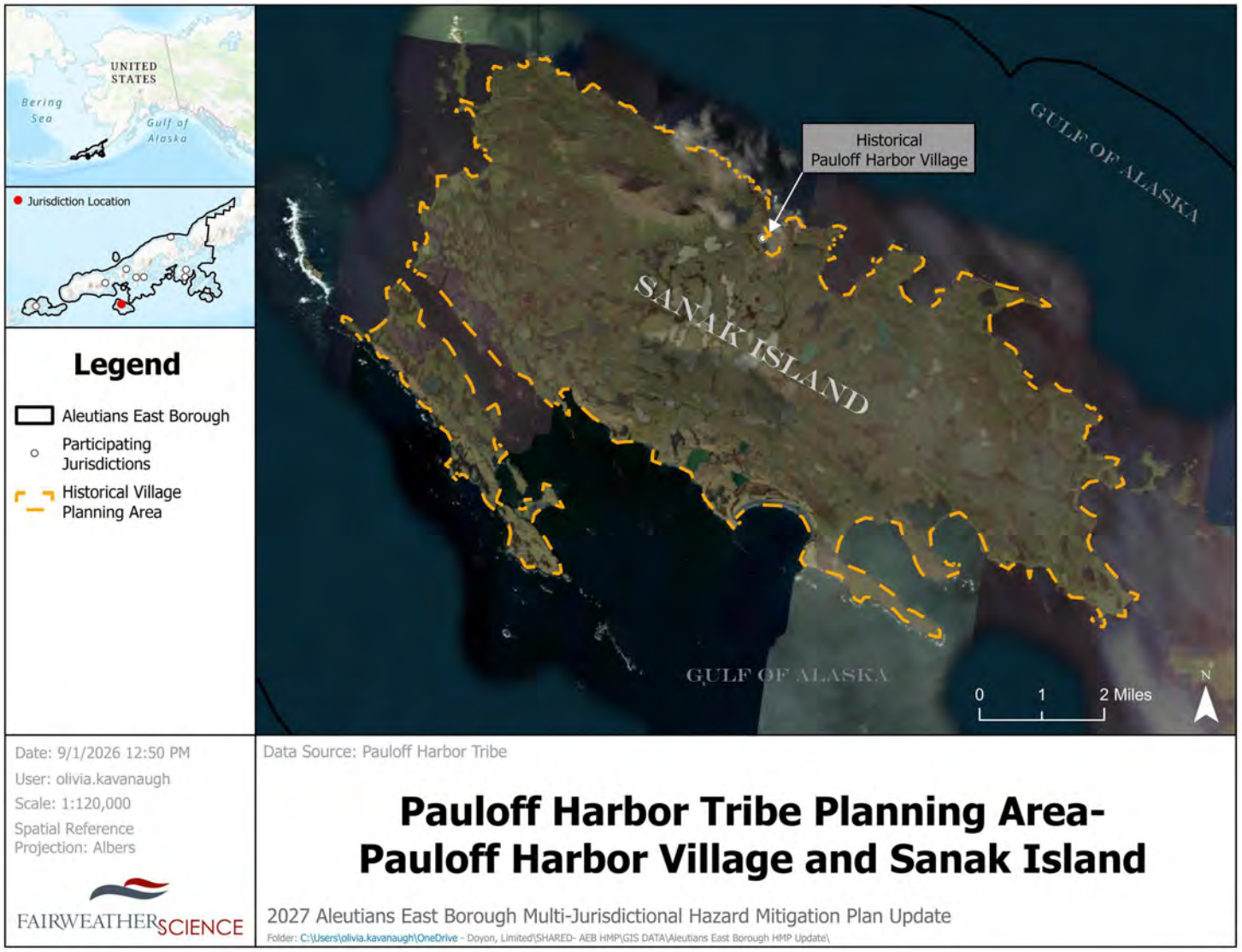



**Figure L-1- Pauloff Harbor Tribe Planning Area- Pauloff Harbor Village and Sanak Island**

**The Pauloff Harbor Tribe Planning Team identified the following natural hazards that may impact their assets and Tribal members in Sand Point.**

✓ Hazard profiled for this jurisdiction in the MJHMP Update
X Hazard not profiled for this jurisdiction in the MJHMP Update

X Changes in the Cryosphere- Sea Ice
X Changes in the Cryosphere- Snow Avalanche
✓ Dam Failure
✓ Earthquake
✓ Flood
X Ground Failure/Landslide
✓ Invasive Species
✓ Land Destabilization
✓ Severe Weather
✓ Tsunami
✓ Volcano
✓ Wildland Fire

| Sand Point Geography | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| Cryosphere- Sea Ice | Did not profile this hazard. | | |
| Cryosphere- Snow Avalanche | Did not profile this hazard. | | |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and Sand Point itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 2- Possible | 2- Limited | Sediment deterioration and land destabilization can occur throughout Sand Point, with coastal land destabilization being the biggest concern for the community. Since Sand Point is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline. |
| Flood | 3- Likely | 2- Limited | The Planning Team reports that low-lying waterfront areas in Sand Point have experienced coastal flooding, storm surge, and high tides.<br>The Planning Team reports that low-lying waterfront areas are most impacted by storm events. |
| Ground Failure/ Landslide | Did not profile this hazard. | | |

| Sand Point Geography | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of Sand Point is susceptible to severe weather events and impacts. The Planning Team reports experiencing coastal storms, dense fog, and high winds. |
| Tsunami | 3- Likely | 3- Critical | According to FEMA's National Risk Index, the tsunami risk for Sand Point is Relatively Moderate. According to the State of Alaska DHS&EM, Sand Point has local tsunami potential and a medium risk of distant tsunami potential. |
| Volcano | 3- Likely | 3- Critical | The entire geography of Sand Point is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Aleutian volcanos.<br>Volcanic ashfall is the primary volcanic hazard that may impact Sand Point |
| Wildland Fire | 2- Possible | 2- Limited | The State of Alaska rates Sand Point as having relatively low risk of wildland fires. There is no recorded history of wildland fires in Sand Point. |
| Dam Failure | 2- Possible | 3- Critical | There are two (2) Significant Hazard Potential Dams in Sand Point.<br>Humboldt Creek Reservoir Dam and New England Fish CO Dam, located in Sand Point, have no history of dam failure.<br>Formal dam failure inundation mapping is not available for either dam. |
| Invasive Species | 3- Likely | 2- Limited | Invasive species pose a potential threat to the ecological, economic, and cultural resources of Sand Point and surrounding Popof Island. The community's reliance on marine transportation, air travel, fishing, and freight creates pathways for invasive plants, insects, wildlife, and marine organisms to be introduced through contaminated cargo, equipment, vessels, and fishing gear. Once established, invasive species could displace native species, alter wildlife and marine habitats, affect subsistence and commercial fisheries, and increase costs associated with monitoring and control. |

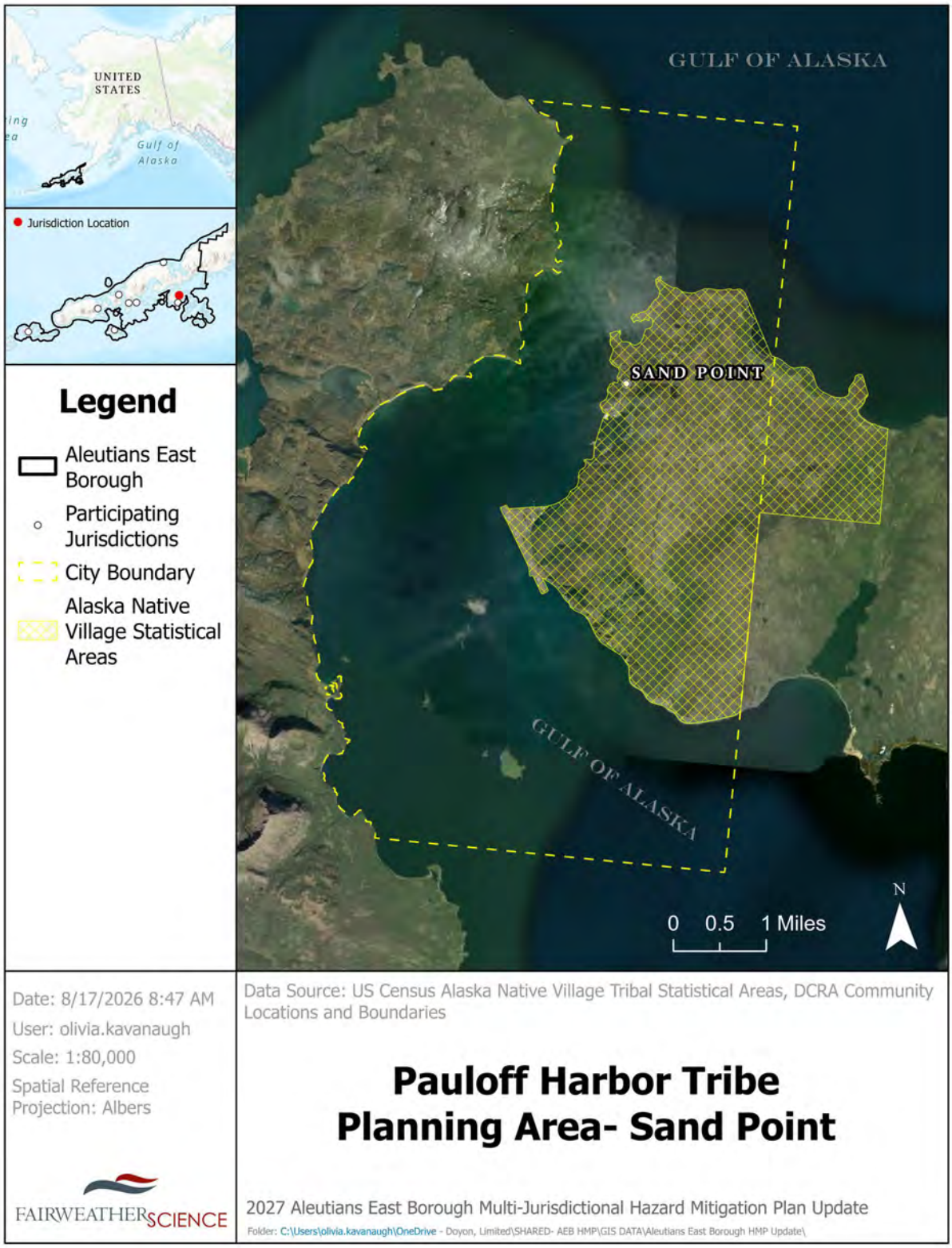



**Figure L-2- Pauloff Harbor Tribe Planning Area- Sand Point**

#### L.4.1.1 Changes in the Cryosphere – Snow Avalanche

The Pauloff Harbor Tribe Planning Team did not select this hazard for the MJHMP.

### L.4.1.2 Changes in the Cryosphere – Sea Ice

The Pauloff Harbor Tribe Planning Team did not select this hazard for the MJHMP.

### L.4.1.3 Dam Failure

There are no dams on Sanak Island that could potentially impact Pauloff Harbor Village.

There are two dams in Sand Point- Humboldt Creek Reservoir Dam and New England Fish Co Dam.

#### L.4.1.3.1 Location

There are two dams located in the City limits of Sand Point. Both dams are classified as having Significant Hazard Potential. These dams are the Humboldt Creek Reservoir Dam, and the New England Fish Co Dam. These dams are profiled below.

| NID ID #AK00268 Humbolt Creek Reservoir Dam | |
|---|---|
| Hazard Classification | Significant |
| Owner | City of Sand Point |
| Year Built | Unknown |
| Dam Type | Earth |
| Dam Purpose | Water Supply |
| Length x Height | 395 ft x 19 ft |
| Drainage Area | 4.7 square miles |
| Inspection Frequency | The most recent inspection date is January 21, 2022. The dam is inspected every three years. |
| Downstream Description | There are four culverts in the dam embankment that drain water from the dam, creating a stream that flows into the ocean. Approximately 800 feet downstream of the dam outflow, Humboldt Creek widens to almost 300 feet when reaching the tidal zone. The downstream area is treeless and compromised of tundra plants and low-lying brush. |
| Downstream Area | The Humboldt Creek Reservoir Dam downstream area contains industrial/commercial property, both primary and secondary roads, utilities, and a small boat harbor. |
| Downstream Dams | There are no dams immediately downstream of the Humboldt Creek Reservoir Dam. |
| Downstream Bridges | There are two bridges downstream of the Humboldt Creek Reservoir Dam. One is a pedestrian bridge and a vehicle bridge. The vehicle bridge is on Sand Point Rd, and the pedestrian bridge connects the small boat harbor to the northern peninsula across from the small boat harbor. Airport Road also crosses over the top of the dam. |
| Reservoir Area | The maximum impoundment volume is 55-acre feet, with a reservoir maximum storage surface area of 11 acres. The reservoir is approximately 800 feet long and 360 feet wide. |
| Downstream Development | Sand Point lies approximately 0.4 miles to the west of the dam. In the tidal zone, which is approximately 250 yards beyond the dam outflow, is a large amount of development. There is Sand Point Rd and bridge, the Robert E. Galovin Small Boat Harbor and its pedestrian bridge. There is also the Trident Seafoods Processing plant. |
| Overall assessment of the 2022 inspection | At the time of the most recent inspection, the condition assessment of the dam was rated as Poor. The primary reason for the designation was due to a crack in the earthen embankment and buckling of culverts that run through the dam embankment. These are likely due to recent earthquakes occurring in the vicinity of Sand Point. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026, Terra Firma Testing 2022

| NID ID #AK00122 New England Fish CO Dam | |
|---|---|
| Hazard Classification | Significant |
| Owner | Shumagin Corporation |
| Year Built | 1940 |
| Dam Type | Earth |
| Dam Purpose | Water Supply |
| Length x Height | 283 ft x 10 ft |
| Drainage Area | Unknown |
| Inspection Frequency | The most recent inspection is unknown. Inspection frequency is every 5 years. |
| Downstream Description | New England Fish CO Dam is located approximately 0.6 miles from Popof Straight, where the outflow creek terminates after crossing underneath the Sand Point Airport. |
| Downstream Area | The New England Fish CO Dam structure discharges into its outflow creek. The creek flows through a narrow, deep canyon before up against the Sand Point Airport and discharging in Popof Straight. The drainage canyon is heavily brushed with no infrastructure. There is the Old Reservoir to Red Cove Trail to the south of the outflow creek and several unnamed access trails to the north of the access creek. They meet at the top of the dam. |
| Downstream Dams | There are no dams immediately downstream of New England Fish CO Dam. |
| Downstream Bridges | There is one (1) bridge downstream of New England Fish CO Dam. The outflow creek flows up against the east side of the Sand Point Airport runway and then turns south and crosses under a trail bridge. Additionally, there is a motorized trail that runs across the top of the dam. |
| Reservoir Area | New England Fish CO dam has a maximum capacity of 105-acre feet and a surface area of 8.5 acres. The reservoir is approximately 1000 feet long and 580 feet wide. |
| Downstream Development | The major downstream development of New England Fish CO Dam is the Sand Point Airport. The runway butts against the outflow creek, where it then turns sharply parallel to the runway. The airport terminal and support structures are located on the northeast side of the runway, and these structures are protected from potential inundation due to Arch Rock and the surrounding hill between the infrastructure and the outflow creek. |
| General findings of the most recent inspection | A preliminary inspection by the State of Alaska Dam Safety Engineer, based on observations, rated the dam in Unsatisfactory Condition. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. Potential inundation of Sand Point Airport runway and Old Reservoir to Red Cove Road could delay or prohibit air transportation to and from Sand Point. |
| Recommended Hazard Potential Classification | The State of Alaska Dam Safety Engineer has recommended classifying this dam as having Significant Hazard Potential. Due to the proximity to the airport, other downstream development and potential loss of life, this recommendation is accurate and justified based on current classification guidelines. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026

#### L.4.1.3.2 History

There is no record of historical dam failure in Sand Point.

Both dams have damage that has been observed. Humboldt Creek Reservoir Dam has damage to its outflow culverts and a large crack in the earthen embankment (Terra Firma Testing 2022). New England Fish CO Dam has been observed to have seepage issues (State of Alaska Dam Safety Engineer 2026).

#### L.4.1.3.3 Extent (Magnitude and Severity)

Humboldt Creek Reservoir Dam

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

New England Fish CO Dam

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

Potential inundation area was assumed to extend 1 mile downstream from the dams, and 0.1 miles in either direction of the outflow route.

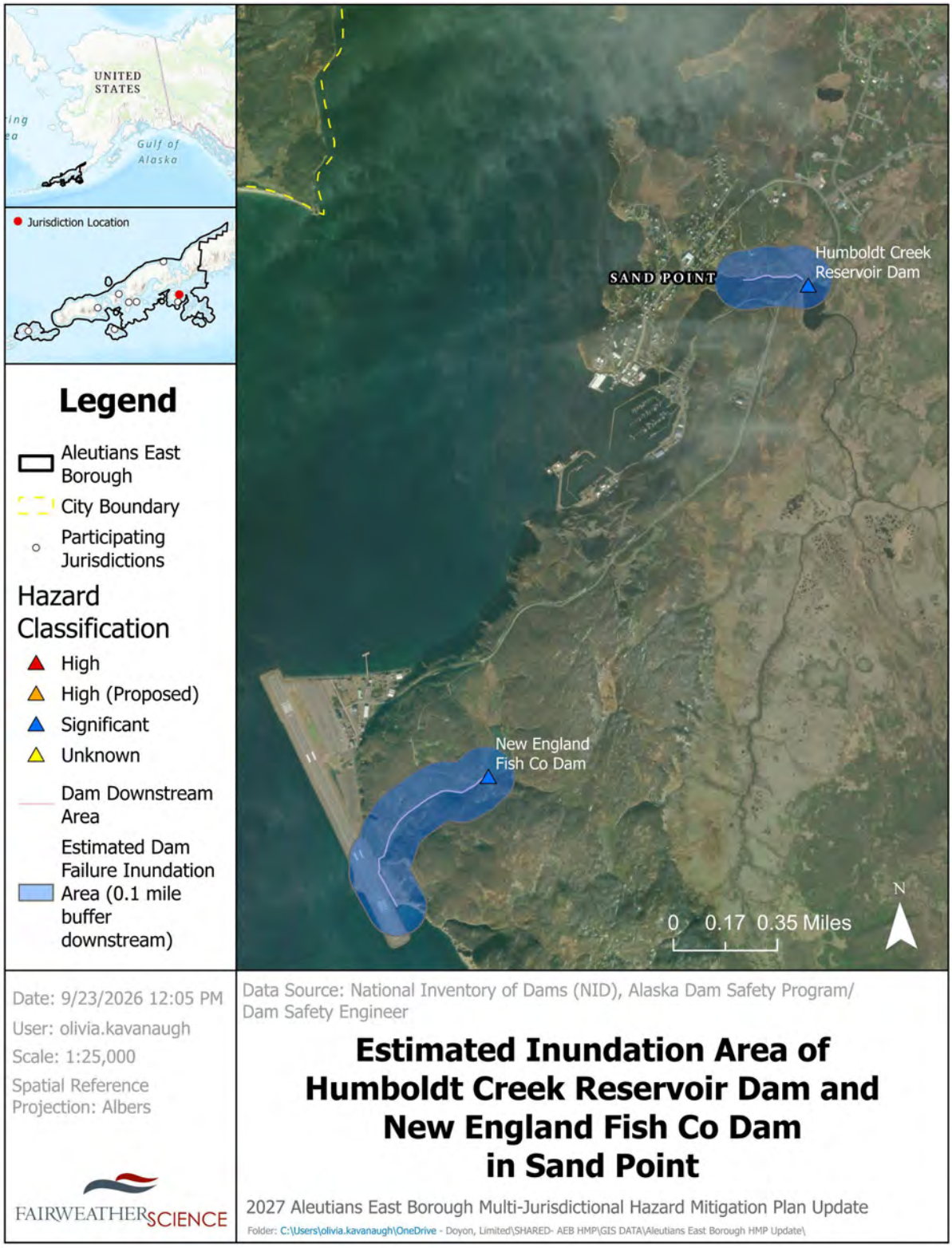



**Figure L-3- Potential Dam Inundation in Sand Point**

Based on estimated inundation area and the criteria identified in Table 5 of the Base Plan, the magnitude and severity of dam failure in Sand Point is **Critical** with multiple deaths and severe injuries; medium shutdown of some critical infrastructure and facilities; 20% to 50% of residential and 10-25% of commercial structures are severely damaged; and large impacts to local operations for long amounts of time

#### L.4.1.3.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | The Pauloff Harbor Planning Team did not report specific previous impacts related to dam failure in this category. |
| Infrastructure | Humboldt Creek Reservoir Dam presumably damaged from earthquakes in the last 6 years. The City of Sand Point also cites damage to the city dock and numerous culverts as being previously damaged by earthquakes. Critical facilities at risk of dam inundation include the Salmon Hatchery, Aquaculture Building, Volunteer Fire Department Building, City Pump House, two Water Tanks, Humboldt Creek Reservoir Dam, and New England Fish CO Dam. |
| People | The Pauloff Harbor Planning Team did not report specific previous impacts related to dam failure in this category. |
| Utilities | The Pauloff Harbor Planning Team did not report specific previous impacts related to dam failure in this category. |
| Transportation | The Pauloff Harbor Planning Team did not report specific previous impacts related to dam failure in this category. |
| Economy | There are no recorded economic impacts from dam failure in Sand Point. |
| Subsistence Resources | The Pauloff Harbor Planning Team did not report specific previous impacts related to dam failure in this category. |

#### L.4.1.3.5 Probability of Future Events

Based on the criteria listed in Table 6 of the Base Plan and the most recent condition assessments, it is **Possible** that Sand Point will experience a dam failure event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

However, the State of Alaska Dam Safety Engineer warned of “condition creep”, where observational assessments have rated dams more poorly than their most recent available condition rating. If dams in Sand Point continue to deteriorate with no intervention, the probability of a dam failure may increase in the future.

#### L.4.1.3.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in Sand Point. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in Sand Point. However, changing factors that influence the potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in Sand Point. A potential outcome of changing climate in Alaska is an |

| Description of Future Conditions | |
|---|---|
| | increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in Sand Point. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in Sand Point. Increased precipitation and frequency of severe weather events could contribute to more stress on dams in the Sand Point Planning Area. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in Sand Point as residents may relocate in and out of potential future inundation areas. Residents of Sand Point may also relocate out of the area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in Sand Point. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted in inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

### L.4.1.4 Earthquake

#### L.4.1.4.1 Location

The entire geography of Sand Point, where Pauloff Harbor Tribe is headquartered, as well as traditional lands on Sanak Island where Pauloff Harbor Village is located, is vulnerable to earthquakes, due to its location on the Alaska-Aleutian subduction zone.

According to the 2023 State of Alaska HMP, Sand Point and Sanak Island are located in areas with the potential of **Severe** perceived shaking from earthquakes (PGA 34 – 65). Perceiving shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. These maps focus on the actual variations in shaking intensity across a region as felt by people and structures.

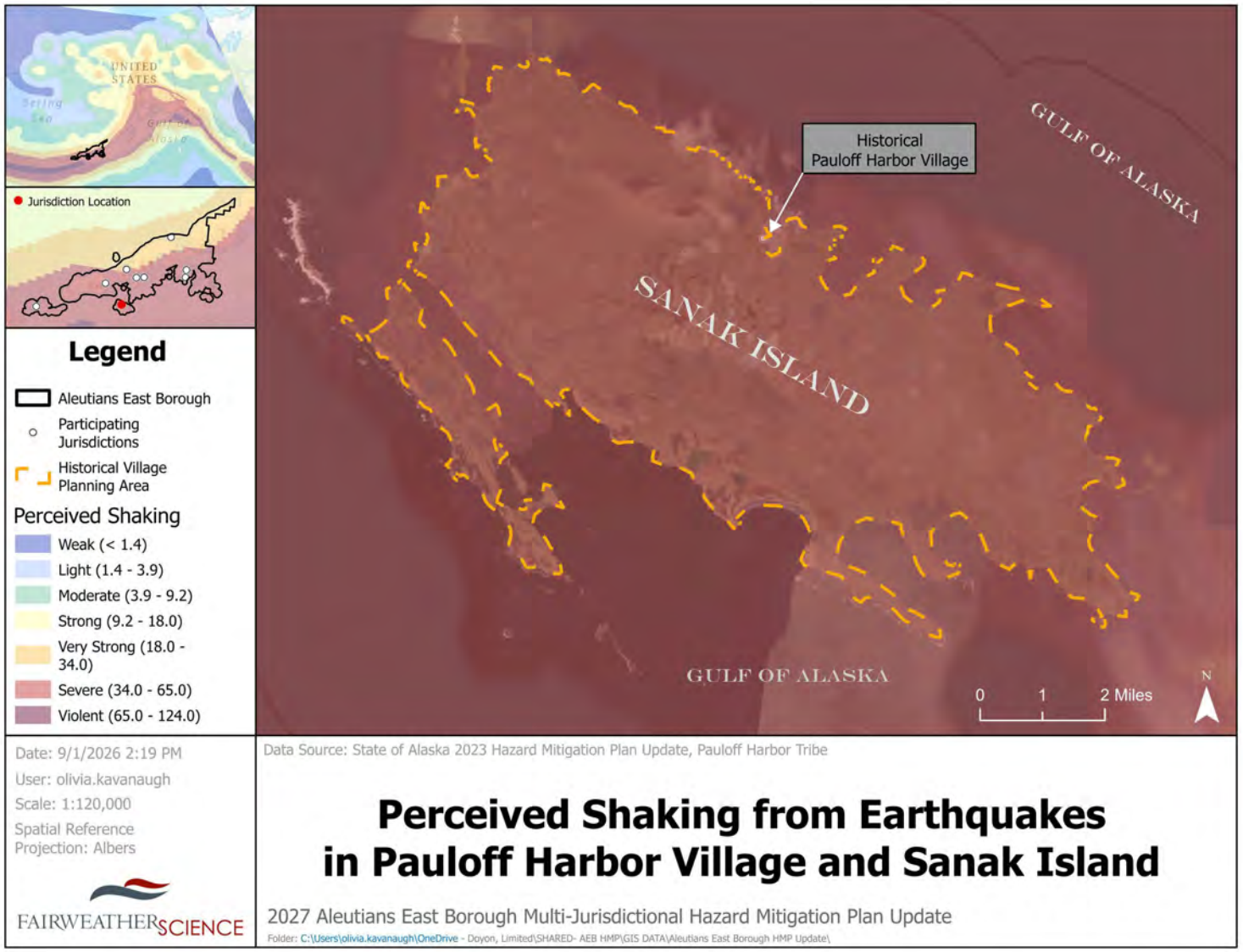



**Figure L-4 - Perceived Shaking from Earthquakes in Pauloff Harbor**

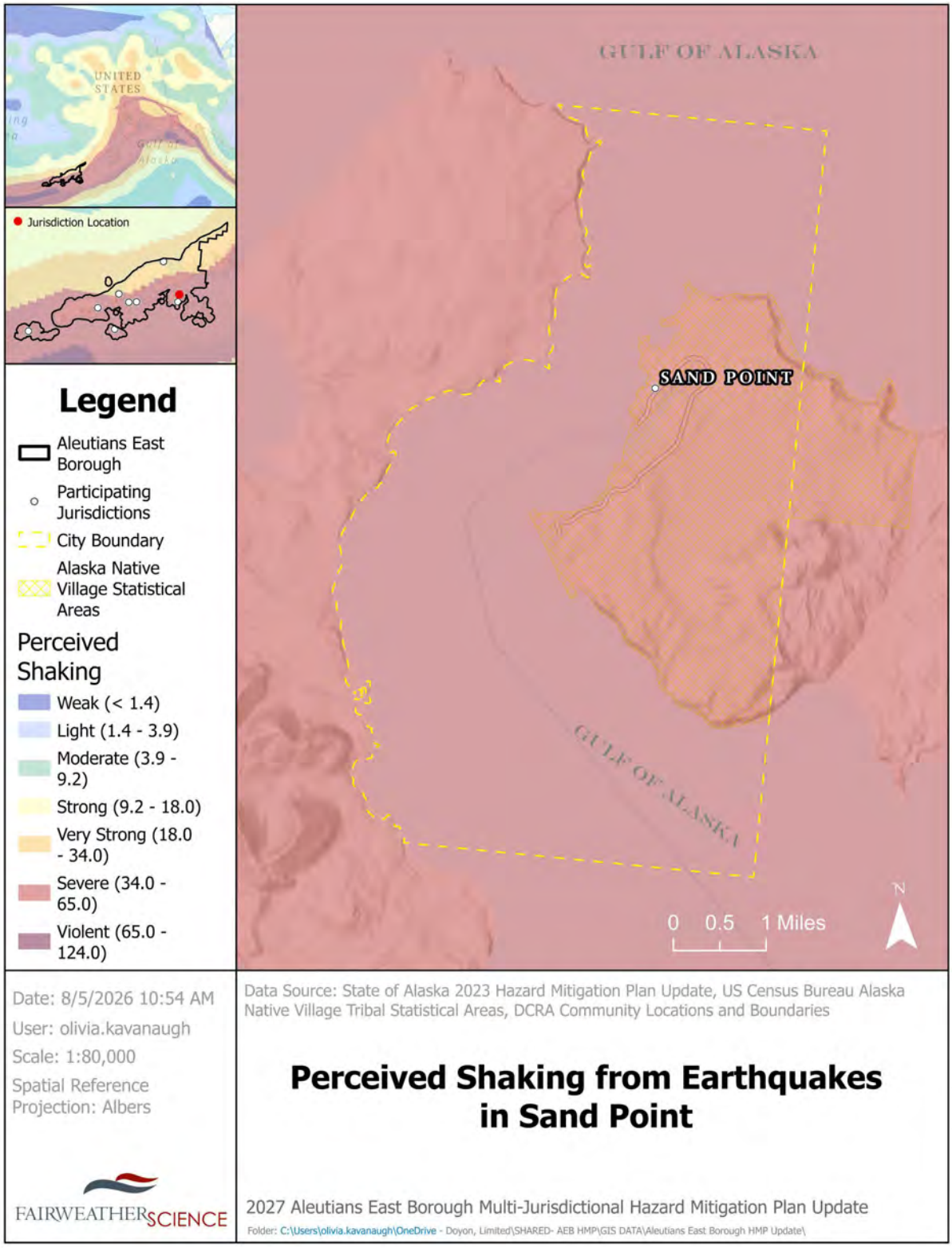



**Figure L-5 - Perceived Shaking from Earthquakes in Sand Point**

#### L.4.1.4.2 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including Pauloff Harbor and Sand Point can be found in Table 11 of the Base Plan.

#### L.4.1.4.3 Extent (Magnitude and Severity)

Thousands of earthquakes occur each year along the Aleutian chain. Strong shaking has occurred historically in Pauloff Harbor and Sand Point that can damage infrastructure and trigger tsunamis.

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding Pauloff Harbor and Sand Point experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Based on the extent of past earthquakes events and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in Pauloff Harbor is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

Based on the extent of past earthquakes events and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in Sand Point is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### L.4.1.4.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | There have been no recorded earthquake impacts on the geography or land in Pauloff Harbor and in Sand Point. An earthquake has the potential to trigger landslides, open cracks in the earth, and change the shoreline. |
| Infrastructure | While shaking has been perceived in Pauloff Harbor and Sand Point, no reports of damage to buildings have been reported. A large earthquake could crack foundations and roadways and flatten buildings and other structures in the case of extremely severe earthquakes.<br>The Planning Team reported that a building previously planned for restoration on Sanak Island collapsed during the 2022 earthquake. |
| People | No injuries or fatalities due to earthquakes have been reported in Pauloff Harbor or Sand Point. Injuries or fatalities are possible due to falling debris. |
| Utilities | There are no recorded impacts on utility systems due to earthquakes in Pauloff Harbor or Sand Point. Earthquakes can damage sewer and water lines, and down telephone poles. |
| Transportation | There is no recorded transportation system impacts due to earthquakes in Pauloff Harbor and Sand Point. In the future, earthquakes could damage roadways or airport runways, limit road and air travel, or cause a tsunami that could damage boat harbors and other water travel infrastructure. |
| Economy | There are no recorded economic impacts due to earthquakes in Pauloff Harbor or Sand Point. |

| | Description of Impacts |
|---|---|
| Subsistence Resources | There is no recorded earthquake caused impacts on subsistence resources in Pauloff Harbor and Sand Point. |

#### L.4.1.4.5 Probability of Future Events

Pauloff Harbor and Sand Point are located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing the Tribe.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Pauloff Harbor will experience an earthquake of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Sand Point will experience an earthquake of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### L.4.1.4.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | The characteristics and nature of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales. |
| Location | The location of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales. |
| Extent | The extent of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales. |
| Impact | The impact of earthquakes are not affected by changing climate conditions and are not expected to change on human timescales. |
| Probability of Future Events | The probability of future earthquake events is not affected by changing climate conditions and is not expected to change on human timescales. |
| Population Patterns | Because changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, population patterns in Pauloff Harbor and Sand Point are not expected to be affected. |
| Land Use | Because changing climate conditions are not expected to alter nature, location, extent, impact, or recurrence probability of earthquakes, land use in the Sand Point or other Pauloff Harbor not expected to be affected. |
| Subsistence Resources | Because changing climate conditions are not expected to alter the nature, location, extent, impact, or recurrence probability of earthquakes, subsistence resources in Pauloff Harbor and in Sand Point are not expected to be affected. |

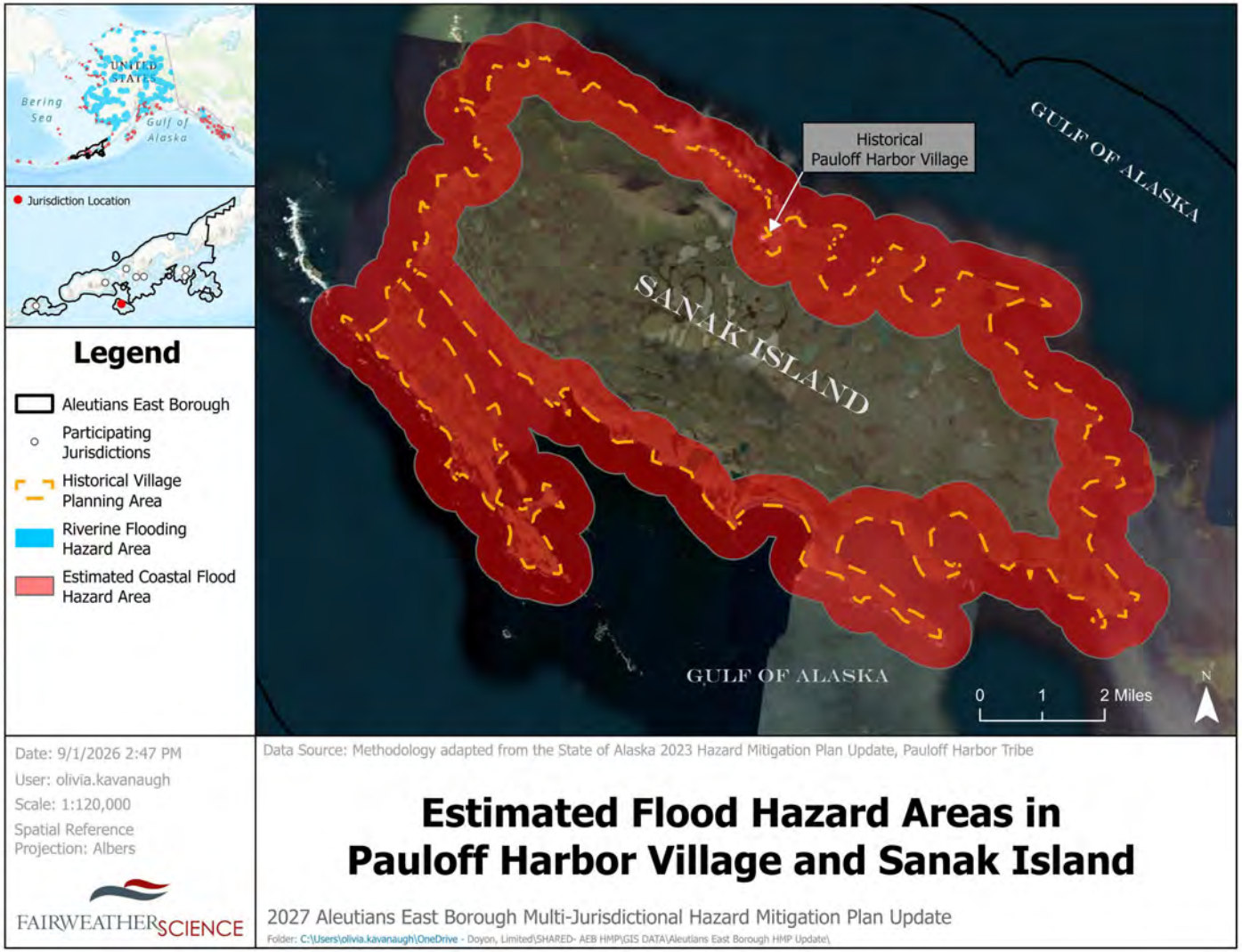
### L.4.1.5 Flood

#### L.4.1.5.1 Location

The Planning Team reported storm surge and king tide flooding impacts in coastal areas, especially at the Sand Point Harbor and boat haul-out area. They reported localized ponding due to snowmelt flooding. Generally, coastal and low-lying areas are most vulnerable to flooding events.

Sand Point has minor flooding impacts from rainfall, snowmelt run-off, and storms. Water collects in low terrain depressions and may rise to juts below a structure's first step with no water intrusion on the first floor.

Sand Point and Pauloff Harbor are in coastal flood hazard areas, as defined by estimating areas within a 0.5-mile buffer of the coast. This is the methodology used by the State of Alaska in the 2023 HMP.




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure L-6- Estimated Flood Hazard Areas in Pauloff Harbor Village and Sanak Island**

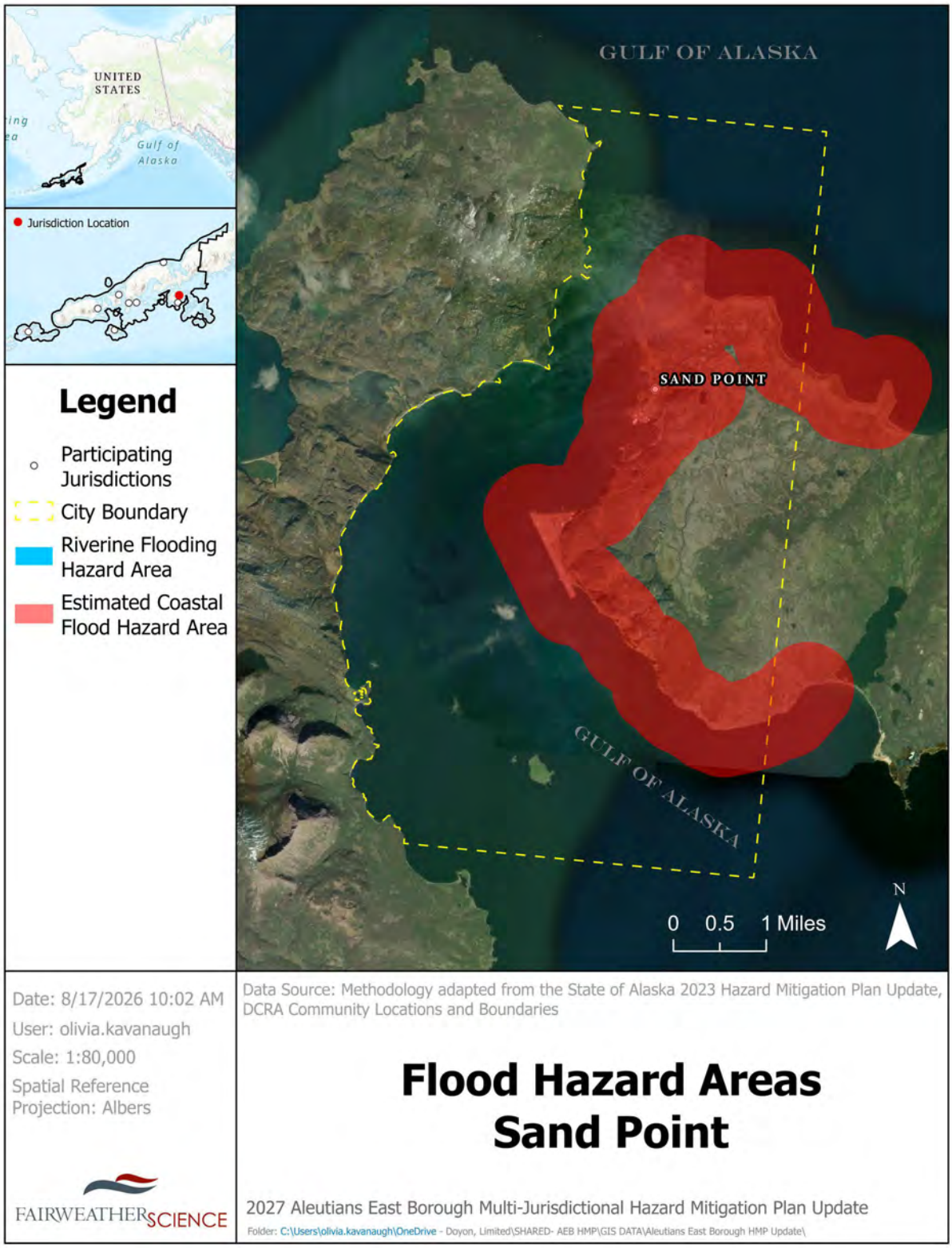



**Figure L-7- Sand Point Flood Hazard Areas**

#### L.4.1.5.2 History

MHHW represents the average height of the highest daily tide over a long observation period. Coastal flooding is likely when water levels exceed MHHW because it indicates that water has risen above the normal high tide line.

Historic high water level extremes above MHHW which exceeded the 10% annual exceedance probability are shown for Sand Point in the table below. Figure L-9 offers more context for this data.

**Table L-1- Historic Extremes Which Exceeded the 10% Annual Exceedance Probability Levels, Nov 1972 – June 2026**

| Date | Meters above MHHW | Feet above MHHW |
|---|---|---|
| **12/31/1986** | 1.33 | 4 |
| **11/5/2002** | 1.17 | 3.8 |
| **12/22/2022** | 1.41 | 4.6 |
| **1/22/2023** | 1.24 | 4.1 |

Source: NOAA/NOS/Center for Operational Oceanographic Projects and Services 2026

No historic flooding events were reported in Pauloff Harbor Village on Sanak Island by the Planning Team.

#### L.4.1.5.3 Extent (Magnitude and Severity)

The Alaska DGGS Coastal Hazards Program reported that flood extent data is unavailable for the Aleutians East Borough at this time.

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest has the lowest vulnerability.

Sand Point received a Flood Threat Ranking of 59 out of 63 (Denali Commission 2019). While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking.

NOAA maintains a meteorological station in Sand Point, which was established in September 1972. This station includes wind, air temperature, water temperature, barometric pressure, tsunami WL and microwave ML sensors.

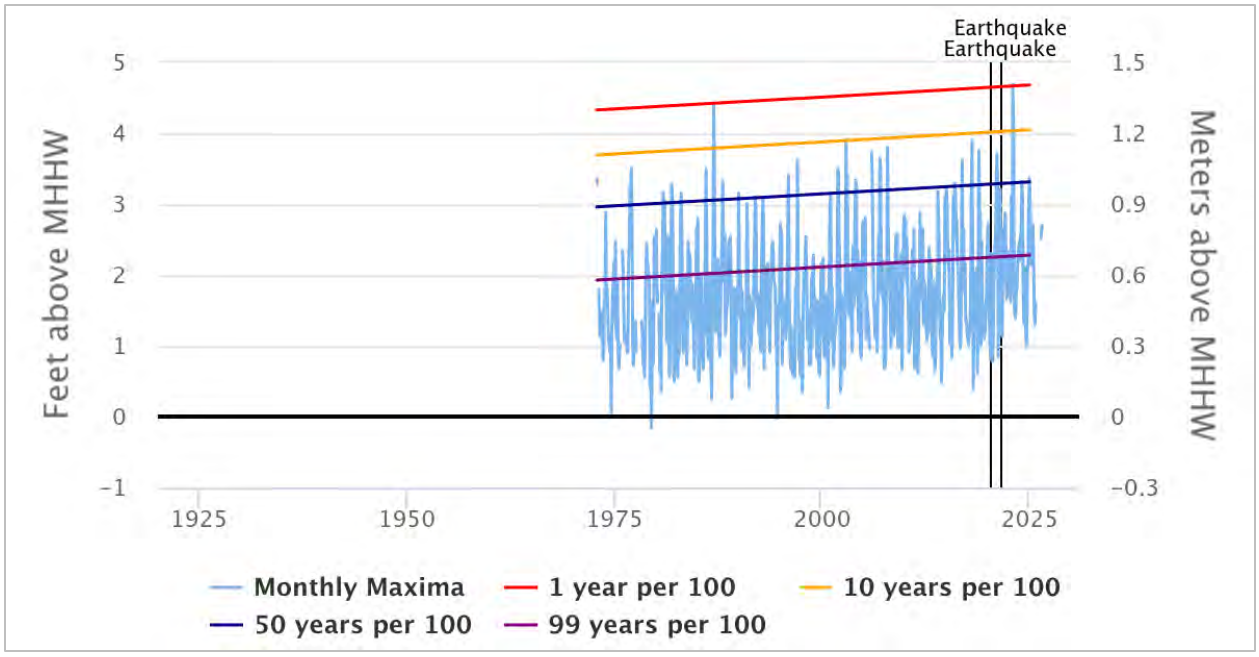


Source: NOAA 2026

**Figure L-8- Station 9459450 in Sand Point**

Figure L-9 shows monthly highest and lowest water levels, in meters above and below Mean Higher High Water (MHHW). **This data shows that December 2022 had the highest monthly water level above MHHW at 1.41 meters (4.6 feet) in the period from June 1973 to June 2026.**

The lines indicate annual exceedance probability levels. The purple line indicates a very common low water level with a high exceedance probability of 99 years per 100. The red line indicates a very rare high-water level that is only reached 1% of the time – 1 year in 100.




Source: NOAA/NOS/Center for Operational Oceanographic Projects and Services

**Figure L-9- Extreme Water Levels for Sand Point, Alaska (9459450)**

According to this NOAA data source, "the monthly extreme water levels include a Mean Sea Level (MSL) trend of 1.83 millimeters/year with a 95% confidence interval of +/- 0.8 millimeters/year which is equivalent to a change of 0.60 feet in 100 years" (NOAA 2026).

The Planning Team reported that on Sanak Island, water collected in front of the field cabin during a flooding event in 2023 or 2024. There was an estimated 4 to 6 inches of water that pooled in front of the cabin. This area is normally dry.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding in Pauloff Harbor Village on Sanak Island is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding in Sand Point is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

### L.4.1.5.4 Previous Impacts

| | Description of Previous Impacts |
|---|---|
| Geography/Land | Flooding can cause land destabilization, sediment transport and scouring of stream banks and coastal embankments, roadway embankments, foundations, footings for bridge piers, and other features.<br>**No documented historical flooding events were identified/reported for Pauloff Harbor Village. In Sand Point, previous impacts include beach erosion.** |
| Infrastructure | Floodwater can cause damage to critical facilities, structures, roads, culverts, and other features from high-velocity flow and debris carried by floodwaters. Such debris may also accumulate in culverts, increasing loads on these features or causing overtopping or backwater damage. |

| | Description of Previous Impacts |
|---|---|
| | Water inundation causes tremendous damage to homes and structures. Building materials become saturated with water and can swell, making doors and windows inoperable. Water-saturated building materials become much heavier than they would normally be, which can cause structural damage such as buckling and settling. Materials such as sheet rock can suck up water and lift it with a capillary-type action far above the original level of the flood water.<br>**The Planning Team reported flood-related damage in coastal areas, such as the Sand Point Harbor.**<br>**No documented historical flooding events were identified/reported for Pauloff Harbor Village.** |
| People | The Planning Team did not report specific instances of personal injury or death related to flooding in Pauloff Harbor or Sand Point. |
| Utilities | The Planning Team did not report any additional specific previous impacts to utilities related to flooding in Pauloff Harbor or Sand Point. |
| Transportation | Flood events can severely impact transportation systems by overtopping and inundating roadways, airstrips, marine transport infrastructure, and damaging vehicles, boats, ATVs, and other transportation methods. Low lying areas that become inundated can isolate certain parts of a community, impeding movement of people and emergency supplies.<br>**The Planning Team reported that strong fall and winter storms produce high surf, wave overtopping, beach erosion, and hazardous marine conditions that delay transportation. High tides flood the Sand Point Harbor Road and boat haul-out area. Rainfall run-off has caused trail damage.** |
| Economy | Flood events can result in economic losses through business and government facility closure, communications, utility (such as water and sewer), and transportation service disruptions. Floods can result in large expenditures for emergency response and generally disrupt the normal function of a community.<br>**The Planning Team did not report specific previous economic impacts related to flooding in Pauloff Harbor or Sand Point.** |
| Subsistence Resources | Flood events can impact landforms and ecosystems, potentially disrupting key subsistence species and access to subsistence areas. For example, deposition is the accumulation of soil, silt, and other particles on a river bottom or delta. Deposition can lead to the destruction of fish habitat and present a challenge for navigational purposes. Deposition also reduces channel capacity, resulting in increased flooding or land destabilization. River land destabilization and deposition together often lead to lateral stream movement.<br>**The Planning Team did not report any additional specific previous flooding impacts to subsistence resources in Pauloff Harbor or Sand Point, although the above transportation impacts may impact access to subsistence areas**. |

### L.4.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Pauloff Harbor Village on Sanak Island will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Sand Point will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

### L.4.1.5.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in the Planning Area as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. As a regional trend, sea ice continues to decline in the Bering Sea, and it is possible that stronger storms will bring coastal flooding to locations not previously inundated. However, this is not likely to specifically impact Sand Point and Sanak Island, as these are not located on the Bering Sea side of the Aleutian Chain. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in the Planning Area is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in the Planning Area, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in the Planning Area. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021). |

| Description of Future Conditions | |
|---|---|
| Population Patterns | It is possible that future flood events will cause changes in population patterns in the Planning Area as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### L.4.1.6 Ground Failure/Landslide

#### L.4.1.6.1 Location

Pauloff Harbor and Sand Point are prone to landslides due to their steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity.

Many landslide paths coincide with avalanche paths, especially at higher elevations. Unmapped areas within the Borough remain to be studied for landslide hazards and will be included in future updates of this plan as resources become available to evaluate those areas for landslide hazards. For specific mitigation actions, see Section 6.

There is no landslide mapping data available for Sanak Island. The Pauloff Harbor planning team reported the Southwest coast of Sanak Island has experienced landslides in the past. The extent and probability of landslides on Sanak Island is based on the lack of historical data and similar terrain to nearby jurisdictions.

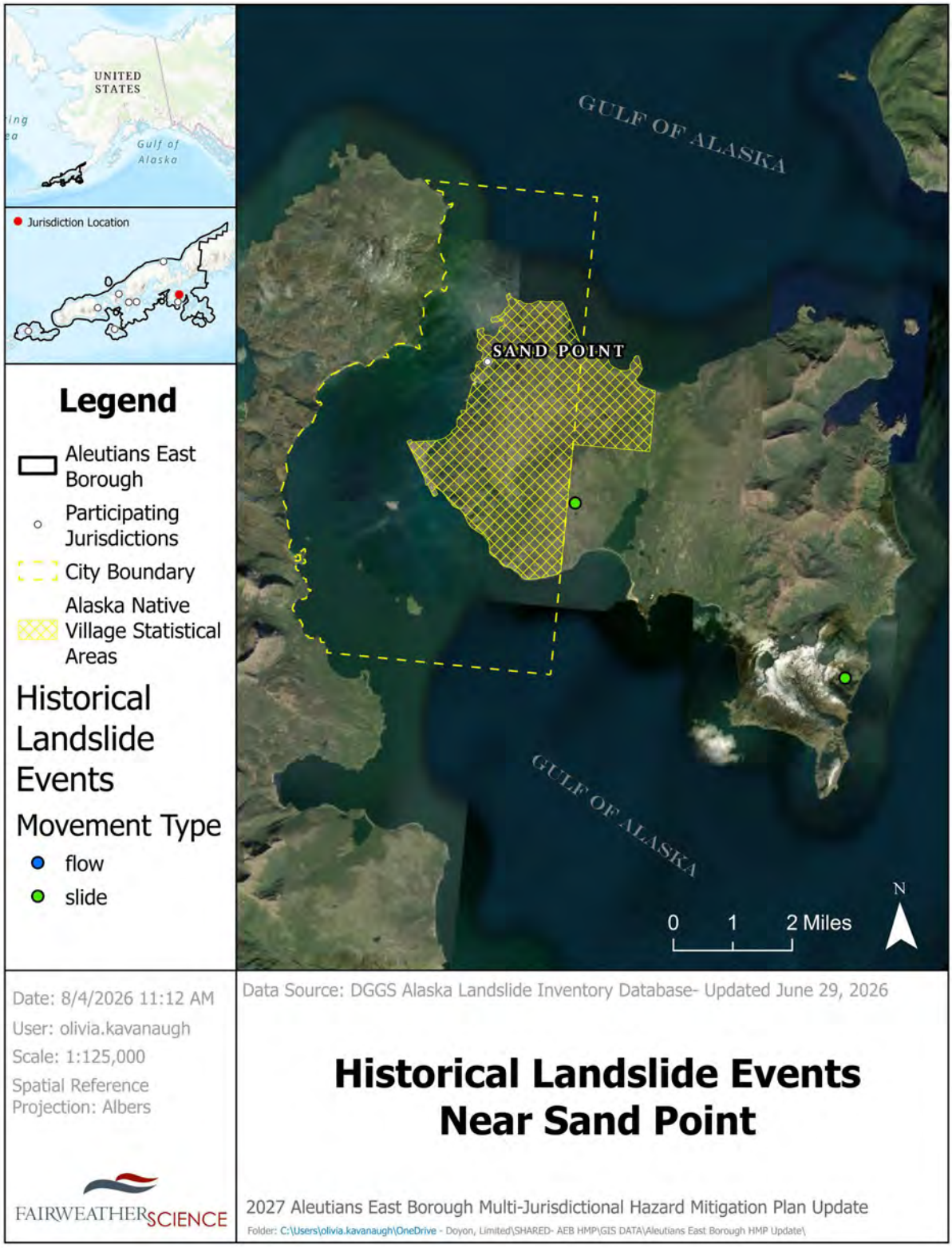



**Figure L-10 - Historic Landslide Events Near Sand Point**

#### L.4.1.6.2 History

There has been one (1) recorded subaerial landslides near Sand Point. The Alaska Landslide Inventory Database does not have any additional information available about the landslide, other than it is classified as a landslide and not a debris flow.

There is no available data for landslides in Pauloff Harbor.

The Pauloff Harbor planning team provided anecdotal reporting of several landslides on the Southwest coast of Sanak Island.

The April 1st, 1946, earthquake near Unimak Island (approximately 42 m east of Akutan, 35 miles west of Cold Bay and 45 miles east of King Cove) created a tsunami wave that reached all the way to Antarctica. For years, speculation existed that the large tsunami was aided by a submarine landslide due to the disproportionate waves created by the earthquake. In 1996, the USGS GLORIA discovered numerous slope failures (historic submarine landslides) along the eastern Aleutian Shelf. An exceptionally large failure was found at the location of the now named Ugamak Slide (Fryer, Watts, Patson 2004). The Ugamak Slide consists of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

If the Ugamak Slide did indeed occur on April 1st, 1946, it is likely that much of the seismic motion, especially at longer periods, was from the slide itself. A tectonic shock – a shallow subduction earthquake – was probably the trigger but differentiating it from the rest of the motion may prove impossible. The evidence for a landslide source to the 1946 tsunami is substantial (Fryer, Watts, Patson 2004).

#### L.4.1.6.3 Extent (Magnitude and Severity)

Damage from ground failure or landslides ranges from minor with minimal repairs required to a massive economic impact with the possible destruction of critical community infrastructure and potential loss of human life.

Subaerial landslides on sloped terrain in Sand Point pose a threat to critical facilities or human life. Subaerial landslides near bodies of water also pose a threat to critical facilities or human life in the Planning Area as they may trigger a tsunami or seiche.

Based on the Alaska Landslide Inventory Database, it can be estimated that the historical landslides recorded in Sand Point range in width of less than 100 feet to over 500 feet.

According to the Pauloff Harbor planning team, there have been several landslides on the Southwest coast of Sanak Island, approximately 15 feet in width.

A landslide (both submarine and subaerial) could trigger a tsunami. Due to Sand Point's location near the Pacific Ocean, and exposure to the open ocean, a submarine landslide-induced tsunami affecting the Planning Area in the future is a possibility. In the past, a submarine landslide created secondary hazards (tsunamis), that have impacted Sand Point or Pauloff Harbor.

The largest discovered underwater landslide deposit in the Aleutians East Borough is the Ugamak Submarine Slide. The Ugamak Submarine Slide consisted of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

Based on the recorded extent of past landslide events and the criteria identified in Table 5 of the Base Plan, the extent of landslides in Pauloff Harbor is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

The potential extent was determined by assessing authoritative State and Federal landslide history sources and concluding that if there was a large frequency or magnitude of landslides in the area, a record would exist of these events. Since there is very little record of landslides in Pauloff Harbor, it is assumed the extent is not rated as Critical or Catastrophic. This rating could be changed in the future if the lack of landslide record is a data gap, and not due to a lack of landslide extent.

#### L.4.1.6.4 Impact

| Description of Impacts | |
|---|---|
| Geography/Land | One recorded landslide has impacted near Sand Point; however, it was not near any critical facilities. There are no recorded landslides near Pauloff Harbor. Future landslides could damage steep hillsides, making them more prone to land destabilization, avalanches, and further landslides. |
| Infrastructure | There has not been any recorded impact on infrastructure in Pauloff Harbor and in Sand Point. Landslides can move structures off their foundation, damage walls and roofs, and cover or damage roadways and airport runways. |
| People | There have been no recorded injuries or fatalities due to landslides in Pauloff Harbor or Sand Point. Landslides can injure or kill people due to debris and soil flowing or burying people. |
| Utilities | There have been no recorded landslide impacts on utilities in Pauloff Harbor or Sand Point. Landslides could damage sewer, water, and utility lines by moving earth downhill. |
| Transportation | There have been no recorded landslide impacts on transportation systems in Pauloff Harbor or Sand Point. Road and air travel could be halted or delayed due to landslides damaging or covering the infrastructure. A submarine landslide could create a tsunami or seiche that damages boat harbors or other marine infrastructure, limiting water travel. |
| Economy | There are no recorded economic impacts due to landslides in Pauloff Harbor or Sand Point. |
| Subsistence Resources | There have been no recorded landslide impacts to subsistence resources in Pauloff Harbor or Sand Point. |

#### L.4.1.6.5 Probability of Future Events

Based on the lack of recorded previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Pauloff Harbor will experience a landslide event in the next 5 years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### L.4.1.6.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of landslides in Pauloff Harbor or Sand Point in the future. |
| Location | It is possible that future climate conditions will influence the location of future landslides in Pauloff Harbor or Sand Point. Landslide probability is location specific, and numerous variables must be considered. It is common for debris flows to recur in the same channel or to shift slightly. Other types of landslides may reoccur in the same place or the area directly adjacent to a previous landslide. Pauloff Harbor and Sand Point is located in a highly seismic area, which can trigger landslides at any time, and create areas prone to landslides that did not used to be. |

| Description of Future Conditions | |
|---|---|
| | Ground failures related to more frequent severe weather events, an increase in atmospheric rivers, and potential droughts are expected to appear in locations that were previously frozen and are now thawing. This includes areas that are immediately adjacent to recently thawed ground and where overlying vegetation has been removed. However, landslides also occur in areas with no prior known instabilities due to changing conditions such as increased rainfall, strong earthquake shaking, and human activities (DHS&EM 2023). |
| Extent (Magnitude and Severity) | It is likely that future climate conditions will influence the magnitude of future landslides in Pauloff Harbor and Sand Point. Landslides are expected to increase in magnitude with increased areas of effect as severe weather events increase in frequency (IPCC 2019).<br>Future climate conditions are expected to increase landslide frequency of all intensities, and as people develop across the landscape, including into hazardous areas, there will likely be an increase in more significant outcomes in the future (DHS&EM 2023). |
| Impact | It is likely that future climate conditions will influence the impact of future landslides in Pauloff Harbor and Sand Point. Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from an increase in atmospheric rivers, severe weather events, and glacial decline (IPCC 2019), which could increase future ground failure events and resultant impacts. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of future landslides in Pauloff Harbor and Sand Point. Although the probability of ground failure is location-specific, it is likely, and increasing, due to a changing climate. Severe weather events such as precipitation and wind are a direct result of atmospheric warming. Atmospheric rivers are becoming increasingly common and increase the intensity and duration of precipitation events at regional and local scales. Landslide events are directly related to high intensity precipitation events, and those are likely to become more common over greater geographic regions of Alaska (DHS&EM 2023). |
| Population Patterns | It is possible that future climate conditions will influence population patterns in Pauloff Harbor and Sand Point. Eventually, more of the resident population could be living in landslide hazard areas, and an increased growing season due to future climate conditions could lengthen the tourist season. An increase in seasonal workers and tourists throughout the year could possibly increase the number of people that are at risk of landslide hazards at any given moment. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Pauloff Harbor and Sand Point. Limiting development and relocating existing development outside of landslide hazard areas would change the development in these areas. A landslide warning system could require infrastructure development, and more development outside of the landslide zones could increase land use to accommodate displaced residents. It is also possible that land developed in the future, or that has already been developed, may eventually become prone to landslide hazards. |
| Subsistence Resources | It is possible that future climate conditions will result in landslides impacting subsistence resources. Landslides could wipe out land access to certain parts of coastline, berry gathering locations, or trails leading to hunting or fishing grounds. |

### L.4.1.7 Invasive Species

#### L.4.1.7.1 Location

The entire natural area surrounding Pauloff Harbor Village/Sanak Island are Sand Point is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. Sand Point's location adjacent to a busy coastal port is a possible human-caused pathway in the spread of invasive species in the community. Invasive plant seeds can be transported unintentionally on vessels and cargo, potentially allowing species introduced near developed areas to spread into natural areas.

On Sanak Island and nearby Caton Island, two species of an invasive terrestrial plants have been documented, including:

- Common dandelion (Sanak Island)
- Common sheep sorrel (Caton Island)

Figure L-11 depicts the locations of documented invasive terrestrial plant species on Sanak Island and Caton Island, as reported by community members in the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database.

While there are no documented occurrences of invasive plants in Sand Point according to the AKEPIC database, this absence of records may be attributed to limited sampling and survey efforts in the area rather than an absence of invasive species.

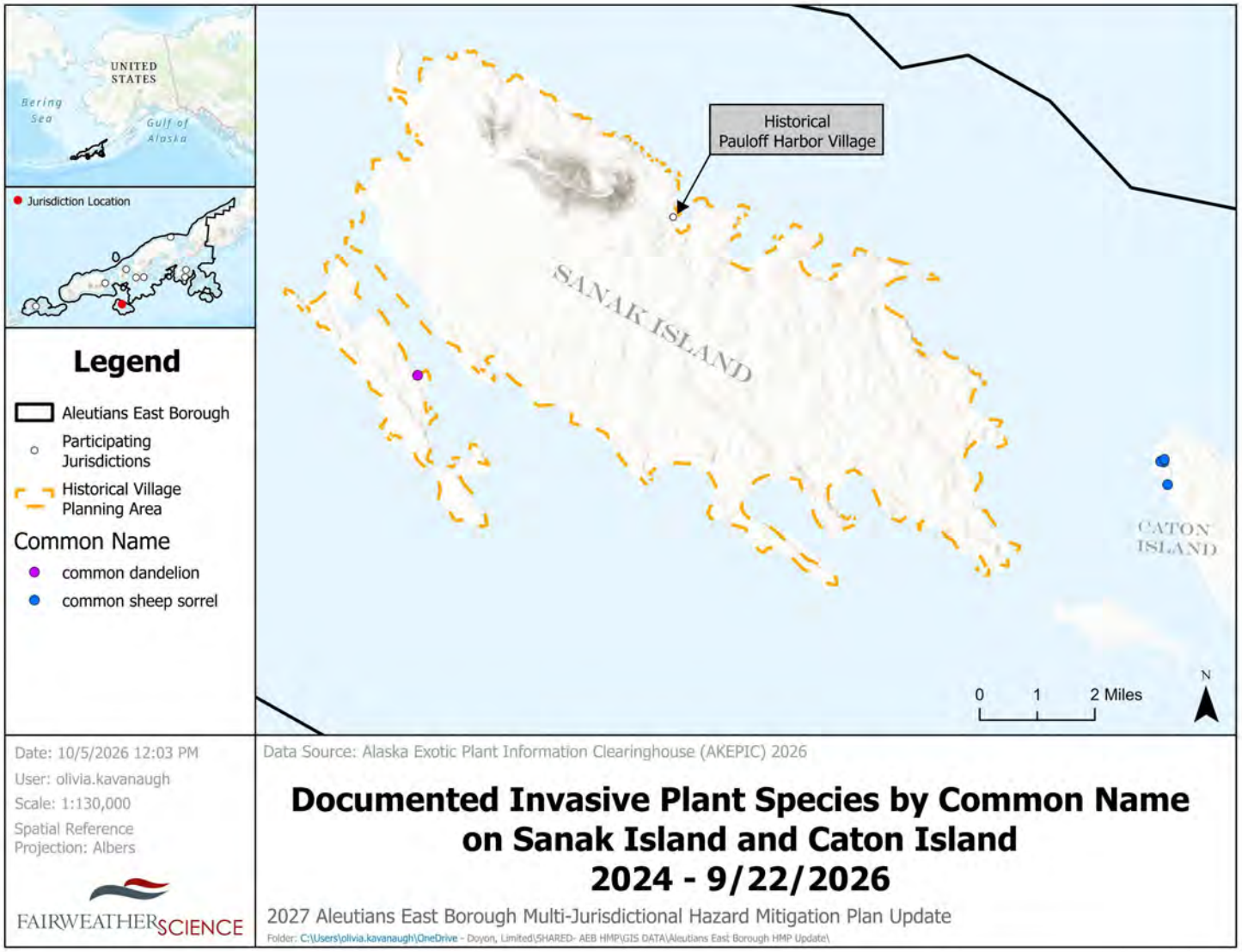



**Figure L-11- Documented Invasive Plant Species by Common Name on Sanak Island and Caton Island**

#### L.4.1.7.2 History

While invasive species data for Pauloff Harbor Village/Sanak Island is limited, there are reported infestations of Common Dandelion and Common Sheep Sorrel on nearby Caton Island.

Sand Point has had historical vessel traffic related to the fishing and shipping industry, which can contribute to the spread of invasive species in the region. While there have been no historical occurrences of invasive rat populations or invasive aquatic animals in the community, Sand Point has had a reported invasive plant occurrence, which was identified as the highly invasive Orange Hawkweed (USFWS 2026). While there are no documented occurrences of invasive plants in Sand Point according to the AKEPIC database, this absence of records may be attributed to limited sampling and survey efforts in the area rather than an absence of invasive species.

#### L.4.1.7.3 Extent (Magnitude and Severity)

While the threat of an invasive species event in Pauloff Harbor Village/Sanak Island or Sand Point remains high, previous occurrences and knowledge of the magnitude and severity are currently limited.

Table L-2 displays the non-native plant occurrences that have occurred on Sanak Island and Caton Island. A total of 2 acres on Sanak Island has been infested by the common dandelion and 0.1 acres on Caton Island have been infested by the common sheep sorrel.

**Table L-2- Non-Native Plants on Sanak Island and Caton Island**

| Invasive Plant Species | Total Infested Area (acres) | Invasiveness Ranking (0-100) |
|---|---|---|
| **Common Dandelion** | 2.063 | 58 |
| **Common Sheep Sorrel** | 0.103 | 51 |
| **Total** | **2.166 acres** | **Maximum Ranking: 58** |

**While invasive species are a concern for many communities, at this time, the presence of these species is not impacting critical facilities.**

Based on the lack of invasive species data and the criteria identified in Table 5 of the Base Plan, the historical extent to Pauloff Harbor Village from invasive species are considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past invasive species events and the criteria identified in Table 5 of the Base Plan, the magnitude and severity to Sand Point from invasive species are considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### L.4.1.7.4 Previous Impacts

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The primary impact of invasive species on the land surrounding Pauloff Harbor Village or Sand Point has been localized non-native plant infestations, which can outcompete native plants and wildlife. |
| Infrastructure | There is limited evidence that invasive species have directly impacted infrastructure in Pauloff Harbor Village or Sand Point. |
| People | While invasive species can affect resources that people depend on, Pauloff Harbor Village or Sand Point has no history of invasive species directly affecting the residents of the community. |
| Utilities | There have been no documented cases of invasive species causing utility disruptions in Pauloff Harbor Village or Sand Point. |

| | Description of Previous Impacts |
|---|---|
| Transportation | Transportation is identified as a potential pathway for invasive species to spread throughout Pauloff Harbor Village or Sand Point. Due to the nature of invasive species in the community, there is little evidence to show that these species cause direct damage to transportation infrastructure in Pauloff Harbor Village or Sand Point. |
| Economy | There have been no reports of an invasive species infestation resulting in significant economic impacts in Pauloff Harbor Village or Sand Point. |
| Subsistence Resources | Invasive species pose a potential threat to subsistence resources in Pauloff Harbor Village or Sand Point, primarily related to the threat of non-native plants outcompeting native plants that residents rely on for subsistence activities. |

#### L.4.1.7.5 Probability of Future Events

Based on previous occurrences, and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Pauloff Harbor Village will experience an invasive species event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

While there are no recorded invasive species occurrences on Sanak Island, the aggressive nature of invasive plants and Sanak Island's proximity to nearby areas with documented invasive species occurrences indicate that invasive species could occur on the island.

Based on previous occurrences, and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Sand Point will experience an invasive species event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### L.4.1.7.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | It is possible future climate conditions will influence the nature of invasive species in Pauloff Harbor Village or Sand Point. Warmer temperatures and longer growing seasons may allow some invasive species to become established in areas where they don't historically occur. |
| Location | It is likely future climate conditions will influence the location of invasive species in Pauloff Harbor Village or Sand Point. Changes in temperature and precipitation patterns may allow invasive species to expand into new terrestrial and marine areas of Pauloff Harbor Village or Sand Point. |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of invasive species in Pauloff Harbor Village or Sand Point. Future changes may create favorable conditions for certain invasive species, allowing populations to spread at a rapid rate. |
| Impact | It is likely future climate conditions will influence the impacts of invasive species in Pauloff Harbor Village or Sand Point. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of invasive species in Pauloff Harbor Village or Sand Point. As environmental conditions change, areas that were previously unsuitable for certain invasive species may become more favorable for establishment and spread, which increases the probability of future events in Pauloff Harbor Village or Sand Point. |

| Description of Future Conditions | |
|---|---|
| Population Patterns | It is possible future climate conditions will influence population patterns in Pauloff Harbor Village or Sand Point. Changes in the distribution and abundance of invasive species may alter the availability of food and habitat relied upon by wildlife and residents of Sand Point. |
| Land Use Development | It is unlikely future climate conditions will influence future land use development in Pauloff Harbor Village or Sand Point. |
| Subsistence Resources | It is likely future climate conditions will influence subsistence resources in Pauloff Harbor Village or Sand Point. Changes in ocean conditions, weather patterns, and species distribution may affect the availability and accessibility of important subsistence resources. The introduction or expansion of invasive species could further impact native species that support subsistence activities in Pauloff Harbor Village or Sand Point. |

### L.4.1.8 Sediment Deterioration and Land Destabilization

#### L.4.1.8.1 Location

Sediment deterioration and land destabilization can occur throughout Pauloff Harbor Village or Sand Point, with coastal and riverine land destabilization being the biggest concerns for the community. Since Pauloff Harbor Village and Sand Point are classified as coastal areas, they are susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surges, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.

Riverine sediment deterioration and land destabilization occurs throughout several drainages in Sand Point due to heavy rainfall.

Ongoing coastal erosion is reported at multiple Sanak Island sites by the Pauloff Harbor Tribe Planning Team, including Pauloff Harbor, Northeast Harbor, Johnson's, Unimak Cove, and the Sandy/Pederson Bay dune area.

While the extent of sediment deterioration and land destabilization in Sand Point varies by location, many facilities like the airport may be increasingly vulnerable to future destabilization.

#### L.4.1.8.2 History

The history of coastal and riverine sediment deterioration and land destabilization in Sand Point varies by location due to the localized nature of storms in the community. According to a Pauloff Harbor Tribe Planning Team member, multiple Sanak Island sites experience ongoing coastal land destabilization, which has damaged portions of the historic trail.

Community oral history provided by the Pauloff Harbor Tribe also documents long-term landscape change near the Ikatan village area. The Tribe reports that a small boat could formerly navigate at high tide between Ikatan Bay and Otter Cove, while the former channel has subsequently filled with sediment and is now land. The observation documents a change in local navigation and access but does not establish the cause of the change.

#### L.4.1.8.3 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of sediment deterioration and land destabilization vary throughout select communities. In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk. Sand Point was categorized in erosion Group 3, which places it at a lower risk of sediment deterioration and land destabilization according to the study.

According to the Pauloff Harbor Tribe Planning Team, coastal sediment deterioration and land destabilization continues to threaten cultural resources, beaches, dunes, and shoreline access. Riverine sediment deterioration and land destabilization is also identified as continuing to impact stream banks in Sand Point, which contributes heavily to bank instability.

On Sanak Island, the Planning Team reported up to 10 feet of shoreline loss per year. They identified an area of significant erosion near the beach, where a trail was lost to shoreline loss. The Planning Team reported that it was "like someone took a knife and cut it (the shoreline)".

Based on the historical extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the extent of sediment deterioration and land destabilization in Pauloff Harbor Village is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the extent of sediment deterioration and land destabilization in Sand Point is

considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### L.4.1.8.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding Pauloff Harbor Village or Sand Point has been damages to shoreline and beaches, particularly along areas exposed to waves and storms. In the community, impacts from destabilization has been documented along the beaches in Sand Point.<br>On Sanak Island, the Planning Team reported shoreline loss including a beach access trail. |
| Infrastructure | Besides the historic destabilization near the Sand Point airport, impacts to infrastructure from sediment deterioration and land destabilization in Pauloff Harbor Village or Sand Point have been historically limited. Future land destabilization could threaten additional community infrastructure and increase mitigation costs. |
| People | Sediment deterioration and land destabilization can affect residents and visitors of Pauloff Harbor Village or Sand Point by threatening homes and access to subsistence areas. The Planning Team reported that on Sanak Island, a beach access trail was lost, impacting residents who use the trail for subsistence and other activities. |
| Utilities | There have been no documented impacts to the utilities in Sand Point from sediment deterioration and land destabilization events. There are no utilities in Pauloff Harbor Village that can be impacted by sediment deterioration and land destabilization events. |
| Transportation | The primary transportation related impacts from a sediment deterioration and land destabilization event in Sand Point are damage to roads, boardwalks, and other transportation infrastructure. One trail access point on Sanak Island was lost to shoreline loss, as reported by the Planning Team. |
| Economy | There are a substantial number of roads in Sand Point that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities. There are no recorded economic impacts in Pauloff Harbor Village from sediment deterioration and land destabilization events. |
| Subsistence Resources | A primary concern related to subsistence resources in Pauloff Harbor Village or Sand Point is the loss of subsistence fish camps that have been used for generations, which have the potential to be washed-out or the access restricted during a storm. Another concern is the ongoing destabilization at the Sanak Island sites that are used for subsistence activities. One beach access trail was lost to shoreline loss, as reported by the Planning Team. |

#### L.4.1.8.5 Probability of Future Events

The coastal geography influences the likelihood of continued sediment deterioration and land destabilization in Pauloff Harbor Village and Sand Point.

Based on previous occurrences, ongoing monitoring, and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Pauloff Harbor Village will experience a sediment deterioration and land destabilization event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Sand Point will experience a sediment deterioration and land destabilization event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### L.4.1.8.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in Pauloff Harbor Village or Sand Point. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in Pauloff Harbor Village or Sand Point. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal land destabilization in Pauloff Harbor Village or Sand Point (AK DGGS 2026). |
| Extent (Magnitude/Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in Pauloff Harbor Village or Sand Point. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in Pauloff Harbor Village or Sand Point. Projected increases in precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in Pauloff Harbor Village or Sand Point. Although the probability for land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Pauloff Harbor Village or Sand Point. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of Sand Point entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Pauloff Harbor Village or Sand Point. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in Pauloff Harbor Village or Sand Point. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

### L.4.1.9 Severe Weather

#### L.4.1.9.1 Location

All of Pauloff Harbor Village on Sanak Island and Sand Point are vulnerable to severe weather events.

#### L.4.1.9.2 History

Sand Point has a history of high wind events and winter storms.

The Planning Team reported that the winter of 2025-2026 included “prolonged cold temperatures, affecting utilities, transportation, and outdoor work”.

#### L.4.1.9.3 Extent (Magnitude and Severity)

For the purposes of this Risk Assessment, data collected in Sand Point is used as proxy for Sanak Island.

Table L-3 shows monthly averages for maximum temperature, minimum temperature, total precipitation, average total snowfall, and snow depth from 1980 to 1994 in Sand Point.

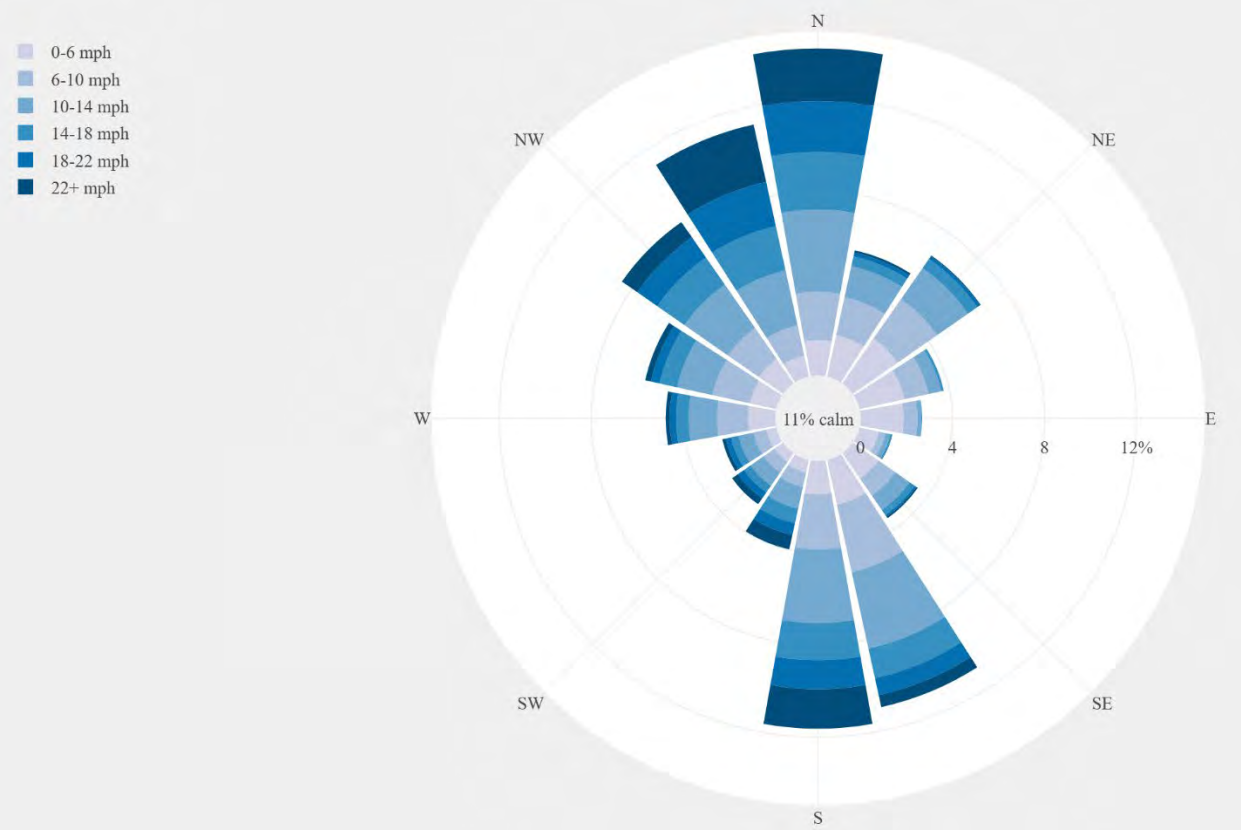
**Table L-3- Monthly Climate Summary 6/1/1980-6/30/1994, Sand Point**

| | Jan | Feb | Mar | April | May | June | July | Aug | Sept | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Avg. Max. Temp (F)** | 36.2 | 34.9 | 37.7 | 39.2 | 45.3 | 51.9 | 57.5 | 57.6 | 53.9 | 46.6 | 41.3 | 38.6 | 45.1 |
| **Avg. Min. Temp (F)** | 29.0 | 27.0 | 28.9 | 30.6 | 36.4 | 41.8 | 46.8 | 48.1 | 44.1 | 37.6 | 33.2 | 31.3 | 36.2 |
| **Avg. Total Precipitation (in.)** | 3.88 | 2.60 | 3.26 | 2.41 | 3.03 | 3.15 | 2.87 | 4.01 | 6.32 | 3.89 | 3.47 | 5.79 | 44.68 |
| **Avg. Total Snowfall (in.)** | 5.6 | 1.8 | 1.5 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 2.0 | 12.9 |
| **Avg. Snow Depth (in.)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: WRCC 2026

The Planning Team reported frequent winds exceeding 60mph in Sand Point.

Average wind speeds in Sand Point are highest in the winter months, according to the Western Regional Climate Center. Figure L-12 below illustrates average wind speeds and directions at the Sand Point Airport over the course of the year from 1980-2025, demonstrating that wind speeds do reach 22+ mph.




Source: UAF SNAP & WRCC 2025

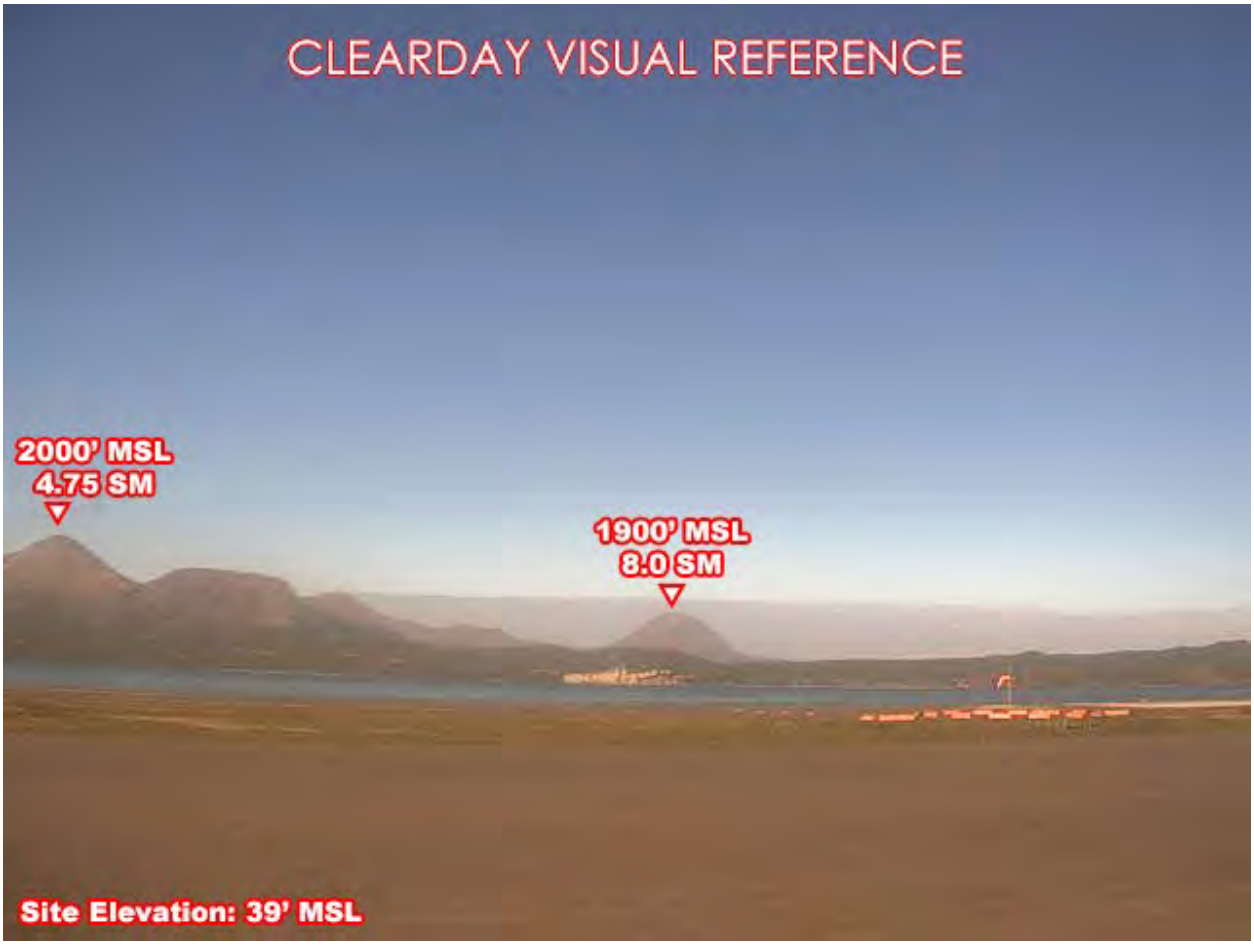
**Figure L-12- Wind Speed/Direction Distribution for Sand Point Airport, 1980-2025**

Dense fog can disrupt travel at the Sand Point Airport. The Federal Aviation Administration monitors weather cameras at the Sand Point Airport. Below are images of an overcast day and a clear day visual reference. These images are from August 13, 2026, and are intended to provide a qualitative visual reference of the impact of weather on visibility at the airport.




Source: FAA WeatherCams 2026

**Figure L-13- Sand Point Airport on 8/13/2025, Facing West**




Source: FAA WeatherCams 2026

**Figure L-14- Sand Point Airport on 8/13/2025, Facing West, Clear Day**

Data and monitoring are needed on Sanak Island to better understand severe weather extent. The closest Alaska Water Level Watch Sensor is in Zachary Bay, on Unga Island (AWLW 2026). However, the Aleutians East Borough, including Sand Point and Sanak Island, experience some of the harshest severe weather in the U.S. due to their location in the western Gulf of Alaska. This includes high winds, heavy rain, and dense fog. The Planning Team reported that Tribal members living in Sand Point visit Sanak Island from approximately May to October, due in large part to hazardous marine conditions caused by severe weather in the winter months.

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather events in Pauloff Harbor Village is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather events in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### L.4.1.9.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The Planning Team did not report any specific previous impacts from severe weather events in Sand Point or in Pauloff Harbor Village. |
| Infrastructure | According to the Planning Team, high winds have caused some property damage in Sand Point.<br>On Sanak Island, the Planning Team reported that a corridor and outhouse were damaged at the field cabin site due to a storm. The Planning Team is not sure about damages due to extreme cold on Sanak Island, as generally residents only travel there between May and October. |
| People | The Planning Team reported that extreme cold impacts outdoor work in Sand Point. The winter of 2025-2026, for example, included prolonged cold temperatures that impacted utilities, peoples' ability to get around town and out of town, and limited outdoor work.<br>The Planning Team reported that heavy fog can make it difficult to do fieldwork on Sanak Island due to low visibility. |
| Utilities | The Planning Team reported power outages due to high wind events and freezing rain/ice storm events in Sand Point. Extreme cold also impacts utilities. The Planning Team also noted that in Sand Point, powerlines become salty and result in power outages.<br>The Planning Team did not report specific previous impacts to utilities in Pauloff Harbor Village. |
| Transportation | The Planning Team reported travel delays due to high winds as well as dangerous marine conditions in Sand Point. Heavy snow also reduces visibility, closes roads, delays flights, and limits travel. Ice accumulation creates hazardous roads, walkways, and unsafe travel. Extreme cold impacts transportation.<br>The Planning Team reported that in Pauloff Harbor Village on Sanak Island, high winds, rough seas, storms, and poor visibility can delay or prevent vessel travel to and from Sanak Island, affecting transportation, supply delivery, emergency response, and access to the island. |
| Economy | The Planning Team did not report specific previous economic impacts related to severe weather in Sand Point of Pauloff Harbor Village. |
| Subsistence Resources | The Planning Team reported that severe weather and hazardous marine conditions can prevent or delay access to traditional subsistence areas on and around Sanak Island, even when the subsistence resources themselves are not damaged. |

#### L.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Pauloff Harbor Village on Sanak Island will experience a severe weather event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Sand Point will experience a severe weather event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

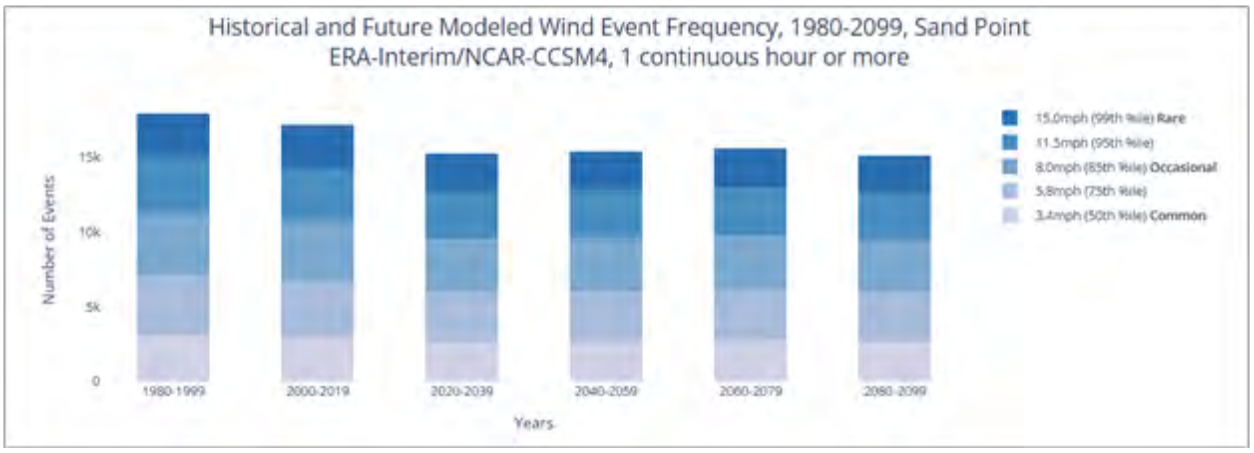
### L.4.1.9.6 Future Climate Conditions

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in Pauloff Harbor Village or Sand Point. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in Pauloff Harbor Village or Sand Point. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in Pauloff Harbor Village or Sand Point. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in Pauloff Harbor Village or Sand Point. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in Pauloff Harbor Village or Sand Point. | It is unlikely that future climate conditions will influence the nature of future high wind events in Pauloff Harbor Village or Sand Point. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in Pauloff Harbor Village or Sand Point. | It is possible that future climate conditions will influence the location of future drought/water supply events in Pauloff Harbor Village or Sand Point. | It is unlikely that future climate conditions will influence the location of future extreme cold events in Pauloff Harbor Village or Sand Point. | It is unlikely that future climate conditions will influence the location of future heavy rain events in Pauloff Harbor Village or Sand Point. | It is unlikely that future climate conditions will influence the location of future heavy snow events in Pauloff Harbor Village or Sand Point. | It is unlikely that future climate conditions will influence the location of future high wind events in Pauloff Harbor Village or Sand Point. |
| Extent | Models have a higher uncertainty with regard to precipitation, but winter is likely to have more precipitation in Pauloff Harbor (UAF/SNAP 2025). Due to a projected increase in future precipitation in Pauloff Harbor Village over the next few decades, the magnitude and severity of dense fog events in the Planning Area could increase (UAF/SNAP 2026). | In Pauloff Harbor Village, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026). Winter may transition from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). Climate change within Alaska is likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In Pauloff Harbor average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026). Winter temperatures are projected to transition from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). **Monthly average temperatures in Pauloff Harbor Village and Sand Point are projected to increase over time (UAF/SNAP 2026).** | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in the Pauloff Harbor. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP). Extreme precipitation events have occurred throughout Alaska with increasing frequency. In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>**Monthly average precipitation is projected to increase over time in Pauloff Harbor Village and Sand Point, with the largest increases in the winter months (UAF/SNAP 2026). In Pauloff Harbor, winter is likely to have more precipitation (+26%) (UAF/SNAP 2026).** | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>Pauloff Harbor Village experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months. Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP).<br>**However, UAF/SNAP modeling projects a slight decrease in the overall frequency of high wind events in Sand Point by the end of the century compared to the historical record dating back to 1980, with a relatively stable frequency of wind speeds in general in the coming decades.**<br>UAF/SNAP modeling for wind events in Pauloff Harbor Village is not available. |
| Impact | Projected increases in precipitation and associated moisture availability in Pauloff Harbor Village could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026). Reduced visibility from denser or longer-lasting fog could increase | Overall temperature trends in Pauloff Harbor Village are projected to increase, with average annual temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities | While overall temperatures in Pauloff Harbor Village are projected to increase by approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In Pauloff Harbor Village, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+26%) (UAF/SNAP 2026). | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during | High wind events are projected to increase in Alaska (NOAA 2025), however, more localized projections for Pauloff Harbor Village and Sand Point project generally stable wind frequencies into the future (UAF/SNAP 2026). Given this, it is estimated that impacts from high wind events are likely to remain as they are.<br>Impacts from high winds in Pauloff Harbor Village or Sand Point have included loss of utilities, damage to buildings |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | hazards for aviation, marine navigation, and roadway travel. | in the Aleutians East Borough (Alaska DHS&EM 2023). | | | winter could also lead to less runoff to maintain reservoir levels. The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | and residences, and transportation disruptions and delays. |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in Pauloff Harbor Village by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in Pauloff Harbor Village are projected to increase, with estimated average annual temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In Pauloff Harbor Village, models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+26%) (UAF/SNAP 2026). Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in Pauloff Harbor Village are projected to increase, with winter possibly transitioning from below freezing to above freezing in the future (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In Pauloff Harbor Village, winter is likely to have more precipitation (UAF/SNAP 2026). Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in Pauloff Harbor Village or Sand Point may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. UAF/SNAP data projects an increase in precipitation in the winter months in Pauloff Harbor Village and Sand Point (UAF/SNAP 2026). | High-wind events are projected to become more frequent in the future in Alaska (NOAA 2025). The highest increases are projected to be in the northern and western Alaska coastal regions (AK HMP 2023).<br>**However, UAF/SNAP modeling projects a slight decrease in the overall frequency of high wind events in Sand Point by the end of the century, with a relatively stable frequency of wind speeds in general.**<br>Wind projections for Pauloff Harbor Village are not available. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in Pauloff Harbor Village or Sand Point. | Future conditions of drought are not anticipated to significantly affect population patterns in Pauloff Harbor Village or Sand Point. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in Pauloff Harbor Village or Sand Point. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | In Pauloff Harbor Village models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+26%) (UAF/SNAP 2026). It is not likely that future conditions influencing heavy rain will impact changes in Pauloff Harbor Village or Sand Point population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in Pauloff Harbor Village or Sand Point population patterns. | It is not likely that future conditions influencing high winds will impact changes in Pauloff Harbor Village or Sand Point population patterns. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in Pauloff Harbor Village or Sand Point. | Future conditions of drought are not anticipated to substantially affect future land use development in Pauloff Harbor Village or Sand Point. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in Pauloff Harbor Village or Sand Point as extreme cold is a regional hazard. | As heavy rain events affect Pauloff Harbor, it is not likely that future conditions of heavy rain will impact changes in Pauloff Harbor Village or Sand Point population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in Pauloff Harbor Village or Sand Point land use development. | It is not likely that future conditions of high winds will impact changes in Pauloff Harbor Village or Sand Point land use development. . |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in Pauloff Harbor Village or Sand Point. | Future conditions of drought may affect subsistence resources in Pauloff Harbor Village or Sand Point, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity. | Future conditions of extreme cold may affect subsistence resources in Pauloff Harbor Village or Sand Point, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to | It is possible that future conditions of heavy rain will impact changes in Pauloff Harbor Village or Sand Point land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above Pauloff Harbor | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate | It is not likely that future conditions of high winds will impact changes in Pauloff Harbor Village or Sand Point subsistence activities. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users.<br>Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | Village or Sand Point leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to development of landslide monitoring equipment and/or landslide barriers/diversion structures. | regulates the local ecology. A shift toward less winter snow could alter stream flows, thermal stress, and nutrient availability for subsistence species. | |

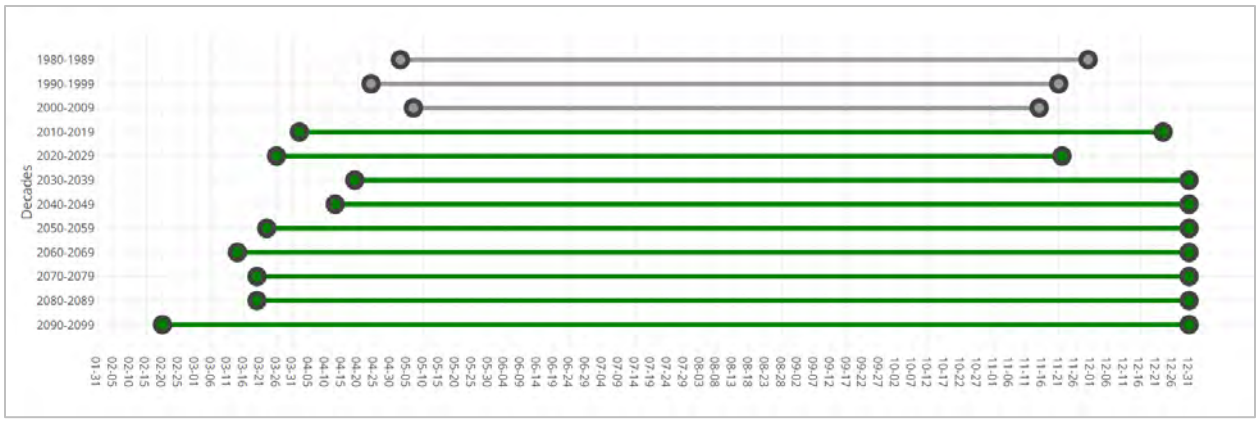
Figure L-15 models historical and future wind event frequency in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts a slight decrease in the overall frequency of high wind events in Sand Point by the end of the century, with a relatively stable frequency of wind speeds in general.




Source: UAF/SNAP 2026- Community Wind

**Figure L-15- Historical and Future Modeled Wind Event Frequency in Sand Point (1980-2099)**

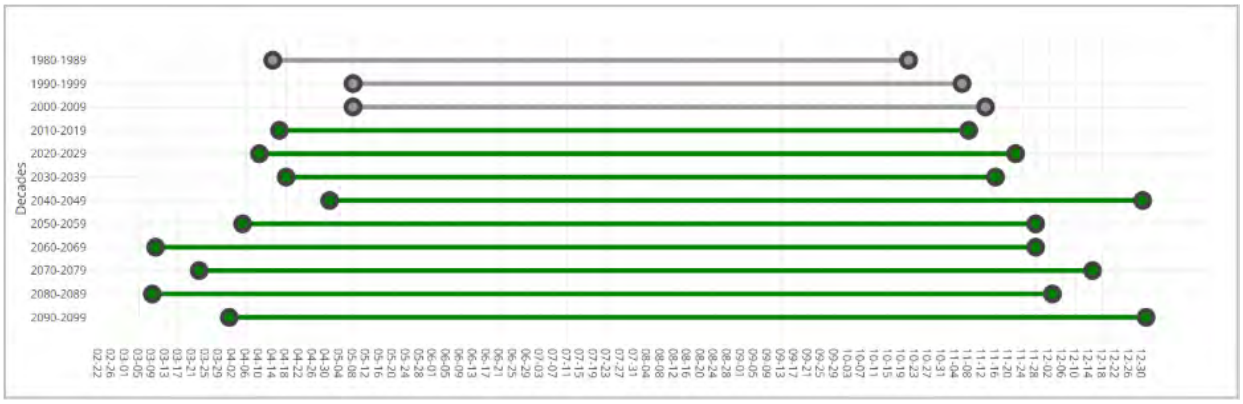
Figure L-16 models historical and future duration of the growing season in Pauloff Harbor from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure L-16- Historical and Future Projected Changes in Growing Season in Pauloff Harbor (1980-2099)**

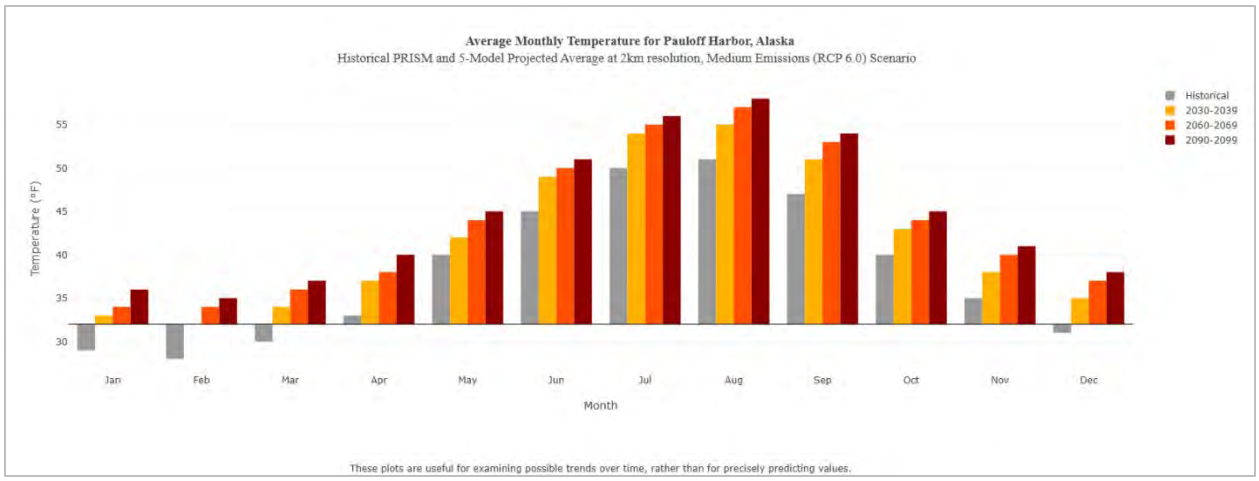
Figure L-17 models historical and future duration of the growing season in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure L-17- Historical and Future Projected Changes in Growing Season in Sand Point (1980-2099)**

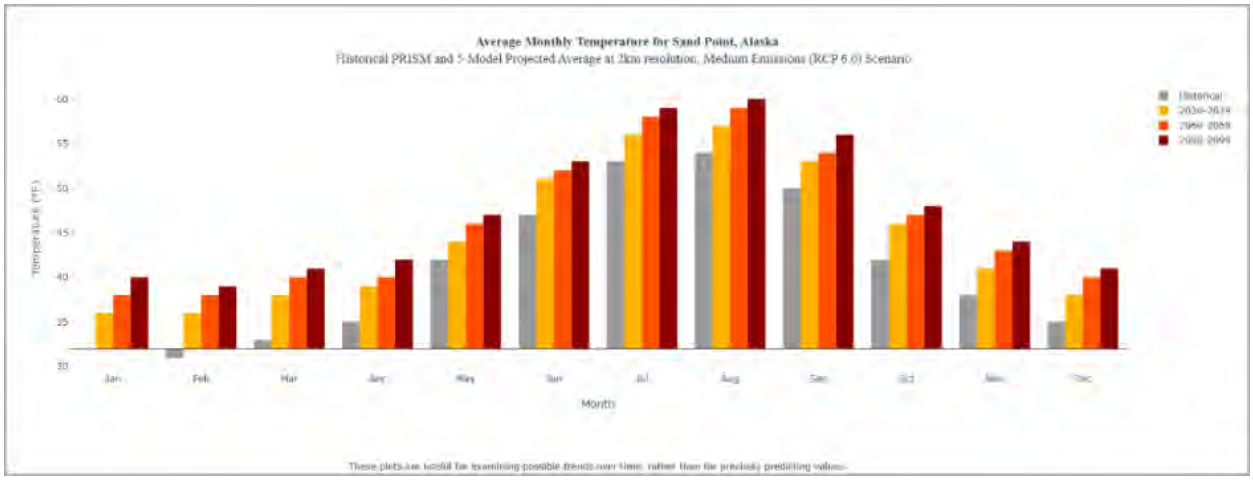
Figure L-18 models historical and future average monthly temperatures in Pauloff Harbor from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure L-18- Historical and Future Projected Average Monthly Temperature in Pauloff Harbor (1980-2099)**

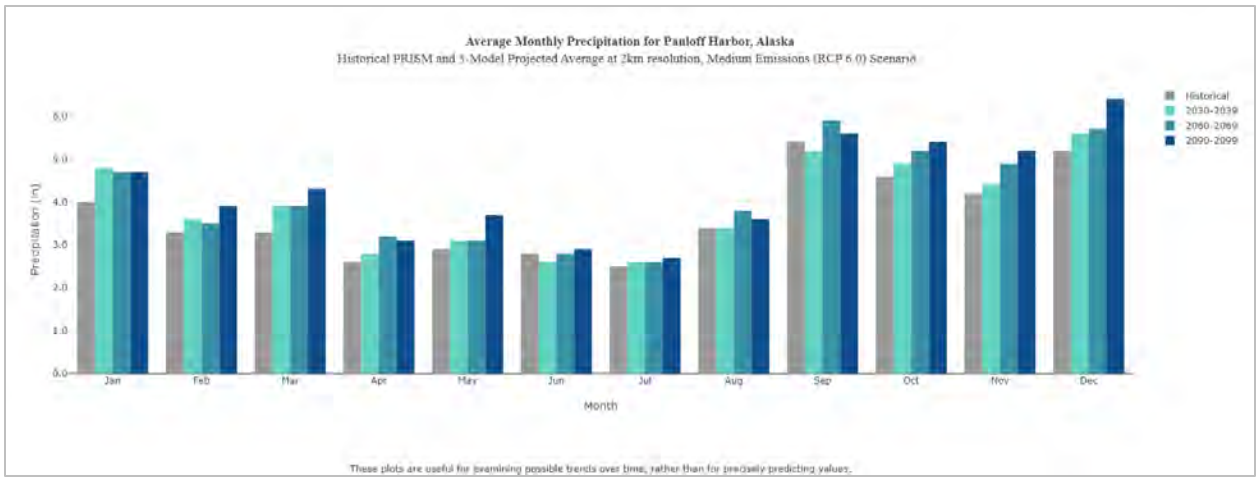
Figure L-19 models historical and future average monthly temperatures in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure L-19- Historical and Future Projected Average Monthly Temperature in Sand Point (1980-2099)**

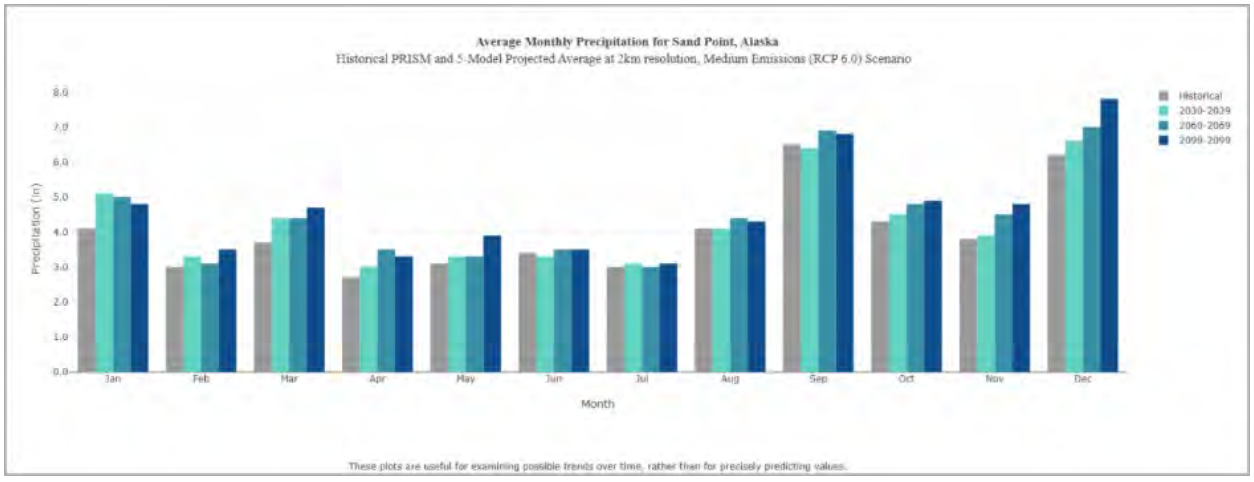
Figure L-20 models historical and future average monthly precipitation in Pauloff Harbor from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure L-20- Historical and Future Projected Average Monthly Precipitation in Pauloff Harbor (1980-2099)**

Figure L-21 models historical and future average monthly precipitation in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure L-21- Historical and Future Projected Average Monthly Precipitation in Sand Point (1980-2099)**

### L.4.1.10 Tsunami

#### L.4.1.10.1 Location

The entire coastline of Pauloff Harbor/Sanak Island and Sand Point is at risk of tsunami impacts.

Formal tsunami inundation mapping is not available for Pauloff Harbor Village/Sanak Island. Therefore, the tsunami hazard area shown in Figure L-22 was estimated by applying a 0.5-mile buffer around shoreline, consistent with the coastal flooding hazard methodology used in the 2023 State of Alaska Hazard Mitigation Plan Update. ***This estimated hazard area is intended for planning purposes only and does not represent actual or modeled tsunami inundation extent, wave characteristics, or depth of inundation.***

Formal tsunami inundation mapping for Sand Point was completed in 2017 (Figure L-23).

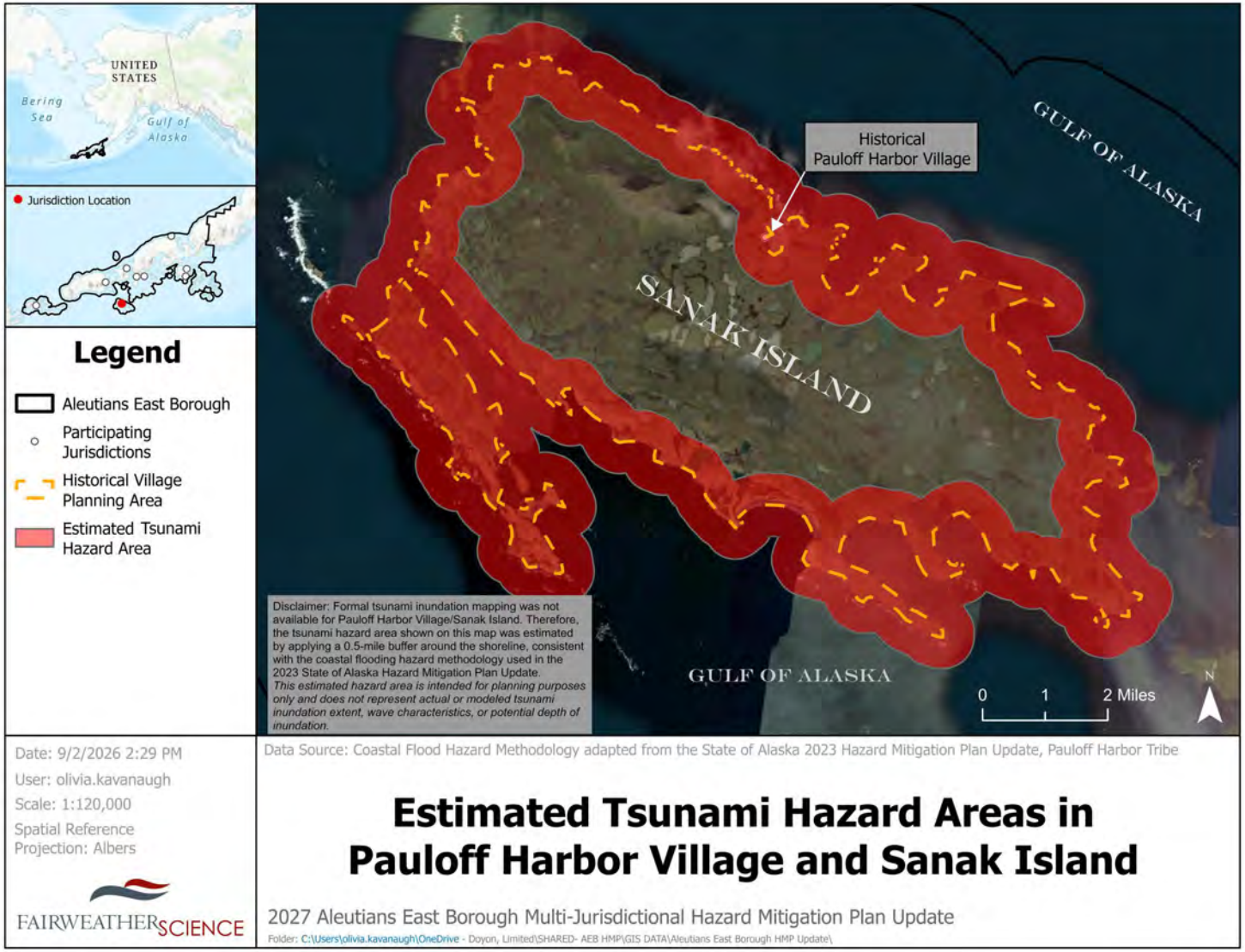



**Figure L-22 - Estimated Tsunami Hazard Areas in Pauloff Harbor Village and Sanak Island**

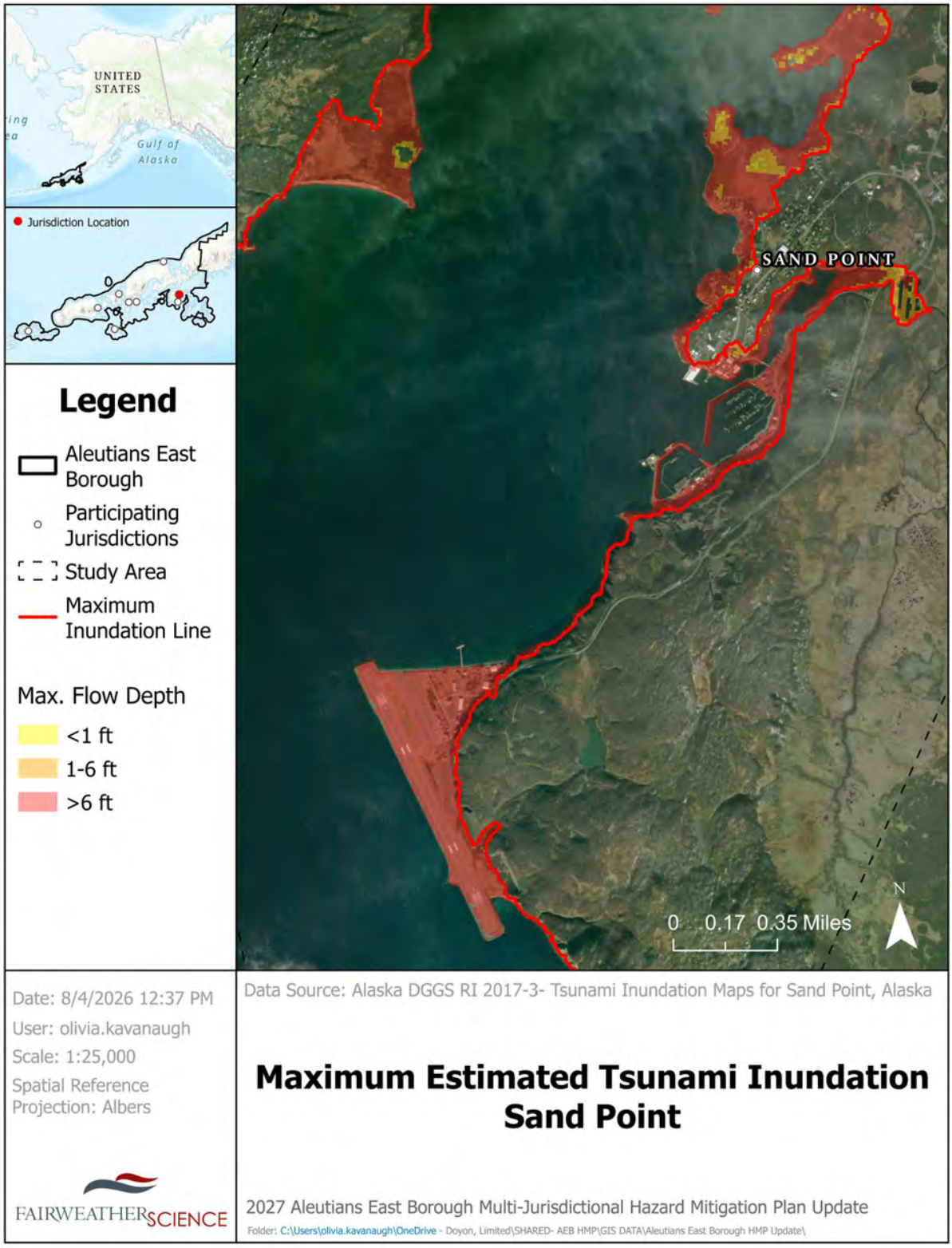



**Figure L-23 - Maximum Estimated Tsunami Inundation in Sand Point**

### L.4.1.10.2 History

Pauloff Harbor Village/Sanak Island and Sand Point are located near historic tsunami events, due to their vast coastline and proximity to the Alaska-Aleutian Megathrust.

See Table 17 in Base Plan for a comprehensive list from the NOAA National Centers for Environmental Information (NCEI) detailing the earthquake-generated tsunamis with observed or measured waves throughout the Aleutians East Borough Planning Area.

Since 1788, there have been 11 documented tsunami runup events on Sanak Island (Table L-4). The most recent runup event on Sanak Island was recorded in 1946.

**Table L-4 - Historical Tsunami Runups- Sanak Island (1788 - August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 2 | 1788-7-21 | SANAK ISLAND, AK | EQ | 8.0 | 98.42 |
| 5 | 1788-8-6 | SANAK ISLAND, AK | EQ | 8.0 | 98.42 |
| 16 | 1946-04-01 | SANAK ISLAND, AK | EQ + LS | 8.6 | 20.01 |
| 41 | 1946-04-01 | E SALMON BAY, SANAK IS | EQ + LS | 8.6 | 21.98 |
| 42 | 1946-04-01 | SE SANDY BAY, SANAK IS | EQ + LS | 8.6 | 20.34 |
| 43 | 1946-04-01 | SE SANDY BAY, SANAK IS | EQ + LS | 8.6 | 50.20 |
| 44 | 1946-04-01 | SANDY BAY, SANAK | EQ + LS | 8.6 | 25.59 |
| 45 | 1946-04-01 | CLIFFORD IS SE (LONG IS) | EQ + LS | 8.6 | 52.82 |
| 46 | 1946-04-01 | CLIFFORD IS SW (LONG IS) | EQ + LS | 8.6 | 54.46 |
| 47 | 1946-04-01 | LONG IS (CENTER) | EQ + LS | 8.6 | 38.71 |
| 48 | 1946-04-01 | LONG IS (NORTHWEST) | EQ + LS | 8.6 | 80.71 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

**1788 Earthquakes and Tsunamis**

According to records kept by Russian explorers and written testimonies cited later by Russian Bishop Ivan Veniaminov, during the summer of 1788, the Aleutian Islands saw two massive, tsunami-producing megathrust earthquakes (estimated at magnitudes of 8.0 to 8.9).

According to the most reliable documentation, the first tsunami occurred on July 21, coinciding with a major earthquake of magnitude 8 or greater, and the second one 16 days later, on August 6. The second tsunami was the highest, reaching maximum runup heights between 50 m and 90 m, and even over 100 m, on Unga Island and Sanak Islands, according to various accounts (Ferrer and Gonzalex-de-Vallejo 2024). There is no direct evidence of these maximum heights, as the data comes from oral references transcribed and translated from original Russian descriptions.

Repeated tsunamis were characteristic of the 1788 earthquakes, indicating an offshore location for these shocks. The people ran inland when the sea withdrew from the shore. Even so, not everyone survived. Writing in 1840, Bishop Veniaminov cited stories about how the flood at Sanak Island "*preceded as strong and infrequent walls*."

Bishop Veniaminov also cited a report stating, "*on 11 July 1788...on Unga [Island] there was such a strong earthquake that it was difficult to stand up, many landslides fell, and after a time a terrible flood occurred*" (UAF Geophysical Institute 1980).

**April 1946 Aleutian Islands Earthquake and Tsunami**

The 1946 Aleutian Islands earthquake and tsunami struck on April 1, 1946, triggered by a powerful magnitude 8.6 undersea earthquake in the Aleutian Trench off Unimak Island, Alaska, which sent devastating Pacific-wide waves that resulted in a handful of deaths in Alaska and 159 deaths in Hilo, Hawaii.

Community oral history provided by the Pauloff Harbor Tribe adds local context to the documented 1946 tsunami. The Tribe shared an account of a child at Sanak Harbor who was directed upstairs for safety and then observed the tsunami moving through the harbor, including drums floating past the house. The account is retained as community oral history and is not used to estimate inundation depth or wave height.

The Tribe has also identified large drift logs at inland locations on Sanak Island beyond the reach of normal tides and storm waves and considers these landscape features consistent with past tsunami inundation and community oral histories.

The tsunami completely obliterated the steel-reinforced concrete Scotch Cap Lighthouse on Unimak Island (in the Aleutians East Borough) and killed all five Coast Guard keepers (National Coast Guard Museum 2024). Run-up heights locally reached up to 138 feet (42 meters).



Source: National Coast Guard Museum 2024

**Figure L-24- Scotch Cap Lighthouse: Before and After the 1946 Tsunami**

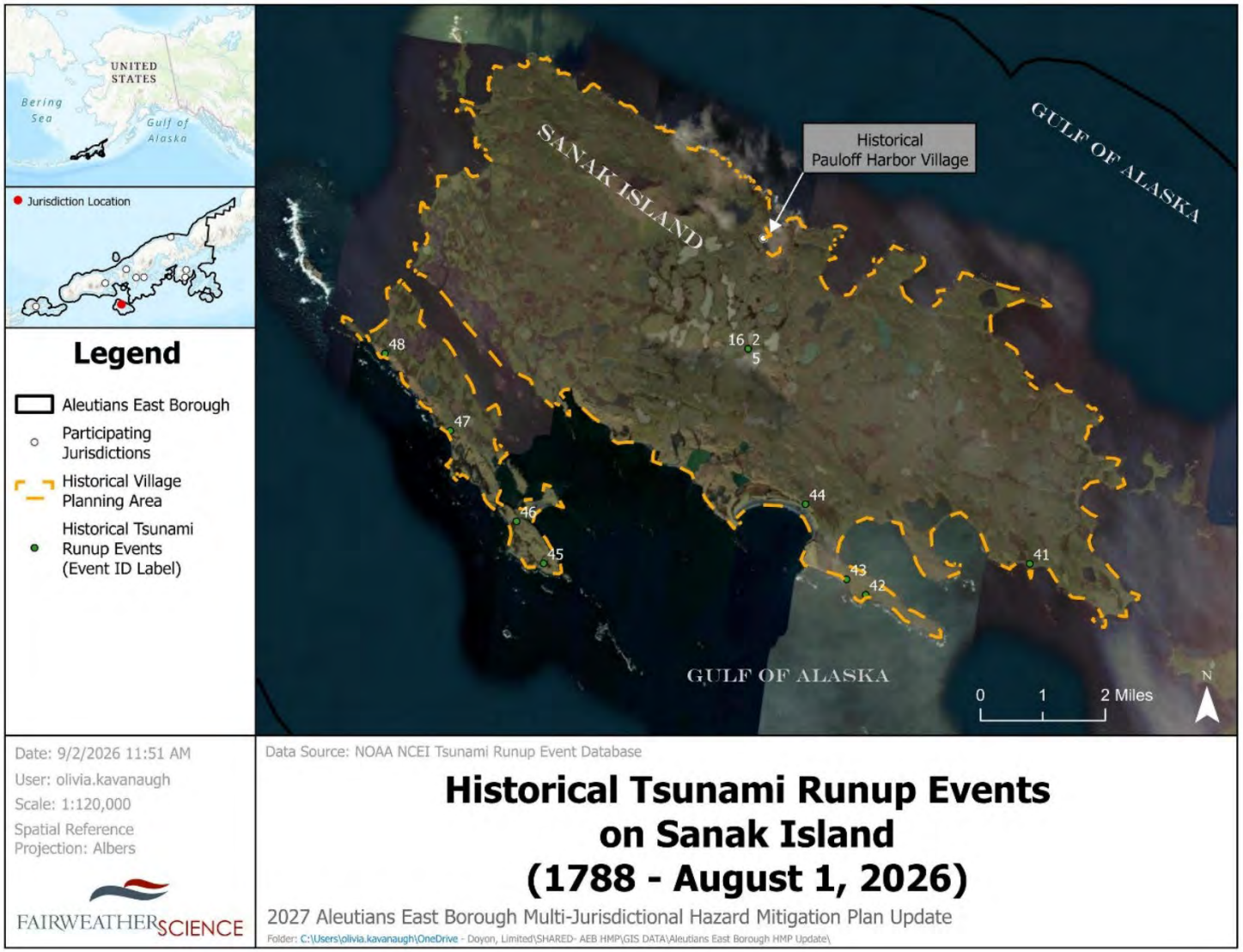



**Figure L-25 – Historical Tsunami Runup Events on Sanak Island (1788 – August 1, 2026)**

Since 1788, there have been 28 documented tsunami runup events in Sand Point (Table L-5). The most recent runup event on Sanak Island was recorded in 2025.

**Table L-5 - Historical Tsunami Runups- Sand Point (1788 - August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 17 | 1946-04-01 | SAND POINT, AK | EQ & LS | 8.6 | Unknown |
| 50 | 1985-03-03 | SAND POINT, AK | EQ | 8.0 | 0.26 |
| 51 | 1986-05-07 | SAND POINT, AK | EQ | 8.0 | 0.16 |
| 52 | 1989-09-04 | SAND POINT, AK | EQ | 7.1 | 0.33 |
| 53 | 1995-07-30 | SAND POINT, AK | EQ | 8.0 | 0.36 |
| 54 | 1996-06-10 | SAND POINT, AK | EQ | 7.9 | 0.16 |
| 55 | 2001-06-23 | SAND POINT, AK | EQ | 8.4 | 0.39 |
| 56 | 2003-11-17 | SAND POINT, AK | EQ | 7.8 | 0.13 |
| 57 | 2004-12-26 | SAND POINT, AK | EQ | 9.1 | 0.46 |
| 59 | 2006-05-03 | SAND POINT, AK | EQ | 8.0 | 0.16 |
| 60 | 2006-11-15 | SAND POINT, AK | EQ | 8.3 | 0.36 |
| 62 | 2007-08-15 | SAND POINT, AK | EQ | 8.0 | 0.13 |
| 65 | 2010-02-27 | SAND POINT, AK | EQ | 8.8 | 1.25 |
| 67 | 2011-03-11 | SAND POINT, AK | EQ | 9.1 | 2.00 |
| 71 | 2012-10-28 | SAND POINT, AK | EQ | 7.7 | 0.20 |
| 72 | 2013-02-06 | SAND POINT, AK | EQ | 7.9 | 0.36 |
| 74 | 2014-04-01 | SAND POINT, AK | EQ | 8.2 | 0.30 |
| 76 | 2015-09-16 | SAND POINT, AK | EQ | 8.3 | 0.62 |
| 79 | 2020-07-22 | SAND POINT, AK | EQ | 7.8 | 0.79 |
| 80 | 2020-10-19 | SAND POINT, AK | EQ | 7.6 | 2.30 |
| 82 | 2021-03-04 | SAND POINT, AK | EQ | 8.1 | 0.52 |
| 83 | 2021-07-29 | SAND POINT, AK | EQ | 8.2 | 1.35 |
| 85 | 2021-07-29 | RANGE ISLAND, SAND POINT, AK | EQ | 8.2 | Unknown |
| 87 | 2021-08-12 | SAND POINT, AK | EQ | 8.1 | 0.20 |
| 89 | 2022-01-15 | SAND POINT, AK | VO | NA | 1.12 |
| 91 | 2023-07-16 | SAND POINT, AK | EQ | 7.2 | 0.49 |
| 92 | 2025-07-16 | SAND POINT, AK | EQ | 7.3 | 0.33 |
| 94 | 2025-07-29 | SAND POINT, AK | EQ | 8.8 | 0.79 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

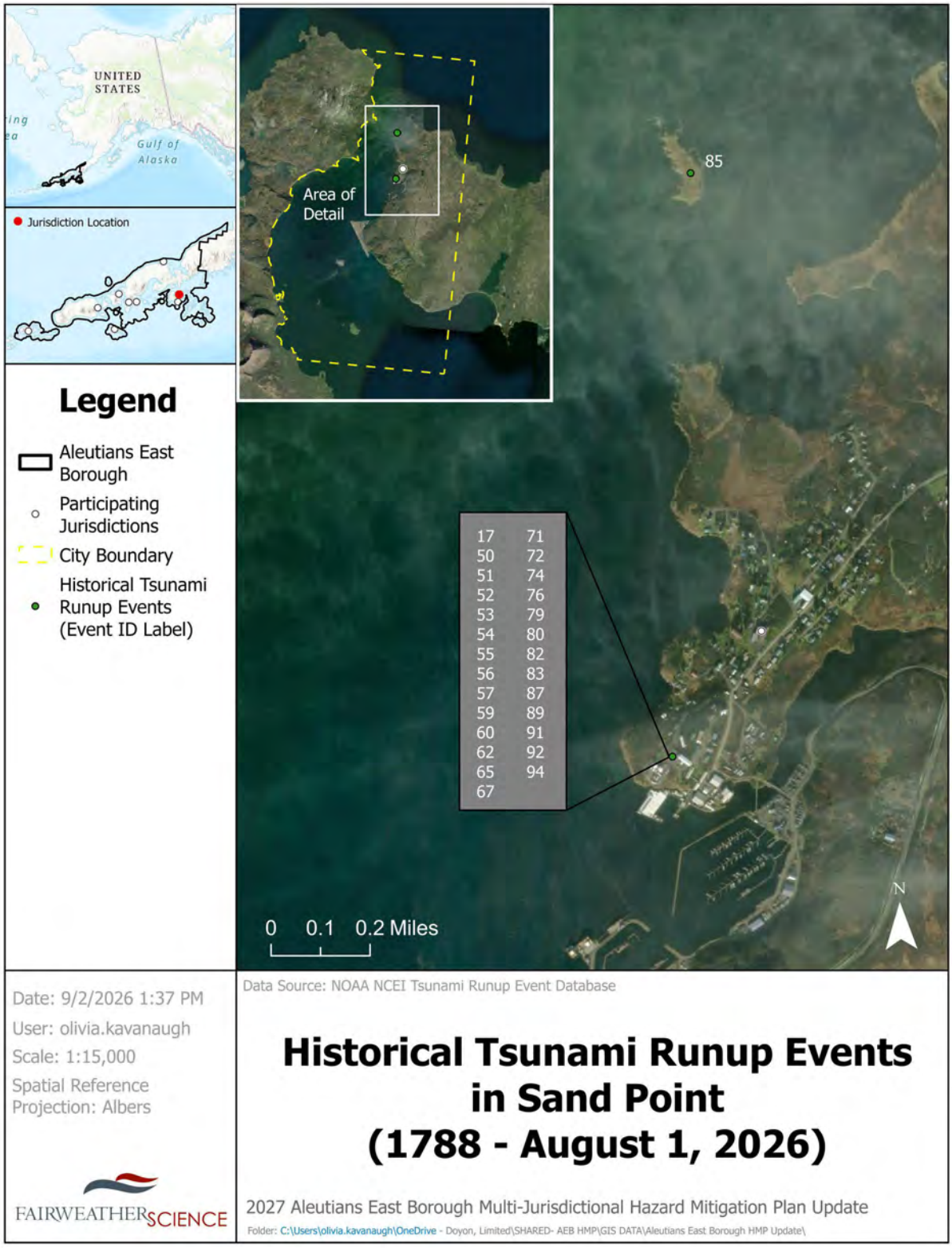



**Figure L-26 – Historical Tsunami Runup Events in Sand Point (1788 – August 1, 2026)**

#### L.4.1.10.3 Extent (Magnitude and Severity)

Sanak Island has experienced tsunami runups ranging in size from 20 feet to over 98 feet. Note that the 98-foot inundation was recorded in 1788 and may not necessarily reflect the actual runup depth due to uncertainties in historical observations, or the location and elevation of the measurement.

In recent history (1946 to current), the maximum runup depth was recorded at 54.46 feet (on the Long Island, adjacent to Sanak Island) due to the 1946 earthquake and landslide event near the Aleutian Islands.

Sand Point has experienced tsunami runups ranging in size from less than 1 foot to 2.3 feet.

None of these events impacted critical facilities on Sanak Island or in Sand Point.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in Pauloff Harbor is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in Sand Point is considered **Critical,** with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### L.4.1.10.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | There have been documented tsunami runups up to 2.3 feet in Sand Point and over 98 feet on Sanak Island. Future tsunami runups could potentially match or exceed these heights, having significant impact on the shoreline. |
| Infrastructure | There are no recorded infrastructure impacts from tsunamis on Sanak Island or in Sand Point. Water damage in coastal lying infrastructure is possible during a tsunami, as is damage to boat harbors, roadways, and airport runways.<br>Critical facilities at risk of tsunami inundation include the Salmon Hatchery, Aquaculture Building, Church, Saint Nicholas Church, Storage Building, Volunteer Fire Department Building, Fire Boat, FAA Building, ARFF / SREB Building, Robert E. Galovin Small Boat Harbor, Harbor House, Sand Point Boat Storage, Trident Seafood Dock, SDP 150 Ton Travel Lift, Sand Point Harbor, Large Boat Dock, Harbor Dock, Cargo Storage Area, Sand Point Ferry Dock, City Dock, Sand Point DOT, Reeve Air Building, Aviation Terminal, Airport Runway, Small Airplane Storage, Water Reservoir, City Pump House, and Humboldt Creek Reservoir Dam. |
| People | There is no record of injuries or fatalities due to tsunamis on Sanak Island or in Sand Point. Injuries and death are possible during a tsunami runup due to drowning, being swept into debris, or trapped during inundation. |
| Utilities | There is no record of utility disruptions due to tsunamis. Tsunamis can damage underground water and sewer lines, underwater cables, overhead power lines, and septic systems. |
| Transportation | There are no recorded tsunami related impacts on transportation systems. Future tsunamis could impact road and air travel by damaging or inundation runway surfaces and roadways. Marine travel could also be limited or delayed due to damage to boat harbors, marine vessels, or fueling stations along the coast. |
| Economy | There are no recorded economic impacts due to tsunamis in Pauloff Harbor or Sand Point. |
| Subsistence Resources | There are no recorded tsunami related impacts on subsistence resources in Pauloff Harbor or Sand Point. |

#### L.4.1.10.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Pauloff Harbor Village/Sanak Island will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Sand Point will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### L.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in Pauloff Harbor or Sand Point is not anticipated to change in the future. |
| Location | The location of tsunami events in Pauloff Harbor or Sand Point is not anticipated to change in the future. All low-lying coastal areas in Sand Point will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in Pauloff Harbor or Sand Point. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in Pauloff Harbor and Sand Point. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in Pauloff Harbor and Sand Point. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in Pauloff Harbor and Sand Point, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in Sand Point could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in Pauloff Harbor and Sand Point, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in Sand Point, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area. Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in Pauloff Harbor or Sand Point. |

### L.4.1.11 Volcano

#### L.4.1.11.1 Location

The entire geography of Pauloff Harbor Village and Sand Point are vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.

Pauloff Harbor Village is located in relatively close proximity to active volcanoes such as Mount Shishaldin and Mount Pavlof.

According to the 2023 State of Alaska HMP, Pauloff Harbor Village and Sand Point are located in a **moderate** volcanic ash hazard level area.

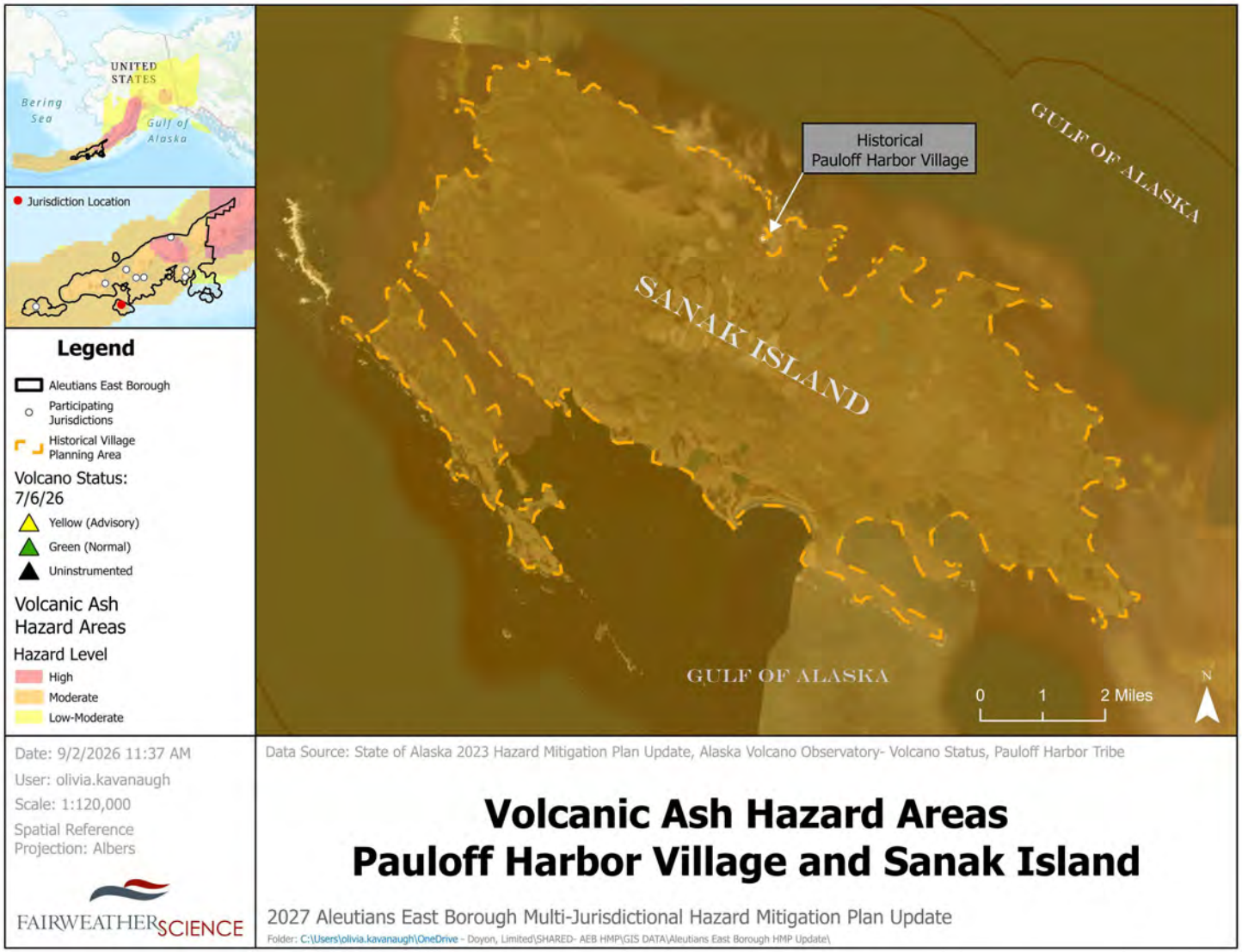



**Figure L-27 –Volcanic Hazard Areas- Pauloff Harbor Village and Sanak Island**

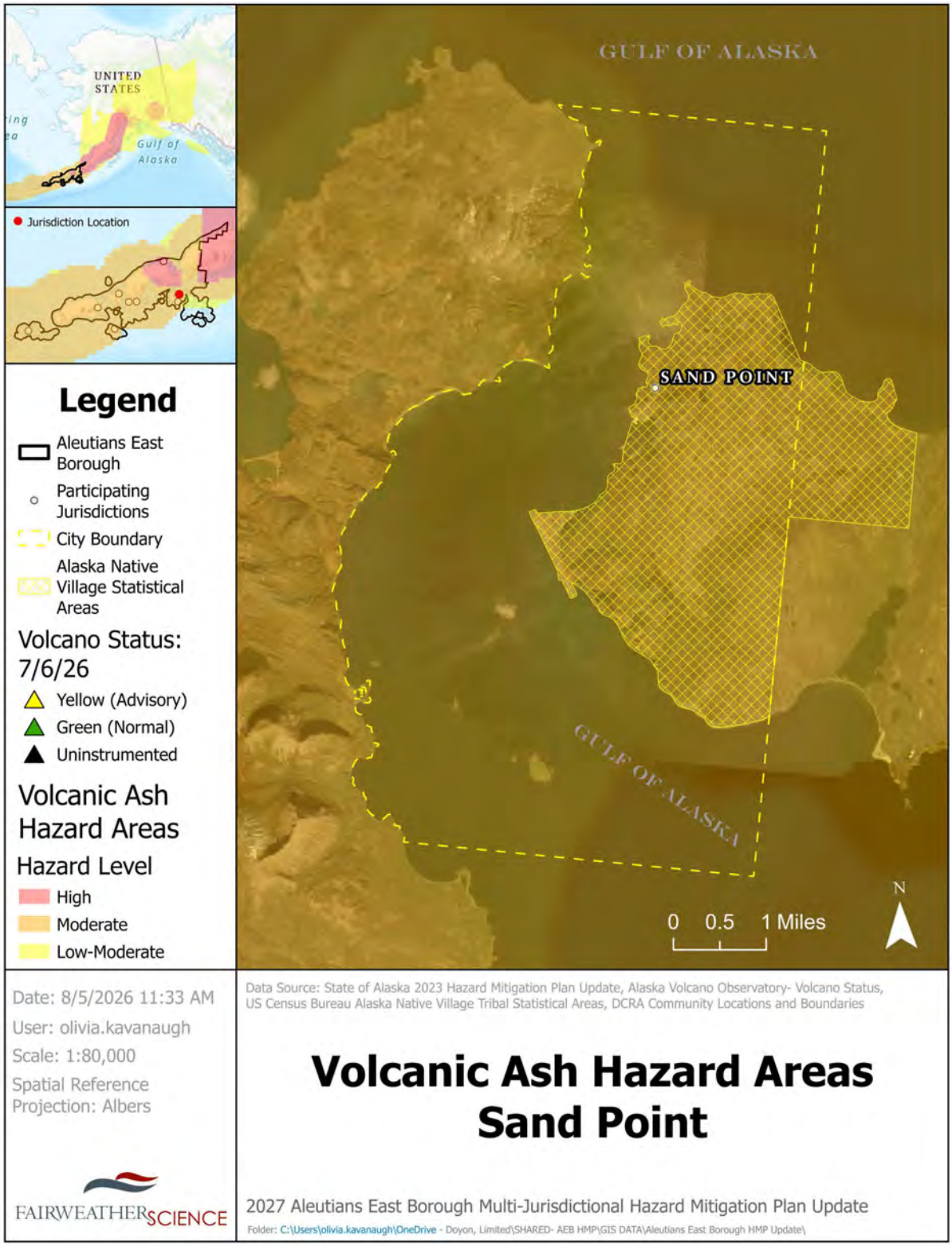



**Figure L-28 – Sand Point Volcanic Hazard Areas**

#### L.4.1.11.2 History

Pauloff Harbor Village and Sand Point have had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to Sand Point is **Mount Pavlof**, which is approximately 55 miles west of the community. Pavlof has erupted a total of 31 times since 1900, with several of them resulting in localized impacts. The eruptions in 1975, 1996, 2007, 2013, and 2014 resulted in light ash fall accumulating in several AEB communities, including Sand Point.

**Mount Shishaldin** is a historically active volcano that has resulted in several eruptions that has impacted the AEB, including Sand Point. Located approximately 143 miles southwest of Sand Point, Shishaldin has erupted a total of 24 times since 1900. In 2023, it was reported that an eruption from Shishaldin resulted in light ash fall accumulating in Sand Point (AVO 2023).

While data on historical accounts of volcanoes at Pauloff Harbor Village are limited, the area's proximity to several communities in the Planning Area makes it possible that Pauloff Harbor Village have experienced impacts from volcanoes such as Mount Shishaldin and Mount Pavlof.

#### L.4.1.11.3 Extent (Magnitude and Severity)

Pauloff Harbor Village/Sanak Island and Sand Point are located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026).

Based on recorded eruptions and data from other surrounding volcanoes, Sand Point has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community.

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the historical extent of volcanoes in Pauloff Harbor Village is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcanoes in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### L.4.1.11.4 Previous Impacts

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding Sand Point has been ashfall. While most of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposit (USGS 2015).<br>While volcanoes are identified as a concern in Pauloff Harbor Village, there is limited data of its impact to the geography and land in the area. |
| Infrastructure | The historical ashfall reported in Pauloff Harbor Village and Sand Point has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of Sand Point from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community.<br>While volcanoes are identified as a concern in Pauloff Harbor Village, there is limited data of its impact to people in the area. |
| Utilities | There have been no documented cases of volcanic eruptions causing utility disruptions in Sand Point. While wet ash can cause power outages by coating |

| | Description of Previous Impacts |
|---|---|
| | insulators and transformers, the ashfall in the community from past eruptions have only resulted in trace amounts scattered throughout Sand Point (USGS 2015).<br>There are no utilities in Pauloff Harbor Village that can be impacted by volcanic eruptions. |
| Transportation | The primary transportation related impact from a volcanic eruption in Sand Point is aircraft and marine interruptions. Ash clouds from Mount Pavlof's 2013 and 2014 eruptions caused flights from the Sand Point Airport to be cancelled for a total of 1 week (AVO 2014).<br>While volcanoes are identified as a concern in Pauloff Harbor Village, there is limited data of its impact to transportation in the area. Transportation to Sanak Island is needed for Tribal activities, field work, subsistence activities, and emergency response, which can be impacted by volcanic ash. |
| Economy | The primary economic related impact from a volcanic eruption in Sand Point is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations.<br>While volcanoes are identified as a concern in Pauloff Harbor Village, there is limited data of its impact to the economy in the area. |
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in Pauloff Harbor Village or Sand Point that has impacted the community's access to subsistence resources. Volcanic ash may disrupt marine travel, which can impact access to Sanak Island for subsistence activities. Besides access, Sanak Island's water, vegetation, wildlife, and traditional subsistence areas can also be impacted by volcanic ashfall. |

#### L.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact Pauloff Harbor Village or Sand Point.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Pauloff Harbor Village will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Sand Point will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### L.4.1.11.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in Pauloff Harbor Village or Sand Point. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in Pauloff Harbor Village or Sand Point. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in Pauloff Harbor Village or Sand Point. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in Pauloff Harbor Village or Sand Point. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in Pauloff Harbor Village or Sand Point. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in Pauloff Harbor Village or Sand Point. |
| Land Use Development | Future climate conditions are not expected to influence land use development in Pauloff Harbor Village or Sand Point. |
| Subsistence Resources | Future climate conditions are not expected to influence the ability to access subsistence resources in Pauloff Harbor Village or Sand Point. |

### L.4.1.12 Wildfire

#### L.4.1.12.1 Location

According to LANDFIRE's (Landscape Fire and Resource Management Planning Tools Project) 2025 Alaska Statewide Wildfire Exposure Assessment, the majority of the Pauloff Harbor and Sand Point Planning Areas are located in an area that is **Minimally Exposed to Wildfire Hazard**. The population center of Sand Point is located in an area that is Infrequently Exposed to Wildfire Hazard (Figure L-31).

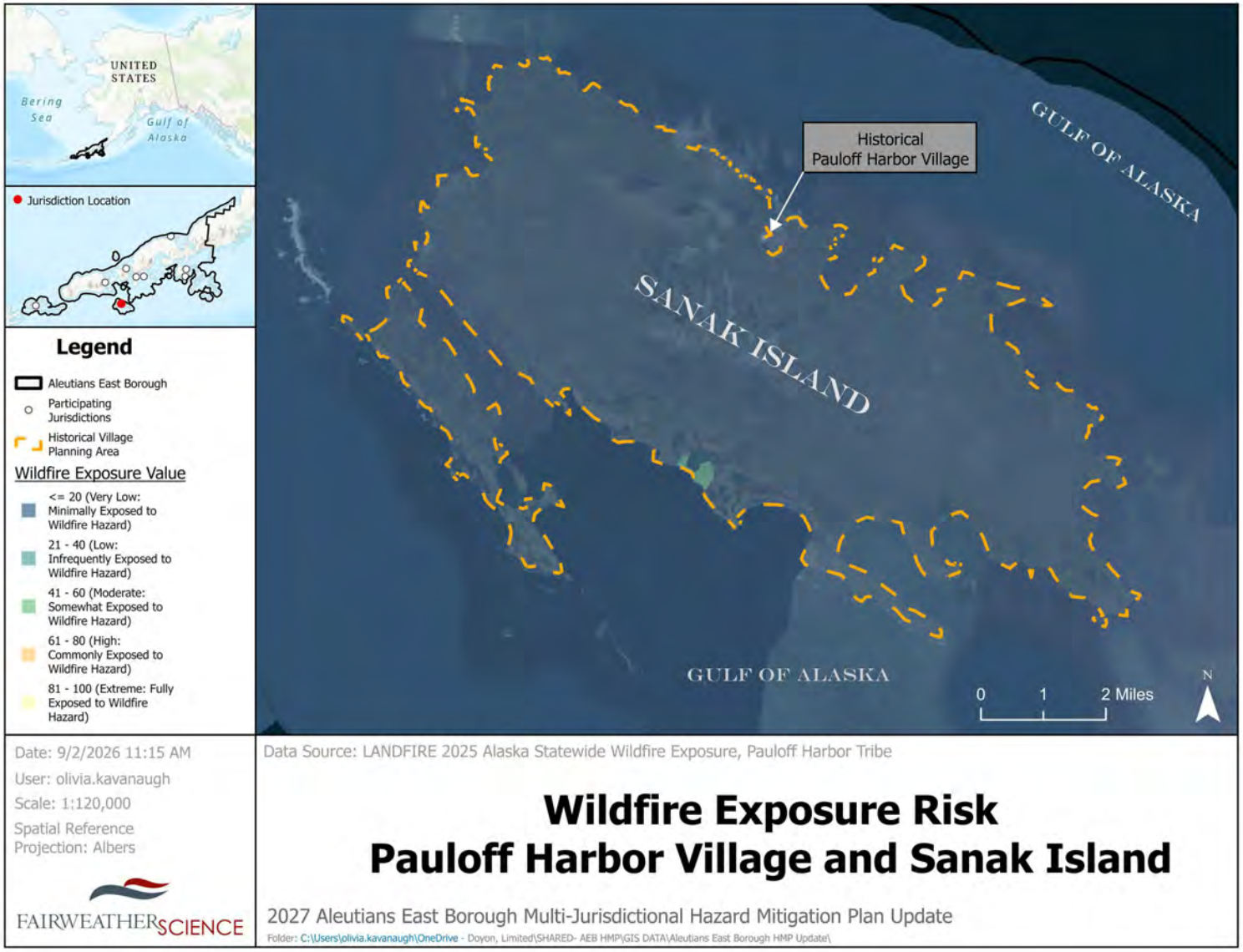



**Figure L-29- Wildfire Exposure Risk- Pauloff Harbor and Sanak Island**




Note: No fires were documented on Sanak Island between 1939 to December 2025 by the AICC. This may not accurately reflect fire history on Sanak Island due to no year-round population and limited monitoring and reporting.

**Figure L-30- Historical Fire Events near Pauloff Harbor Village and Sanak Island (1939 – December 2025)**

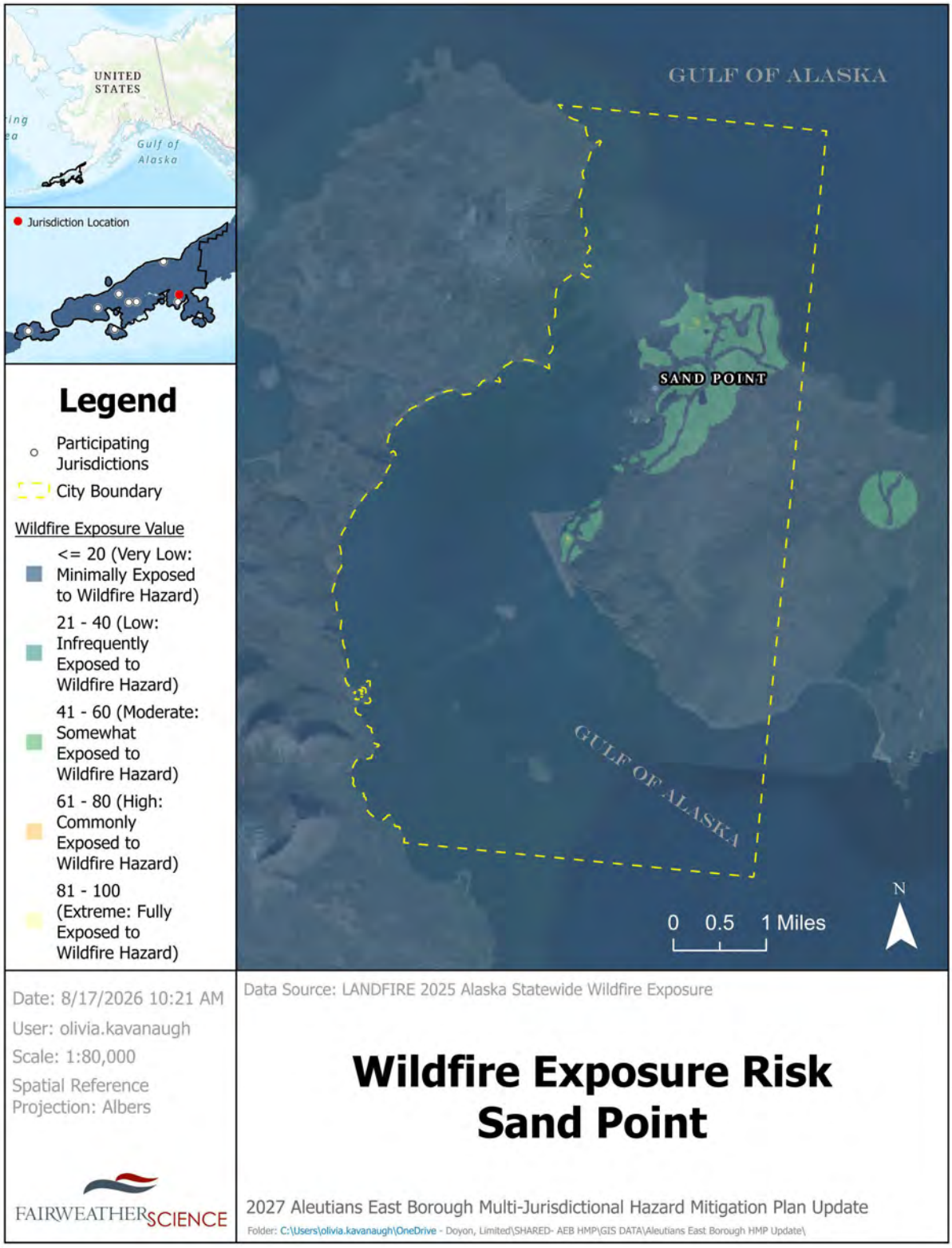



**Figure L-31- Sand Point Wildfire Exposure Risk**

### L.4.1.12.2 History

Figure L-32 depicts historical fire events near Sand Point and Unga Island. All these fires were due to human negligence, not natural causes. Historical fire events were not reported near the Pauloff Harbor Village on Sanak Island.

Table L-6 lists historical fires in and around Sand Point from 1939 to December 2025. None of these fires had a confirmed natural cause due to lightning and were all human-caused or of unknown origin (AICC 2026).

**Table L-6- Historical Wildfires in and around Sand Point (1939 - December 2025)**

| Discovery Date | Name | Prescribed Fire? | Latitude | Longitude | Estimated Total Acres | Cause |
|---|---|---|---|---|---|---|
| 1965-04-18 | Unga Island | No | 55.33333 | -160.55 | 320 | Human-Recreation |
| 1996-05-18 | Popof | No | 55.31667 | -160.5 | 30 | Cooking Fire |
| 2010-05-25 | Sand Point | No | 55.33389 | -160.491 | 3.5 | Human |
| 2019-07-04 | Unga Island | No | 55.2693 | -160.675 | 0.1 | Investigated but cause Undetermined |
| 2022-05-12 | Danger Point | No | 55.34275 | -160.435 | 70.4 | Human- Debris Burning |

Source: AICC 2026

There have been no State or Federal disaster declarations in Sand Point due to wildfires.

The Pauloff Harbor Tribe Planning Team reported that Sanak has extensive grass/tundra vegetation, strong winds, and very limited firefighting capability. They reported that even a low-probability fire could affect cultural resources, historic sites, wildlife habitat, subsistence areas, and future infrastructure.

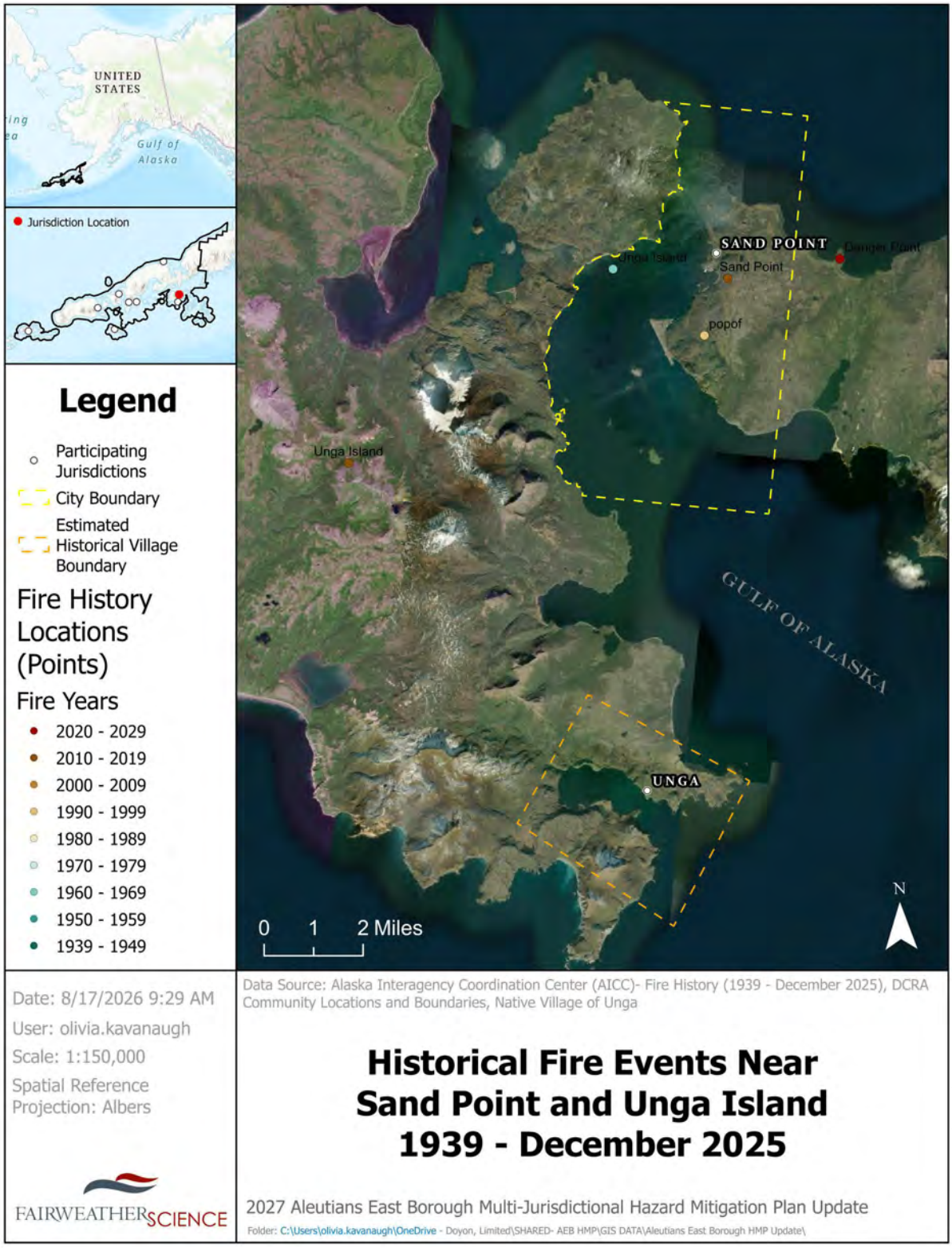



**Figure L-32- Historical Fire Events near Sand Point and Unga Island (1939 – December 2025)**

#### L.4.1.12.3 Extent (Magnitude and Severity)

Wildfire can destroy vegetation, negatively impact air quality, and leave land scarring that could increase the risk of landslides, flood, and sediment deterioration/land destabilization.

The largest fire near Sand Point burned 320 acres on Unga Island in April 1965. This fire was due to human recreation. The most recent fire, *Danger Point Fire*, occurred in May 2022 and burned 70.4 acres east of city limits. This fire was due to human negligence in debris burning.

Based on the extent of past wildfire events and the criteria identified in Table 5 of the Base Plan, the extent of wildfire in Sand Point is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past wildfire events and the criteria identified in Table 5 of the Base Plan, the extent of wildfire in Pauloff Harbor Village and Sanak Island is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### L.4.1.12.4 Impact

There are no recorded historical impacts of wildfire in Sand Point, the historic Pauloff Harbor Village site, or on Sanak Island.

The Planning Team reported that even a low-probability fire could affect cultural resources, historic sites, wildlife habitat, subsistence areas, and future infrastructure.

Wildland fires can cause air transportation impacts including damage to structures that support air travel and fire fighting equipment and personnel. Smoke from wildland and urban fires can disrupt air transportation and in extreme scenarios, fire can damage runway areas making them not suitable for aircraft arrivals and departures.

| | Description of Impact |
|---|---|
| Geography/Land | The largest fire near Sand Point burned 320 acres on Unga Island in April 1965. This fire was due to human recreation. The most recent fire, Danger Point Fire, occurred in May 2022 and burned 70.4 acres east of city limits. This fire was due to human negligence in debris burning. |
| Infrastructure | The Planning Team did not report specific previous wildfire impacts to infrastructure in Sand Point or on Sanak Island, although they note that a future fire could impact historic sites, cultural resources, and future infrastructure. |
| People | The Planning Team did not report specific previous wildfire impacts to people in Sand Point or on Sanak Island. |
| Utilities | The Planning Team did not report specific previous wildfire impacts to utilities in Sand Point or on Sanak Island. |
| Transportation | The Planning Team did not report specific previous wildfire impacts to transportation in Sand Point or on Sanak Island. |
| Economy | The Planning Team did not report specific previous economic wildfire impacts in Sand Point or on Sanak Island. |
| Subsistence Resources | The Planning Team did not report specific previous wildfire impacts to subsistence resources in Sand Point or on Sanak Island, although they did report that a future fire could impact wildlife habitat and subsistence resources. |

### L.4.1.12.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Sand Point will experience a wildfire event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Possible** that the Pauloff Harbor village site and Sanak Island will experience a wildfire event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

### L.4.1.12.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of wildland fires in the Planning Area, including Sanak Island, is not anticipated to change in respect to future climate conditions. |
| Location | The location of wildland fires in the Planning Area, including Sanak Island, is anticipated to change slightly in respect to future climate conditions, as some areas see a higher likelihood of burning than in the past. Most of these areas are far from communities and infrastructure, with the exception of Sand Point (UAF IARC 2026). |
| Extent (Magnitude and Severity) | Due to future climate conditions, the extent (magnitude and severity) of wildland fires is expected to increase in Alaska in general. Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050 (EPA 2022). In the AEB, more acreage is trending from “less likely to burn” to “more likely to burn” (UAF IARC 2026). |
| Impact | Due to future climate conditions, the impact of wildland fires on the Planning Area, including Sanak Island, may increase. More frequent fires due to a change in future conditions may increase the risk of health hazards and low visibility posed by the increase of smoke (AFSC 2025). |
| Probability of Future Events | Future climate conditions within Alaska are likely to result in increased drought and longer fire seasons. Shifts in vegetation will influence the intensity and frequency of fires (IPCC 2019). A warming climate is also projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018).<br>Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050, however this is most applicable to Alaska’s most fire-prone regions in the interior (EPA 2022). |
| Population Patterns | Wildland fires due to future climate conditions are not anticipated to impact population patterns in the Planning Area, including Sand Point and Sanak Island. |
| Land Use Development | Wildland fires due to future climate conditions may influence the location of future development in areas with higher fire risk, although in most areas with year-round populations and infrastructure, the wildfire risk is expected to remain low. |
| Subsistence Resources | A warming climate is projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018). |

## L.4.2 Critical Facilities

**Table L-7- Critical Facilities- Pauloff Harbor Tribe**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Pauloff Harbor Tribe-Historical Village/ Sanak Island | Community | 0 | Pauloff Harbor Cemetery | - | 54.454459 | -162.700664 | $1,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 2 | Pauloff Harbor Tribe-Historical Village/ Sanak Island | Community | 0 | Sanak Harbor Cemetery | Sanak Harbor | 54.478815 | -162.812285 | $1,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 3 | Pauloff Harbor Tribe-Historical Village/ Sanak Island | Community | 10 | Pauloff Harbor Field Office Cabin | Pauloff Harbor | 54.456441 | -162.699118 | $200,000 | Wood Frame | Sanak Corp | Sanak Corp | | | x | x | x | | x | x | x | x | | |
| 4 | Pauloff Harbor Tribe-Historical Village/ Sanak Island | Community | 10 | Emergency Shelter Cabin | Dodd's Bay | 54.399687 | -162.715045 | $33,000 | Wood Frame | Sanak Corp | Sanak Corp | | | x | | x | | x | x | x | x | | |
| 5 | Pauloff Harbor Tribe-Historical Village/ Sanak Island | Utilities | 10 | Generator House | Pauloff Harbor | 54.456447 | -162.699559 | $200,000 | Wood Frame | Pauloff Harbor Tribe | Sanak Corp | | | x | x | x | | x | x | x | x | | |
| 6 | Pauloff Harbor Tribe-Historical Village/ Sanak Island | Utilities | 10 | Maintenance Building | Pauloff Harbor | 54.455279 | -162.721413 | $200,000 | Metal Frame | Pauloff Harbor Tribe | Sanak Corp | | | x | | | x | x | | x | x | | |
| 7 | Pauloff Harbor Tribe-Historical Village/ Sanak Island | Transportation | 10 | Sanak Island Historic Trail System | Sanak Island | throughout Sanak Island | throughout Sanak Island | $1,000,000 | Trail/Transportation Infrastructure | Pauloff Harbor Tribe | Sanak Corp | | | x | x | x | x | x | x | x | x | | |
| 8 | Pauloff Harbor Tribe-Historical Village/ Sanak Island | Transportation | 10 | Pauloff Harbor Dock and Mooring Area | Pauloff Harbor, Sanak Alaska | 54.455022 | 162.699588 | $1,000,000 | Marine Infrastructure/ Dock/Mooring Area | | | | | x | x | x | | x | x | x | x | | |
| 9 | Pauloff Harbor Tribe-Sand Point | Government | 5 | Pauloff Harbor Tribe- Tribal Office | Church Ln | 55.340732 | -160.498235 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 10 | Pauloff Harbor Tribe-Sand Point | Commercial | 0 | Salmon Hatchery | Airport Rd | 55.341478 | -160.485901 | $1,000,000 | | | | | | x | | x | | x | x | x | x | x | |
| 11 | Pauloff Harbor Tribe-Sand Point | Commercial | 0 | Aquaculture Building | 3524 Aiport Rd | 55.341394 | -160.486714 | $1,000,000 | | | | | | x | | x | | x | x | x | x | x | |
| 12 | Pauloff Harbor Tribe-Sand Point | Commercial | 40 | Alaska Commercial Company - Grocery Store | 100 Main St | 55.342159 | -160.496118 | $5,000,000 | | Shumagin Native Corporation | | | | x | | x | | x | | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | Pauloff Harbor Tribe-Sand Point | Commercial | 0 | Humboldt Quarry | Airport Rd | 55.327829 | -160.501685 | $20,000,000 | | | | | | x | | x | x | x | | x | x | | |
| 14 | Pauloff Harbor Tribe-Sand Point | Community | 0 | Swimming Pool | 269 Red Cove Rd | 55.351964 | -160.475965 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 15 | Pauloff Harbor Tribe-Sand Point | Community | 0 | Baseball Field | Red Cove Rd | 55.350567 | -160.475336 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 16 | Pauloff Harbor Tribe-Sand Point | Community | 0 | Unites States Postal Service | 9998 Main St | 55.346554 | -160.487202 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 17 | Pauloff Harbor Tribe-Sand Point | Community | 0 | Cemetery | Pavlof Ave | 55.342559 | -160.496948 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 18 | Pauloff Harbor Tribe-Sand Point | Community | 0 | E.A.T / Teen Center | 1314 Sand point Ave | 55.339947 | -160.497604 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 19 | Pauloff Harbor Tribe-Sand Point | Community | 20 | Church | Baptist Church | 55.340778 | -160.499087 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 20 | Pauloff Harbor Tribe-Sand Point | Community | 20 | Saint Nicholas Church | Sand Point Ave | 55.336742 | -160.497364 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 21 | Pauloff Harbor Tribe-Sand Point | Community | 0 | Trident Cemetery | Tolsytoi Ave | 55.336586 | -160.500552 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 22 | Pauloff Harbor Tribe-Sand Point | Community | 0 | Storage Building | Boat Harbor Rd | 55.334232 | -160.495101 | $50,000 | | | | | | x | | x | | x | x | x | x | | |
| 23 | Pauloff Harbor Tribe-Sand Point | Education | 1000 | Sand Point School | 269 Red Cove Rd | 55.35171 | -160.475684 | $38,379,381 | | | | | | x | | x | | x | | x | x | | |
| 24 | Pauloff Harbor Tribe-Sand Point | Education | 50 | Library | 269 Red Cove Rd | 55.351539 | -160.475433 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 25 | Pauloff Harbor Tribe-Sand Point | Emergency Response | 10 | Volunteer Fire Department | 100 Sand Point Rd | 55.340735 | -160.489419 | $1,000,000 | | | | | | x | | x | | x | x | x | x | x | |
| 26 | Pauloff Harbor Tribe-Sand Point | Emergency Response | 0 | Fire Boat | Small Boat Harbor | 55.334289 | -160.49923 | $50,000 | | | | | | x | | x | | x | x | x | x | | |
| 27 | Pauloff Harbor Tribe-Sand Point | Government | 0 | KSDP Radio Station | 5500 Red Cove Rd | 55.349578 | -160.472725 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 28 | Pauloff Harbor Tribe-Sand Point | Government | 0 | Aleutians East Borough Garage | 4056 Humbolt Ln | 55.344665 | -160.481921 | $50,000 | | | | | | x | | x | | x | | x | x | | |
| 29 | Pauloff Harbor Tribe-Sand Point | Government | 0 | Aleutians East Borough Office | 349 Humbolt Ln | 55.344317 | -160.481758 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 30 | Pauloff Harbor Tribe-Sand Point | Government | 0 | ADF&G Shed | 3000 B Sand Point Ave | 55.345612 | -160.488508 | $50,000 | | | | | | x | | x | | x | | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | Pauloff Harbor Tribe-Sand Point | Government | 0 | TelAlaska Tower | 100 Sand Point Ave | 55.342566 | -160.494149 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 32 | Pauloff Harbor Tribe-Sand Point | Government | 10 | City Hall | 423 Main St | 55.340985 | -160.498091 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 33 | Pauloff Harbor Tribe-Sand Point | Government | 0 | Sand Point City Public Works | 1000 Airport Rd | 55.335356 | -160.490407 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 34 | Pauloff Harbor Tribe-Sand Point | Government | 0 | USGS Shumagin Magnetic Observatory | 1000 Airport Rd | 55.335274 | -160.491416 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 35 | Pauloff Harbor Tribe-Sand Point | Government | 0 | FAA Building | Airport Rd | 55.317117 | -160.519873 | $500,000 | | | | | | x | | x | x | x | x | x | x | | |
| 36 | Pauloff Harbor Tribe-Sand Point | Government | 0 | ARFF / SREB Building | Airport Rd | 55.316828 | -160.520543 | $500,000 | | | | | | x | | x | x | x | x | x | x | | |
| 37 | Pauloff Harbor Tribe-Sand Point | Government | 0 | FAA Satellite Communication Dish | Airport Rd | 55.317117 | -160.519873 | $5,000,000 | | | | | | x | | x | x | x | x | x | x | | |
| 38 | Pauloff Harbor Tribe-Sand Point | Medical | 20 | Sand Point Community Health Center | 172 Red Cove Rd | 55.347559 | -160.485798 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 39 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Robert E. Galovin Small Boat Harbor | | 55.33192077 | -160.5007394 | $60,000,000 | | | | | | x | | x | x | x | x | x | x | | |
| 40 | Pauloff Harbor Tribe-Sand Point | Transportation | 5 | Harbor House | | 55.33517231 | -160.4963178 | $50,000 | | | | | | x | | x | | x | x | x | x | | |
| 41 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Sand Point Boat Storage | Boat Harbor Rd | 55.336818 | -160.495245 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 42 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Trident Seafood Dock | Chichagof Ave | 55.335219 | -160.5011456 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 43 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | SDP 150 Ton Travel Lift | Boat Harbor Rd | 55.33481 | -160.496252 | $5,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 44 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Sand Point New Harbor | Boat Harbor Rd | 55.331477 | -160.501896 | $60,000,000 | | | | | | x | | x | x | x | x | x | x | | |
| 45 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Big Boat Dock | Boat Harbor Rd | 55.330773 | -160.501556 | $20,000,000 | | | | | | x | | x | x | x | x | x | x | | |
| 46 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Harbor Dock | Boat Harbor Rd | 55.330069 | -160.502449 | $20,000,000 | | | | | | x | | x | x | x | x | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Cargo Storage Area | Boat Harbor Rd | 55.330339 | -160.500958 | $50,000 | | | | | | x | | x | x | x | x | x | x | | |
| 48 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Humboldt Harbor Dock | Boat Harbor Rd | 55.328277 | -160.508622 | $20,000,000 | | | | | | x | | x | x | x | | x | x | | |
| 49 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Sand Point Ferry Dock | Boat Harbor Rd | 55.331166 | -160.505205 | $20,000,000 | | | | | | x | x | x | | x | x | x | x | | |
| 50 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | City Dock | Boat Harbor Rd | 55.331877 | -160.503971 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 51 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Sand Point DOT | 268 Airport Rd | 55.318571 | -160.520728 | $500,000 | | | | | | x | | x | x | x | x | x | x | | |
| 52 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Reeve Air Building | Airport Rd | 55.317597 | -160.519826 | $500,000 | | | | | | x | | x | x | x | x | x | x | | |
| 53 | Pauloff Harbor Tribe-Sand Point | Transportation | 20 | Aviation Terminal | Airport Rd | 55.317621 | -160.521373 | $1,000,000 | | | | | | x | | x | x | x | x | x | x | | |
| 54 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Airport Runway | Airport Rd | 55.318719 | -160.526886 | $50,000,000 | 5,213 x 150 ft pavement path | | | | | x | | x | x | x | x | x | x | | |
| 55 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | Small airplane storage SDP | Airport Rd | 55.316449 | -160.520386 | $5,000,000 | | | | | | x | | x | x | x | x | x | x | | |
| 56 | Pauloff Harbor Tribe-Sand Point | Transportation | 0 | SDP Heavy Duty Pier | Small Boat Harbor | 55.332938 | -160.49782 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 57 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | Landfill | Landfill Access Rd | 55.331253 | -160.429187 | $1,000,000 | | | | | | x | | | | x | | x | x | | |
| 58 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | Water Pump Station 1 | Nagai Ave | 55.349139 | -160.467973 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 59 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | Water Pump Station 2 | Nagai Ave | 55.350709 | -160.471488 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 60 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | City Water Tank | Red Cove Rd | 55.352531 | -160.475049 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 61 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | Sewage Treatment Plant | Kelly Ave | 55.355667 | -160.486484 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 62 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | Water Reservoir | Airport Rd | 55.340452 | -160.483747 | $5,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 63 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | City Pump House | Airport Rd | 55.341579 | -160.48573 | $500,000 | | | | | | x | | x | | x | x | x | x | x | |
| 64 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | TDX Wind Farm | 3004 Sand Point Ave | 55.343635 | -160.489 | $20,000,000 | | | | | | x | | x | | x | | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | Water Tank 1 | 3010 Sand Point Ave | 55.343239 | -160.490003 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 66 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | Water Tank 2 | 3016 Sand Point Ave | 55.342519 | -160.490712 | $5,000,000 | | | | | | x | | x | | x | | x | x | x | |
| 67 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | GCI Satellite Station | Sand Point ave | 55.342622 | -160.484268 | $20,000,000 | | | | | | x | | x | | x | | x | x | | |
| 68 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | Humboldt Creek Reservoir Dam | | 55.34129 | -160.48566 | $20,000,000 | Dam | City of Sand Point | | | | x | | x | | x | x | x | x | x | |
| 69 | Pauloff Harbor Tribe-Sand Point | Utilities | 0 | New England Fish Co Dam | | 55.31598 | -160.50875 | $20,000,000 | Dam | Shumagin Native Corporation | | | | x | | x | x | x | | x | x | x | |
| **Total Occupants:** | | | **1260** | **Total Estimated Value:** | | | | **$532,812,381** | | | | | | | | | | | | | | | |

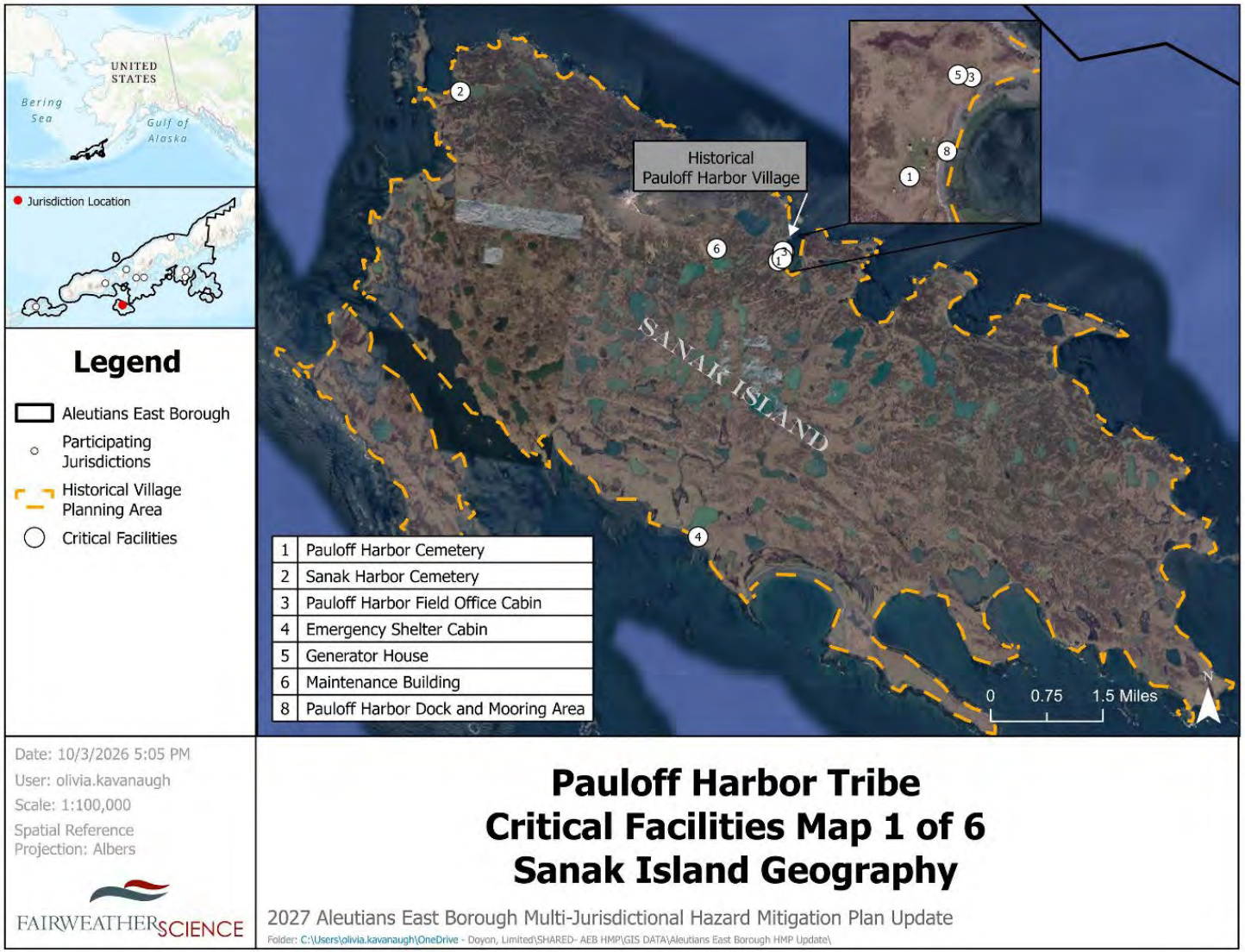



**Figure L-33- Pauloff Harbor Tribe Critical Facilities Map 1 of 6**

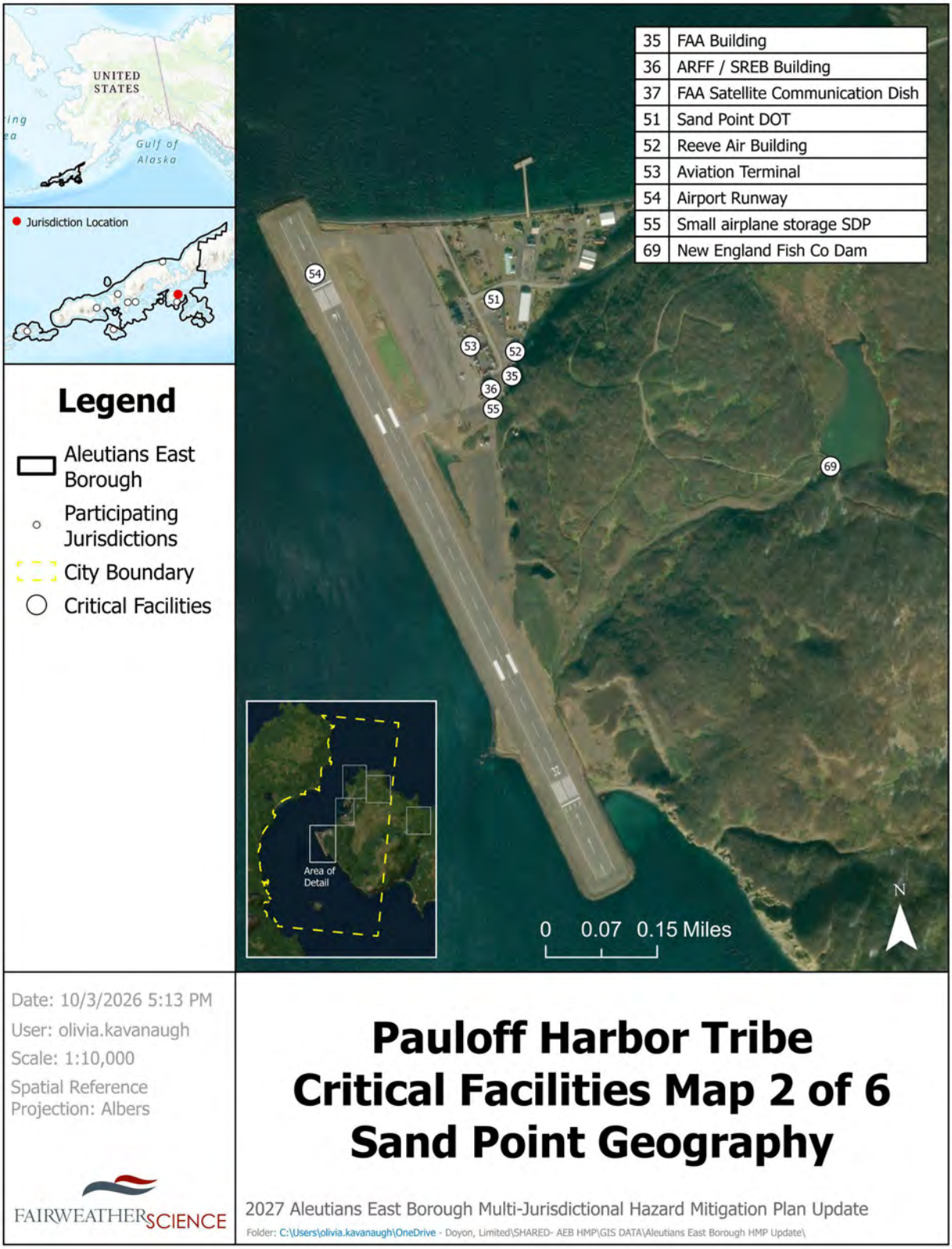



**Figure L-34- Pauloff Harbor Tribe Critical Facilities Map 2 of 6**

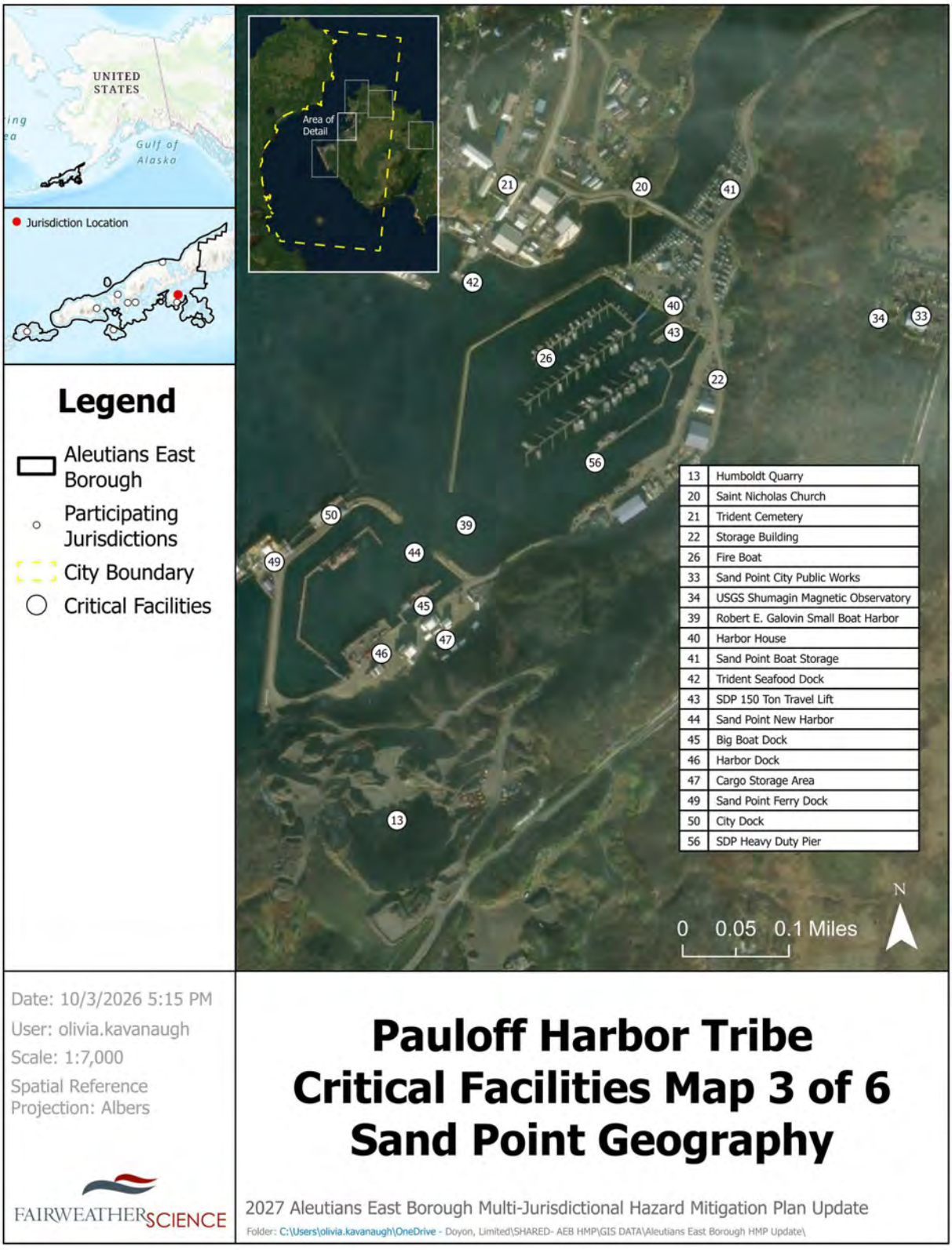



**Figure L-35- Pauloff Harbor Tribe Critical Facilities Map 3 of 6**

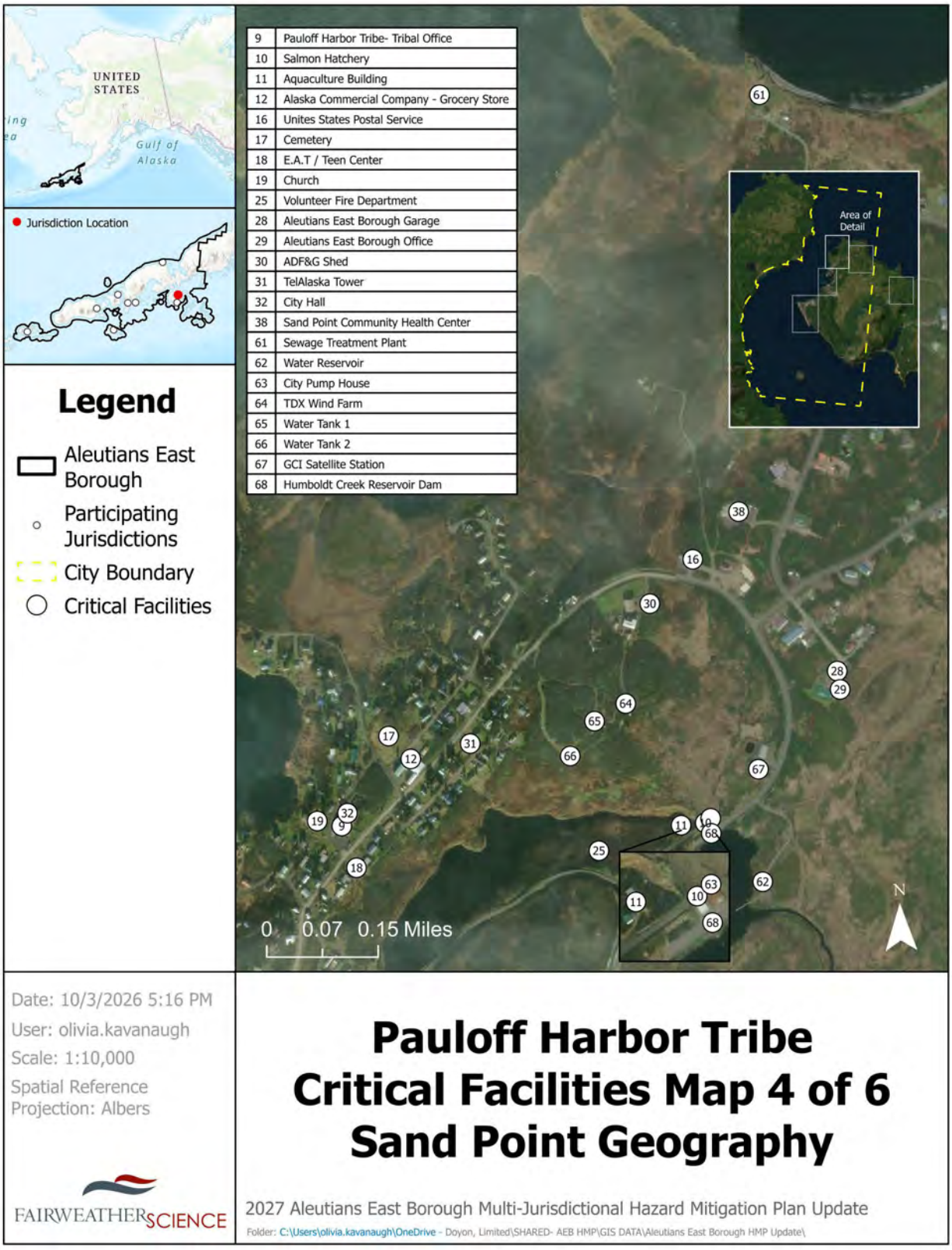



**Figure L-36- Pauloff Harbor Tribe Critical Facilities Map 4 of 6**

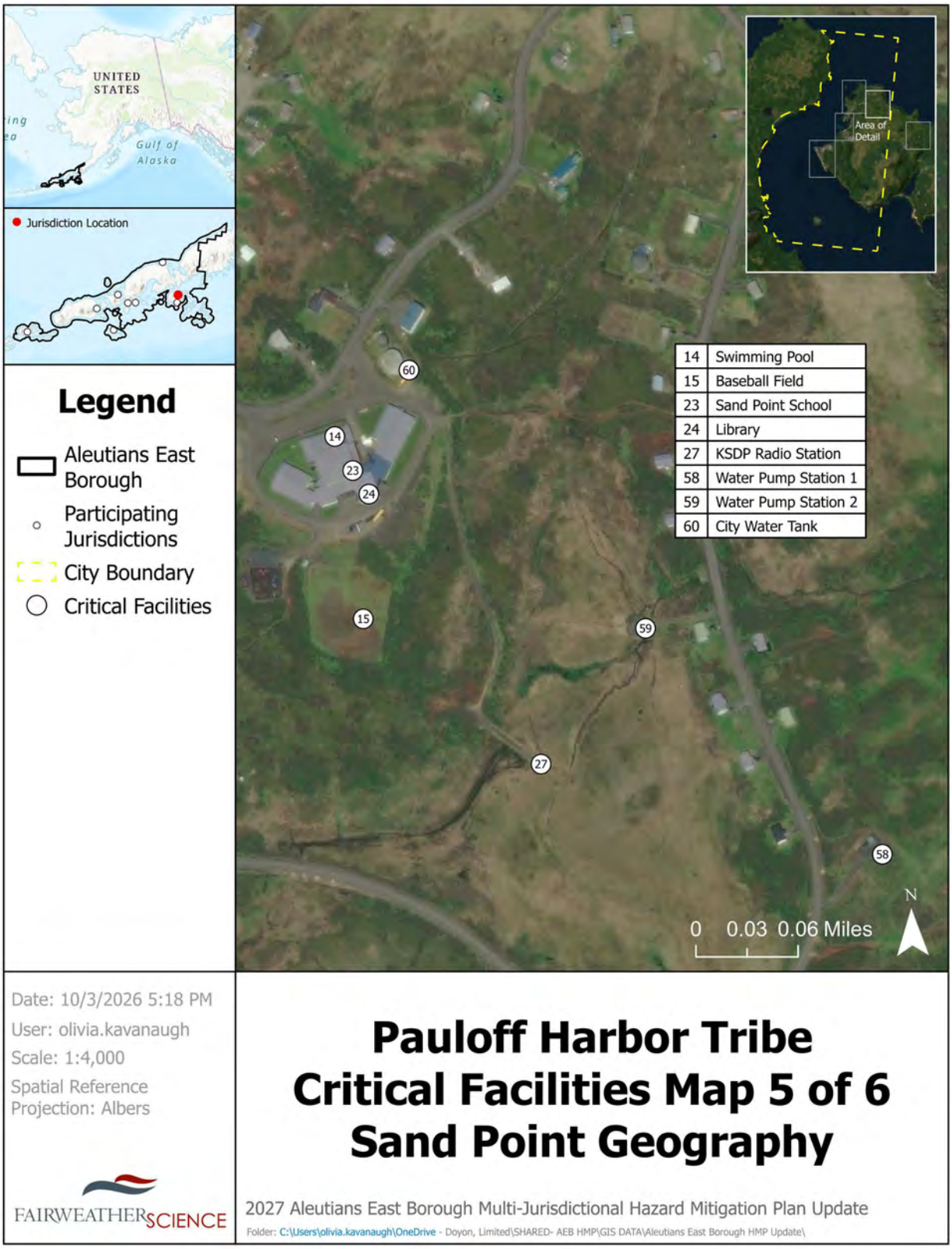



**Figure L-37- Pauloff Harbor Tribe Critical Facilities Map 5 of 6**

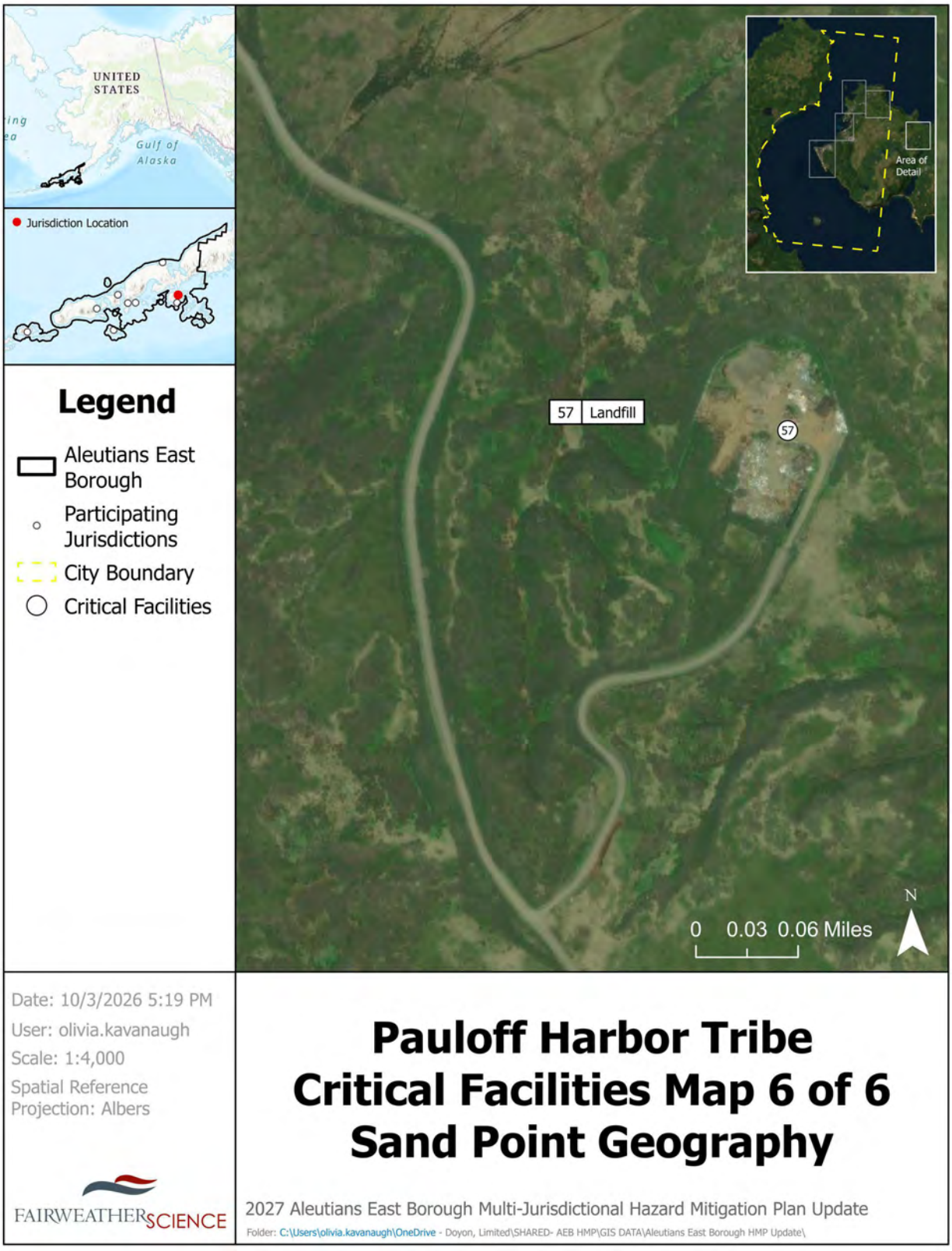



**Figure L-38- Pauloff Harbor Tribe Critical Facilities Map 6 of 6**

## L.4.3 Summary of Vulnerability

**Table L-8- Jurisdictional Summary of Vulnerability- Pauloff Harbor Tribe- Historical Village/Sanak Island**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere-Snow Avalanche | Did not profile this hazard | | | | | |
| Earthquake | 8 | 60 | $4,633,000 | N/A | N/A | N/A |
| Sediment Deterioration and Land Destabilization | 4 | 40 | $2,400,000 | N/A | N/A | N/A |
| Flood | 7 | 50 | $4,433,000 | N/A | N/A | N/A |
| Ground Failure/ Landslide | 2 | 20 | $1,200,000 | N/A | N/A | N/A |
| Severe Weather | 8 | 60 | $4,633,000 | N/A | N/A | N/A |
| Tsunami | 7 | 50 | $4,433,000 | N/A | N/A | N/A |
| Volcano | 8 | 60 | $4,633,000 | N/A | N/A | N/A |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | Did not profile this hazard | | | | | |
| Invasive Species | 0 | 0 | $0 | N/A | N/A | N/A |

The Pauloff Harbor Tribe's vulnerability extends beyond the permanent population and built facilities represented in the quantitative assessment above. Although the historic village is not occupied year-round, Tribal members continue to use Sanak Island and surrounding marine waters for subsistence, cultural, and traditional activities. Hazards that affect shoreline access, historic trails, culturally important places, subsistence areas, transportation to the island, or the resources harvested there may therefore affect the Tribe even when permanent residences or occupied facilities are not directly damaged.

**Table L-9- Jurisdictional Summary of Vulnerability- Pauloff Harbor Tribe- Sand Point**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | Did not profile this hazard | | | | | |
| Cryosphere-Snow Avalanche | Did not profile this hazard | | | | | |
| Earthquake | 61 | 1200 | $528,179,381 | 237 | 948 | $170,395,480 |
| Sediment Deterioration and Land Destabilization | 1 | 0 | $20,000,000 | 4 | 16 | $2,899,552 |
| Flood | 60 | 1200 | $527,179,381 | 236 | 944 | $169,670,592 |
| Ground Failure/ Landslide | 16 | 20 | $283,050,000 | 0 | 0 | $0 |
| Severe Weather | 61 | 1200 | $528,179,381 | 237 | 948 | $170,395,480 |
| Tsunami | 30 | 75 | $338,200,000 | 50 | 200 | $35,831,760 |
| Volcano | 61 | 1200 | $528,179,381 | 237 | 948 | $170,395,480 |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | 7 | 10 | $48,500,000 | 1 | 4 | $724,888 |
| Invasive Species | 0 | 0 | $0 | 0 | 0 | $0 |

## L.5 Capability Assessment

***Note: the Pauloff Harbor Tribe does not participate in the National Flood Insurance Program (NFIP).***

| Planning and Regulatory Tools | |
|---|---|
| **Plans** | **Existing?** |
| Comprehensive/ Master Plan | The Tribe does not currently have a comprehensive or master plan containing formal growth, development, and public safety policies. |
| Capital Improvements Plan | The Tribe does not have a formal capital improvements plan. Infrastructure needs are identified through tribal planning, grant applications, the EPA Tribal Environmental Plan, and council action. |
| Economic Development Plan | The Tribe participated in APIA's Regional Comprehensive Economic Development Strategy about 2017-2018. The regional planning process identified economic development needs, opportunities, infrastructure concerns, and strategies relevant to the Tribe and surrounding communities. Proposed development should be evaluated for exposure to erosion, flooding, severe weather, earthquakes, and other natural hazards. |
| Emergency Operations Plan or Small Community Emergency Operations Plan | Pauloff Harbor Tribe does not have an Emergency Operations Plan. Developing a plan has been identified as a tribal priority. |
| Transportation Plan | The Tribe participates in the BIA Tribal Transportation Program and maintains a transportation inventory. Proposed routes and projects include roads, barge landing, maintenance-facility access, and potential dock access. Hazard conditions are considered during project planning. |
| Housing Plan | Pauloff Harbor Tribe works with Aleutian Housing Authority on tribal housing needs and housing plans. Proposed housing projects are reviewed for site conditions and potential natural hazards before development. |
| Hazard-specific plans or studies | The Tribe is conducting erosion assessments on Sanak Island using GPS coordinates, photographs, field-observation forms, and repeat monitoring. Sites include Pauloff Harbor, Northeast Harbor, Johnson's, Unimak, Sandy Bay/Peterson Bay, and identified shoreline pinch points. |
| **Land Use Planning and Ordinances or Practices** | |
| **Ordinance/Practice** | **Existing?** |
| Zoning Ordinance | The Tribe does not have or enforce a zoning ordinance. Proposed tribal projects are reviewed individually for land ownership, environmental concerns, cultural resources, and natural hazards. |
| Subdivision Ordinance | The Tribe does not have a subdivision ordinance or subdivision -enforcement staff. |

| Land Use Planning and Ordinances or Practices | |
|---|---|
| **Ordinance/Practice** | **Existing?** |
| Building Codes | The Tribe does not maintain or enforce its own building code. Construction funded through federal or tribal programs must follow the codes and requirements applicable to that project. |
| Natural Hazard Specific Ordinance or Practices (Stormwater, Steep Slopes, Wildfire) | Although the Tribe does not have a formal natural-hazard ordinance, it uses project review, environmental assessments, erosion monitoring, site-safety planning, and tribal consultation to discourage development in unsafe or environmentally sensitive areas. |
| Acquisition of Land for Open Space and Public Recreation Uses | The Tribe does not currently have a dedicated funding source or formal policy for acquiring and preserving land in high-hazard areas. Land ownership and necessary permissions are reviewed before tribal projects proceeds. |
| Maintenance Programs to Reduce Risk, E.G., Tree Trimming, Clearing Drainage Systems | The Tribe conducts or supports beach and stream cleanups, debris removal, erosion monitoring, cemetery protection, and environmental field assessments. Funding is generally project-or-grant-based and is not guaranteed every year.<br>Funding: Tribal projects funding is primarily provided through grants and specific projects; therefore, funding levels and the activities that can be completed may vary from year to year. |
| Other | Tribal knowledge and consultation are used to identify and protect cemeteries, historic locations, subsistence-use areas, and culturally sensitive sites when projects are considered.<br>Tribal projects are reviewed for erosion, flooding, severe weather, contaminated sites, abandoned structures, military debris, and other environmental or safety concerns. |

| Administrative and Technical | |
|---|---|
| **Resource** | **Existing?** |
| Tribal Council/ Governing Body | The Pauloff Harbor Tribal Council reviews and approves policies, plans, projects, grants applications, and mitigation activities. |
| Tribal Chief Executive | The Tribal council President provides executive leadership and works with the Tribal Administrator to carry out council decisions |
| Mitigation Planning Committee | The Tribe participates in the regional hazard-mitigation planning process and provides local information about hazards, vulnerabilities, capabilities, and proposed projects. |
| Business Committees | The Tribe does not have a separate business committee responsible for hazard mitigation. The Tribal Council reviews economic-development and infrastructure matters. |
| Mutual Aid Agreements | The Tribe works cooperatively with regional and local organizations during projects and emergencies. |
| Code Inspector | No, contracted support can be utilized. |

| Administrative and Technical | |
|---|---|
| **Resource** | **Existing?** |
| Environmental/Natural Resources Specialist | No, contracted support can be utilized. |
| Emergency Manager | No, contracted support can be utilized. |
| Community Planner | No, contracted support can be utilized. |
| Housing Specialist | Yes through Aleutian Housing Authority. |
| Engineer | No, contracted support can be utilized. |
| Other | Sanak Island is remote and generally accessible by boat. Severe weather, travel distance, vessel availability, fuel costs, and communications can delay assessments and emergency response. |
| Historian/ Cultural Advisor | Tribal members and cultural staff provide knowledge about historic places, cemeteries, subsistence areas, former village sites, and culturally sensitive locations. Documentation should continue. |
| Financial or Grants Specialist | Yes |
| Administrative Staff Person | Yes |
| Other- IGAP Coordinator | Yes The Tribe conducts erosion, beach, stream, debris, and environmental observations. Continued training, equipment, and reliable transportation are needed. |
| Warning Systems/ Services | The Tribe receives weather, tsunami, earthquake, and other emergency information from outside agencies. There is a local tsunami siren what needs updating/repairs. Local communications and procedures for distributing warnings should be strengthened. |
| Hazard Data/Information | Information is obtained from federal, state, borough, regional, and tribal sources. The Tribe also collects GPS coordinates, photographs, erosion observations, and environmental field data on Sanak Island. |
| Grant Writing | The Tribal administrator prepares and coordinates grant applications. Additional technical assistance is needed for complex hazard-mitigation and infrastructure grants. |
| Geographic Information Systems (GIS) Analysis | The Tribe collects GPS and photographic information but has limited in-house GIS staffing and software capacity. The Tribal administrator took a beginner's course in GIS. |
| **Financial** | |
| **Resource** | **Existing?** |
| Capital Improvements Project Funding | The Tribe may seek capital-project funding through federal, state, regional, and tribal programs. Funding is competitive and generally required project planning, cost estimates, environmental review, and matching funds when applicable. |
| Gaming Revenue, Enterprise Revenues | The Tribe receives gaming-related revenue. Use of these funds is subject to approved tribal budgets, council authorization, and applicable restrictions. Limited funds may |

| Financial | |
|---|---|
| **Resource** | **Existing?** |
| | be available for planning, emergency needs, matching funds, or mitigation projects. |
| Fees For Water, Sewer, Gas, or Electric Services | No |
| Fees From Festivals, Campsites, and Recreational Areas | No |
| Permits and Other Fees | No |
| Federal Funding (BIA, HUD) | The Tribe is eligible to seek federal funding through programs such as BIA and HUD. The Tribe also works with the Aleutian Housing Authority on housing needs and planning. Funding depends on program availability and eligibility requirements. |
| Contract Services | The Tribe may hire engineers, planners, environmental specialists, GIS technicians, and other contractors when grant or tribal funding is available. |
| EPA IGAP | EPA IGAP Funding supports environmental planning, staff capacity, public outreach, erosion monitoring, field assessments, solid-waste planning, and other environmental activities. IGAP generally supports capacity-building rather than construction. |
| FEMA Hazard Mitigation Funding | The Tribe may seek FEMA or other emergency-management funding for eligible planning and mitigation projects. Applications may require detailed project information, technical studies, cost estimates, and benefit cost documentation. |
| Other State, Regional Grants | The Tribe may pursue funding through state and federal agencies and regional partners for transportation, emergency planning, erosion, housing, environmental protection, communications, and infrastructure projects. |

| Education and Outreach | |
|---|---|
| **Program/Organization** | **Existing?** |
| Gatherings, Festivals, Celebrations and/or Meetings | The Tribe shares information during Tribal Council meetings, community meetings, workshops, and local events. Shortcomings include limited attendance, scheduling conflicts, and difficulty reaching members who live outside the community. Information can also be provided by mail, email, phone, social media, radio, and printed notices. |
| Natural Disaster or Safety- Related School Programs | The Tribe does not currently operate a regular school-based natural-hazard education program. The Tribe can coordinate with the Sand Point School, Head Start, APIA, the Aleutians East Borough, and emergency-response organizations to provide earthquake, tsunami, severe-weather, evacuation, and emergency preparedness education. |
| Fire Safety Programs | The Tribe distributed fire-safety and emergency preparedness equipment to tribal-member households. Items included fire extinguishers, fire blankets, smoke alarms, replacement batteries, emergency radios, lanterns, and other safety supplies. Fire-safety literature and |

| Education and Outreach | |
|---|---|
| **Program/Organization** | **Existing?** |
| | instructions were provided with the equipment. Future outreach could include replacement schedules, equipment checks, and additional fire-safety education. |
| Other: Tribal Communications | The Tribe uses notices, phone calls, email, social media, radio announcements, surveys, and direct outreach to provide information to tribal members and the community. |
| Other: Environmental Education and Outreach | Through EPA IGAP and other projects, the Tribe provides education about erosion, beach and stream cleanup, recycling, backhaul, composting, hazardous waste, and protection of natural resources. |
| Other: Emergency preparedness outreach | The Tribe would like to expand education concerning emergency supplies, family communication plans, evacuation procedures, tsunami and earthquake response, severe weather, and marine-travel safety. |
| Other: Cultural and Traditional Knowledge | Elders, Tribal members, and cultural staff provide knowledge about local hazards, historic events, subsistence areas, traditional travel practices, cultural sites, and environmental changes. This knowledge can strengthen hazard planning and public education. |

The Tribe's continuing knowledge and use of Sanak Island provide place-based information relevant to hazard identification and vulnerability assessment. Community observations regarding sea ice, earthquakes, shoreline conditions, invasive species, severe weather, and other environmental conditions can complement technical information in a geography where year-round monitoring and formal hazard mapping are limited. Continued Tribal involvement in documenting and interpreting these conditions is therefore an important planning capability.

# L.6 Mitigation Strategy

## L.6.1 Mitigation Goals

The Pauloff Harbor Tribe has identified its goals related to hazard mitigation as:

1. Reduce coastal erosion impacts to protect cultural resources, trails, and critical infrastructure on Sanak Island.
2. Improve emergency access and transportation by restoring the Pauloff Harbor dock and mooring area.
3. Protect subsistence resources and access by reducing impacts from erosion, severe storms and climate change.
4. Increase community resilience through hazard planning, public education, emergency preparedness, and climate adaptation.
5. Protect critical tribal facilities and cultural resources, including the field office, storage buildings, historic trails, cemeteries, and environmental monitoring sites.
6. Improve hazard monitoring and data collection through continued shoreline monitoring, GPS mapping, and environmental assessments.
7. Strengthen emergency communications and response capabilities for Sanak Island operations and remote field activities.

## L.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

This is the first edition of the Pauloff Harbor Tribe's HMP. As such, they were not a participating jurisdiction in the 2021 AEB HMP.

## L.6.3 2027 Mitigation Action Plan

**Table L-10- 2027 Mitigation Action Plan- Pauloff Harbor Tribe**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In | Project Geography: Sand Point | Project Geography: Pauloff Harbor Village/Sanak Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | All Hazard | Evaluate and select projects that can increase the resilience of the water supply on Sanak Island to hazard events. | H | Tribal Administrator | USDA, BIA, EPA, HMA | Plans and Regulations | All Sanak Island Critical Infrastructure | 0-2 years | B/C: Supports reliable drinking water; costs include engineering, upgrades, operation and maintenance. TF: Phased design and implementation. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **2** | All Hazards | Develop or update the Tribe's Emergency Response/Emergency Operations Plan. Address earthquakes, tsunamis, severe storms, coastal flooding, erosion, wildfires, marine emergencies, evacuations, communications, and sheltering. | H | Tribal Council | HMA, EMPG, BIA, Denali Commission, Alaska DHS&EM | Plans and Regulations | All Critical Infrastructure | 0-2 years | B/C: A comprehensive EOP reduces disaster impacts and improves coordination during emergencies. TF: This project is technically feasible using existing planning frameworks and tribal input. | Existing plans: Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | x |
| **3** | All Hazards | Find funding to improve the cabin on Sanak Island (owned by Sanak Corporation and used by the Tribe since 2023) so that it can withstand hazard events and be used as an emergency shelter. | H | Tribal Administrator | HMA, Denali Commission, AHFC, BIA, HUD | Structure and Infrastructure Projects | Sanak Island Cabin | 0-2 years | B/C: Strengthening the cabin reduces evacuation risk and avoids costly emergency sheltering during disasters. TF: This project is technically feasible using standard building improvements and phased work. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **4** | All Hazards | Improve Emergency communications and warning capabilities. Obtain or upgrade satellite communications, VHF radios, emergency radios, charging equipment, backup power, and procedures for contacting people during emergencies. | H | Tribal Administrator | THSGP, DHS, HMA, NOAA, Alaska DHS&EM | Other | All Critical Infrastructure | 0-2 years | B/C: Enhanced communication reduces response delays and associated emergency costs. TF: This project is technically feasible with commercially available equipment and training. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | x |
| **5** | All Hazards | Reestablish a safe dock or mooring facility at Pauloff Harbor. Conduct engineering and environmental review and develop a facility that improves safe access, evacuation, emergency response, and delivery of supplies during severe weather. | H | Tribal Administrator | USDOT, MARAD, HMA, USACE, NOAA, Denali Commission, Alaska DOT, BIA TTP | Structure and Infrastructure Projects | Pauloff Harbor | 0-2 years | B/C: A safe dock improves emergency access and reduces hazardous conditions for mariners and responders. TF: This project is technically feasible with engineering review and phased construction. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In | Project Geography: Sand Point | Project Geography: Pauloff Harbor Village/Sanak Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **6** | All Hazards | Assess and reduce hazards from deteriorated and abandoned structures on Sanak Island. Inventory unsafe buildings and debris, restrict access, and pursue funding for stabilization or removal. | M | Tribal Administrator | Tribe, HMA, EPA IGAP, NOAA, Denali Commission, DHS&EM, BIA | Structure and Infrastructure Projects | Sanak Island structures | 3-4 years | B/C: Addressing unsafe structures reduces injury risk and future cleanup costs. TF: This project is technically feasible with site inventory and contracted removal or stabilization. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **7** | Dam Failure | Support formal dam failure inundation mapping for Humboldt Creek Reservoir Dam and New England Fish Co Dam. | H | Tribal Administrator | FEMA HHPD, USACE, HMA | Other | Humboldt Creek Reservoir Dam, New England Fish CO Dam | 0-2 years | B/C: Benefits include life safety and targeted downstream mitigation; costs include hydrologic/hydraulic modeling, GIS production, and QA/QC. TF: Phasing in coordination with the City. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **8** | Dam Failure | Support efforts to fix and strengthen both dams - to include addressing culvert damage and a crack in the earthen embankment at Humboldt Creek Reservoir Dam and seepage issues at New England Fish Co Dam - to ensure that the dam can withstand future climate conditions such as a predicted increase in annual precipitation as well as seismic events. | H | Tribal Council | FEMA HHPD, USACE, HMA | Structure and Infrastructure Projects | Humboldt Creek Reservoir Dam, New England Fish CO Dam | 0-2 years | B/C: Benefits include catastrophic loss avoidance and protected infrastructure; costs include geotech investigations, engineering design, construction, and monitoring. TF: Phasing required for assessment/scoping, engineering, construction, monitoring. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **9** | Earthquake | Support identification of buildings and facilities that must be able to remain operable during and following an earthquake event in Sand Point | H | Tribal Administrator and Tribal Council | HMA, HUD, USGS | Structure and Infrastructure Projects | All Critical Infrastructure | 0-2 years | B/C: Benefits include life safety and continuity of essential services by prioritizing retrofits for critical facilities; costs include staff time, field surveys, GIS, and consultant screening. TF: Collaborate with City for phasing. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **10** | Earthquake | Identify buildings and facilities that must be able to remain operable following an earthquake event that are owned by the Tribe and/or located on Sanak Island | H | Tribal Administrator and Tribal Council | HMA, HUD, USGS, BIA | Structure and Infrastructure Projects | All Sanak Island Critical Infrastructure | 0-2 years | B/C: Benefits include targeted investments in tribal and island assets to ensure operability post-quake; costs include travel/logistics to Sanak, surveys, and consultant support. TF: Feasible using a structured inventory and screening protocol; weather-dependent field work. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **11** | Earthquake | Support the hardening of the water and sewer system to | H | Tribal Administrator and Tribal Council | USACE, HMA, Denali | Structure and Infrastructure Projects | Utilities | 0-2 years | B/C: Benefits include avoided outages, boil notices, and emergency hauling; costs | Existing plans: Tribal Economic Development Plan, Long-Range Transportation | x | |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In | Project Geography: Sand Point | Project Geography: Pauloff Harbor Village/Sanak Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | be more resilient against seismic events | | | Commission, ANTHC | | | | may be high depending on design & engineering. TF: Phasing of assessment, engineering, implementation. | Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | |
| **12** | Earthquake | Retrofit any critical facilities or culturally significant structures on Sanak Island to be more seismically resilient | H | Tribal Council | HMA, BIA, Denali Commission, USGS | Structure and Infrastructure Projects | All Sanak Island Critical Infrastructure | 5-10 years | B/C: Life safety benefits and preservation of cultural assets; Costs higher in remote relocations for assessment and construction. TF: Phasing based on facility prioritization. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **13** | Earthquake | Support seismic retrofitting at the Sand Point harbor/dock area, because earthquake damage has occurred there | H | Tribal Council | MARAD, HMA, EDA Public Works, USACE | Structure and Infrastructure Projects | All harbor/dock infrastructure | 0-2 years | B/C: Benefits include safe moorage, economic continuity and emergency access; geotechnical, permitting, construction, etc. may be costly. TF: Phased assessment and implementation. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | x |
| **14** | Flood | Support efforts to protect the airport runway from coastal flooding/storm surge/king tide, such as a sea wall | H | Tribal Council | BIA, HMA, USACE, DOT, Denali Commission | Structure and Infrastructure Projects | Airport runway | 0-2 years | B/C: Flood protection reduces runway closure, repair costs, and emergency access interruptions. TF: This project is technically feasible with engineered flood and shoreline protection methods. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **15** | Flood | Support efforts to mitigate the impact of high tides on the Harbor Road. | M | Tribal Administrator | BIA, HMA, USACE, DOT, Denali Commission | Structure and Infrastructure Projects | Harbor Road | 3-4 years | B/C: Reducing tidal impacts prevents road damage and costly closures. TF: This project is technically feasible using drainage and minor elevation improvements. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **16** | Flood | Consider strategies, and the feasibility of these strategies, to protect boats in the event of high tide and other coastal flooding events. | M | Tribal Council | Tribe, NOAA, DHS&EM | Other | Marine transportation infrastructure | 3-4 years | B/C: Protective measures reduce vessel damage and emergency retrieval costs. TF: This project is technically feasible with standard moorage and other techniques. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **17** | Flood | Investigate historic flood impacts on Sanak Island to determine if any critical facilities or culturally | H | Tribal Administrator | FEMA RiskMAP, USACE, BIA Tribal Resilience, ANTHC, ANA | Other | All Sanak Island Critical Infrastructure | 3-4 years | B/C: Understanding past flood impacts reduces future losses and guides cost-effective mitigation. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific | | x |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In | Project Geography: Sand Point | Project Geography: Pauloff Harbor Village/Sanak Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | significant sites are at risk to flooding. | | | Environmental & Cultural Grants | | | | TF: This project is technically feasible with simple research and mapping. | Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | |
| **18** | Invasive Species | Support the establishment of a marine cargo/vessel inspection station to ensure no new invasive species are introduced. | M | Tribal Administrator | USFWS, US Coast Guard, NOAA, EPA IGAP, ADF&G, BIA | Structure and Infrastructure Projects | All marine transportation infrastructure | 3-4 years | B/C: Inspections prevent new invasive species introductions, reducing long-term control costs. TF: This project is technically feasible using existing inspection processes. | Existing plans: Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **19** | Invasive Species | Set crab traps along coast of Sanak Island to monitor European crab populations and remove them from the ecosystem to prevent further proliferation | M | Tribal Council | USFWS, NOAA, ASF&G, BIA | Other | All Sanak Island Critical Infrastructure | 3-4 years | B/C: Monitoring reduces crab spread and avoids future ecological and economic impacts. TF: This project is technically feasible using standard trapping and monitoring methods. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **20** | Invasive Species | Consider the feasibility and scope of establishing a community-based monitoring program for invasive plants, including orange hawkweed, oxeye daisies, and creeping buttercups. | H | Tribal Council | USDA, USFS, USFWS, EPA IGAP, Alaska DNR, BIA Tribal Resilience | Other | All Critical Infrastructure | 0-2 years | B/C: Community monitoring identifies invasive plants early, reducing future removal costs. TF: This project is technically feasible with simple field training and reporting tools. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **21** | Invasive Species | Develop strategies to prevent the spread of invasive plants to Sanak Island, such as outreach materials or purchasing four wheelers for Sanak Island to reduce the possibility of invasive species spread. This could also reduce hazard risk from severe weather events. | H | Tribal Council | USDA, USFS, USFWS, EPA IGAP, Alaska DNR, BIA Tribal Resilience | Education and Awareness Programs | All Sanak Island Critical Infrastructure | 0-2 years | B/C: Prevention reduces future eradication costs and limits ecological damage. TF: This project is technically feasible through education and improved access logistics. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **22** | Invasive Species | Evaluate and implement strategies to mitigate the proliferation of invasive plant species such as orange hawkweed. | H | Tribal Administrator | USDA, USFS, USFWS, EPA IGAP, Alaska DNR, BIA Tribal Resilience | Natural Systems Protection | All Critical Infrastructure | 0-2 years | B/C: Early mitigation reduces long-term removal and restoration costs. TF: This project is technically feasible with coordinated treatment and follow-up monitoring. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In | Project Geography: Sand Point | Project Geography: Pauloff Harbor Village/Sanak Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **23** | Invasive Species | Support education and outreach materials to distribute to residents about invasive plants, how to recognize them, and how to remove them. | M | Tribal Council | USDA, USFS, USFWS, EPA IGAP, Alaska DNR, BIA Tribal Resilience, APIA, Tribe | Education and Awareness Programs | All Critical Infrastructure | 0-2 years | B/C: Education reduces plant spread and lowers future ecosystem restoration costs. TF: This project is technically feasible using existing communication platforms. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | x |
| **24** | Landslide | Conduct historical landslide inventory to better understand hazard risk in Sand Point, and where to focus future mitigation actions | M | Tribal Council | USGS, HMA, Alaska DGGS, DHS&EM, University of Alaska | Other | All Sand Point Critical Infrastructure | 3-4 years | B/C: A landslide inventory identifies risk areas and reduces future losses through better planning. TF: This project is technically feasible using mapping and local field verification. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **25** | Landslide | Conduct historical landslide inventory to better understand hazard risk on Sanak Island, and where to focus future mitigation actions | M | Tribal Council | USGS, HMA, Alaska DGGS, DHS&EM, University of Alaska | Other | All Sanak Island Critical Infrastructure | 3-4 years | B/C: Inventorying past landslides supports safer development and minimizes future damage costs. TF: This project is technically feasible using low-cost mapping and observation methods. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **26** | Landslide | Conduct landslide mapping for Sand Point and Pauloff Harbor Village/Sanak Island to better understand hazard risk and where to focus future mitigation actions. | M | Tribal Administrator | USGS, DHS&EM, Alaska DGGS, FMA, ANTHC | Other | All Critical Infrastructure | 5-10 years | B/C: Benefits include detailed hazard zones for planning and retrofits; costs include remote sensing, geotech screening, and GIS production. TF: Scoping of geographic extent needed. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | x |
| **27** | Sediment Deterioration and Land Destabilization | Complete a Sanak Island erosion assessment and monitoring program. Continue to monitor active erosion at multiple locations on Sanak Island, to include but not be limited to Pauloff Harbor, Northeast Harbor, Johnson's, Unimak Cove, and the Sandy/Pederson Bay dune area, and evaluate strategies to mitigate erosion. Monitor areas for erosion for areas outside of these sites and evaluate strategies to mitigate erosion at these areas. | H | Tribal Administrator, Tribal Council | NOAA, BIA, HMA, USGS, USACE, ANTHC, State of Alaska | Other | All Sanak Island Critical Infrastructure | 0-2 years | B/C: Regular monitoring identifies risks early and reduces long-term damage and relocation costs. TF: This project is technically feasible using surveys and standard monitoring methods. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In | Project Geography: Sand Point | Project Geography: Pauloff Harbor Village/Sanak Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **28** | Sediment Deterioration and Land Destabilization | Develop an erosion-control and shoreline-protection plan for priority Sanak Island sites. Use the assessment results to evaluate stabilization, relocation, drainage improvements, vegetation, or other protective measures. | M | Tribal Administrator | NOAA, BIA, HMA, USGS, USACE, ANTHC | Plans and Regulations | All Sanak Island Critical Infrastructure | 3-4 years | B/C: A formal plan reduces future erosion damage and guides cost-effective mitigation actions. TF: This project is technically feasible with engineering analysis and community consultation. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **29** | Sediment Deterioration and Land Destabilization | Pursue funding for erosion solutions based on studies, assessments, and monitoring. | H | Tribal Administrator | NOAA, BIA, HMA, USGS, USACE, ANTHC | Structure and Infrastructure Projects | All Critical Infrastructure | 5-10 years | B/C: Securing funding enables long-term protection of vulnerable areas, reducing future damage costs. TF: This project is technically feasible by developing proposals based on completed assessments. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **30** | Sediment Deterioration and Land Destabilization | Support efforts to mitigate erosion that threatens the airport runway. | H | Tribal Administrator | NOAA, BIA, HMA, USGS, USACE, ANTHC, State of Alaska | Structure and Infrastructure Projects | Airport runway | 0-2 years | B/C: Protecting the runway prevents costly repairs and ensures safe access during emergencies. TF: This project is technically feasible using standard coastal and drainage stabilization measures. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **31** | Sediment Deterioration and Land Destabilization | Conduct visual inspection of coastline and creek beds in Pauloff Harbor to determine erosion risk near Critical Facilities on traditional lands | H | Tribal Administrator | Tribe, NOAA, BIA, HMA, USGS | Other | All Sanak Island Critical Infrastructure | 0-2 years | B/C: Regular inspections identify erosion risks early and prevent expensive emergency repairs. TF: This project is technically feasible through routine field visits and simple documentation. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **32** | Sediment Deterioration and Land Destabilization | Identify alternate route on Sanak Island to continue to be able to access the beach. The trail was lost to sediment deterioration. | M | Tribal Administrator | Tribe, HMA, USACE | Other | None | 5-10 years | B/C: Establishing an alternate route ensures continued access and avoids unsafe travel conditions. TF: This project is technically feasible with field scouting and minor trail improvements. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **33** | Severe Weather | Conduct special awareness activities, such as Winter Weather Awareness Week | M | Tribal Administrator | Tribe, HMA, Alaska DHS&EM, NOAA/NWS E&O, American Red Cross, APIA | Education and Awareness Programs | All Critical Infrastructure | 3-4 years | B/C: Seasonal awareness activities can reduce injuries, storm damage, and emergency response costs. TF: This project is technically feasible using existing communication tools and community partnerships. | Existing plans: Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | x |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In | Project Geography: Sand Point | Project Geography: Pauloff Harbor Village/Sanak Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **34** | Severe Weather | Support the installation of backup metal roofing and triple pane windows in all critical facilities in Sand Point (owned by the City) to reduce risk of structure damage due to heavy rain/snow and high winds | H | Tribal Administrator | HMA, BIA, EPA, ANTHC, Denali Commission | Structure and Infrastructure Projects | All Sand Point Critical Infrastructure | 0-2 years | B/C: Strengthening facilities reduces weather-related damage and long-term repair costs.<br>TF: This project is technically feasible using standard building materials and contractors. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **35** | Severe Weather | For tribally owned critical facilities, lead the installation of backup metal roofing and triple pane windows in all critical facilities in Sand Point to reduce risk of structure damage due to heavy rain/snow and high winds | H | Tribal Council | HMA, BIA, EPA, ANTHC, Denali Commission | Structure and Infrastructure Projects | All tribally owned critical infrastructure | 0-2 years | B/C: These upgrades protect tribal facilities and reduce future structural damage costs.<br>TF: This project is technically feasible through typical construction methods and tribal project management. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **36** | Severe Weather | Evaluate the feasibility of and consider constructing weather station on Sanak Island to better realize risk of severe weather in traditional lands, and provide more response time to severe weather events. Severe weather can delay/prevent access to traditional subsistence areas on and around Sanak Island. | H | Tribal Council | NOAA, NWS, HMA, State of Alaska, University of Alaska | Other | Sanak Island Weather Station (Potential) | 0-2 years | B/C: A local weather station improves early warning, reducing safety risks and economic losses from storms.<br>TF: This project is technically feasible with modern remote-monitoring equipment and partner support. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **37** | Severe Weather | Safety of boats off Sanak Island is a concern. Consider better, more protected moorage areas in the harbor. | H | Tribal Administrator and Environmental Advisory Committee | HMA, USACE, NOAA, | Structure and Infrastructure Projects | Sanak Island harbor | | B/C: Better moorage reduces vessel loss, recovery costs, and risks to mariners during severe weather.<br>TF: This project is technically feasible with harbor assessment and small-scale infrastructure upgrades. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **38** | Tsunami | Consider participation in the Tsunami Awareness Program | H | Tribal Administrator and Tribal Council | Tribe, NOAA, HMA, BIA | Education and Awareness Programs | None | 0-2 years | B/C: Low-cost preparedness improvement.<br>TF: Phased funding likely not required. | Existing plans: Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | x |
| **39** | Tsunami | Support evaluation of how the existing tsunami siren is functioning and install an additional tsunami siren, if needed | H | Tribal Administrator and Tribal Council | Tribe, NOAA Tsunami Program, HMA, BIA Tribal Preparedness | Other | Tsunami Sirens | 0-2 years | B/C: Sirens significantly improve warning dissemination and evacuation success.<br>TF: Medium timeline for system procurement, installation, and testing. | Existing plans: Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In | Project Geography: Sand Point | Project Geography: Pauloff Harbor Village/Sanak Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **40** | Tsunami | Procure tsunami inundation mapping of Sanak Island/Pauloff Harbor to determine if any critical infrastructure is at risk of tsunami impacts | M | Tribal Administrator and Tribal Council | HMA, NOAA, BIA, USACE | Other | All Sanak Island Critical Infrastructure | 3-4 years | B/C: Mapping can improve life and property safety and strategically direct mitigation efforts.<br>TF: Field seasons on Sanak weather and resource-dependent. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **41** | Volcano | Support the evaluation of the water treatment plant to ensure that ashfall cannot enter the system | H | Tribal Administrator and Tribal Council | Tribe, EPA, FEMA HMA, USGS Volcano Hazards | Other | Water treatment plant | 0-2 years | B/C: Prevents contamination; avoids expensive shutdowns.<br>TF: Potential to implement low-cost improvements. Phasing needed for assessment and implementation. | Existing plans: Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |
| **42** | Volcano | Fund education and outreach efforts related to volcanic ashfall, to possibly include "kits" with protective materials, masks, air filters, etc. | H | Tribal Administrator and Tribal Council | Tribe, USGS, BIA Tribal Resilience, HMA | Education and Awareness Programs | All Critical Infrastructure | 0-2 years | B/C: Education and ashfall kits can reduce health impacts and costly emergency response needs during ashfall events.<br>TF: This project is technically feasible using existing outreach methods and sourced protective materials. | Existing plans: Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | x |
| **43** | Volcano | Ensure that the Sanak Island cabin is stocked with a volcanic ashfall kit and other necessary emergency supplies. | H | Tribal Administrator and Tribal Council | Tribe, USGS, BIA Tribal Resilience, HMA | Other | Sanak Island Cabin | 0-2 years | B/C: Maintaining emergency supplies at the cabin reduces evacuation risks and costly emergency transport during ashfall.<br>TF: This project is technically feasible with regular resupply and basic storage management. | Existing plans: Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | | x |
| **44** | Wildfire | Evaluate firefighting capacity and improve this capacity (through equipment, training, etc.). | M | Tribal Council | THSGP, EMPH, USDA, DHS&EM | Other | Fire Dept Infrastructure | 5-10 years | B/C: Benefits include reduced fire losses and improved response; costs include equipment purchase, training, maintenance, and certifications.<br>TF: Feasible with training plan and appropriate scoping. | Existing plans: Tribal Economic Development Plan, Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | x |
| **45** | Wildfire | Support education efforts about wildfire risk and how to mitigate it. | M | Tribal Administrator | EMPG, USFS/USFWS, APIA, Tribe | Education and Awareness Programs | All Critical Infrastructure | 5-10 years | B/C: Education can reduce/prevent ignition for relatively low cost.<br>TF: Feasible with standard public education programming. Staff time and materials needed. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan<br>Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | x |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In | Project Geography: Sand Point | Project Geography: Pauloff Harbor Village/Sanak Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **46** | Wildfire | Expand household emergency-preparedness and fire-safety assistance. Continue distributing smoke alarms, batteries, fire extinguishers, fire blankets, emergency radios, lanterns, preparedness literature, and other emergency supplies to tribal members households. | M | Tribal Council | EMPG, DHS&EM, BIA, ANTHC | Education and Awareness Programs | All Critical Infrastructure | 0-2 years | B/C: Life safety and recovery benefits for relative low cost. TF: Procurement and distribution planning needed. | Existing plans: Tribal Economic Development Plan, Long-Range Transportation Plan, Housing Plan, Hazard-specific Plans/Studies, EPA Environmental Plan Future plans: Comprehensive Plan, Strategic Management Plan, EOP/SCERP | x | |

### L.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Install an additional tsunami siren to mitigate human injuries and fatalities during a tsunami event. | Not a priority at this time. |
| Update, as needed, emergency notification procedures and emergency planning for ashfall events. | Not a priority at this time. |

# L.7 Plan Update

## L.7.1 Changes in Development, including in Hazard-Prone Areas (current and future)

### L.7.1.1 Changes in Development

This MJHMP is the first analysis for the Pauloff Harbor Tribe. It is reported there has been little development in Sand Point between 2021 and 2026, and the City's overall vulnerability to natural hazards has not significantly changed.

### L.7.1.2 Future/Planned Development

There is no planned development on Sanak Island. The City of Sand Point has no planned or anticipated future development projects within the community.

## L.7.2 Changes in Priorities and Mitigation Efforts

This MJHMP is the first analysis for the Pauloff Harbor Tribe.

# L.8 Plan Maintenance

## L.8.1 Planning Team MJHMP Maintenance Commitment

The Pauloff Harbor Tribe is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.7.

The Pauloff Harbor Tribe is committed to annually reviewing the Plan and Tribal staff will work to complete their review responsibilities.

## L.8.2 Continued Public Involvement

The Pauloff Harbor Tribe is dedicated to continued public involvement over the next five years.

The Pauloff Harbor Tribe will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2032.

Future engagement should also provide opportunities for Tribal citizens and other community knowledge holders to identify new local observations, environmental changes, subsistence-related impacts, traditional access concerns, and other knowledge relevant to hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where Indigenous Knowledge or other community-provided information is considered for incorporation into the MJHMP, appropriate attention should be given to Tribal review, attribution, sensitivity, and preferences regarding public disclosure.

## L.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The Pauloff Harbor Tribe jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The Tribal Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### L.8.3.1.1 Implementing

Upon adoption of the Plan, the Pauloff Harbor Tribe will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The Pauloff Harbor Tribe will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### L.8.3.1.2 Monitoring

The Pauloff Harbor Tribe will monitor the progress of mitigation actions on an annual basis. The Tribal Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### L.8.3.1.3 Evaluating

The Pauloff Harbor Tribe will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

#### L.8.3.1.4 Updating

The Pauloff Harbor Tribe will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.7. The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Annual reviews should also consider whether new Indigenous Knowledge, local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

Figure L-39 provides a visual of the HMP plan maintenance activities per year.

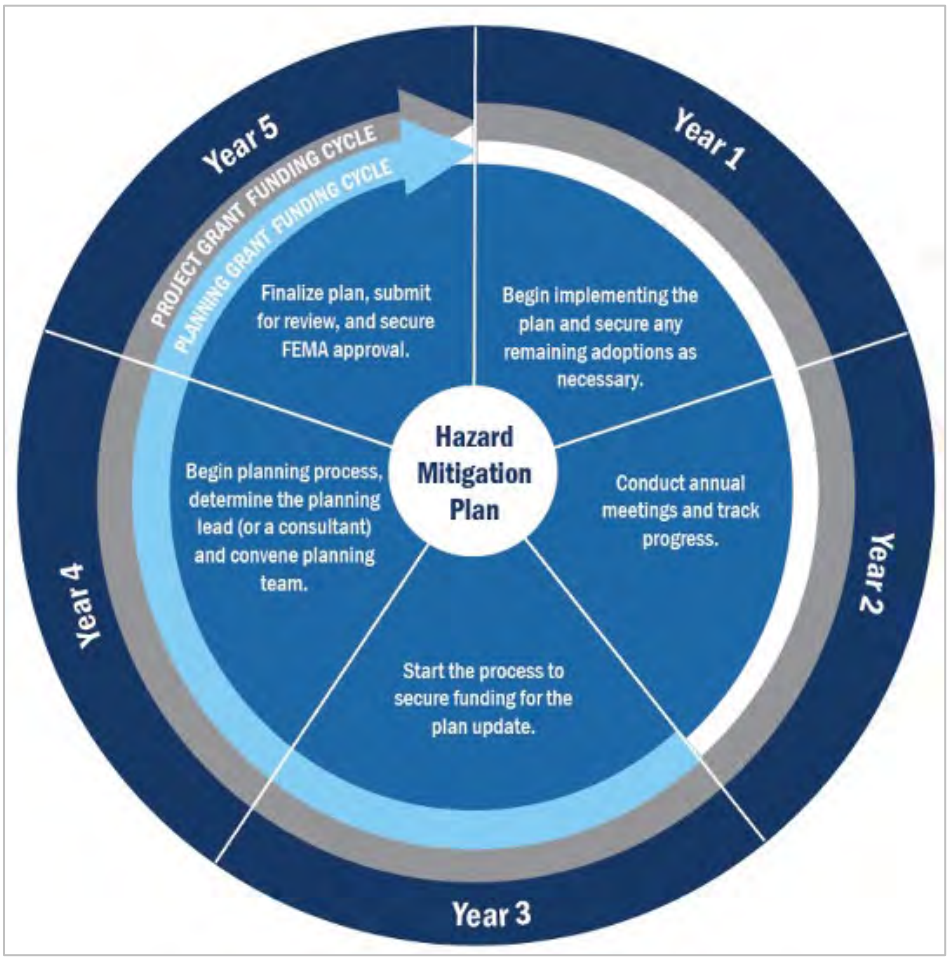



**Figure L-39- HMP Update Schedule**

## L.8.4 Plan Integration

The Pauloff Harbor Tribe will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other planning and implementation processes, when appropriate including other FEMA programs and initiatives.

The Pauloff Harbor Tribe will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include comprehensive and land use planning processes, economic development planning, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects as well as the upcoming APIA Regional Adaptation Plan.

As the plan is implemented, the Pauloff Harbor Tribe will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## L.9 Plan Adoption

The Pauloff Harbor Tribe formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

### L.9.1 Tribal Assurances

The Pauloff Harbor Tribe assures that the Tribal Planning Team and Tribal Council will comply with applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding (including 2 CFR Parts 200 and 3002) and will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes.

[insert signed adoption resolution]

# M. Native Village of Unga

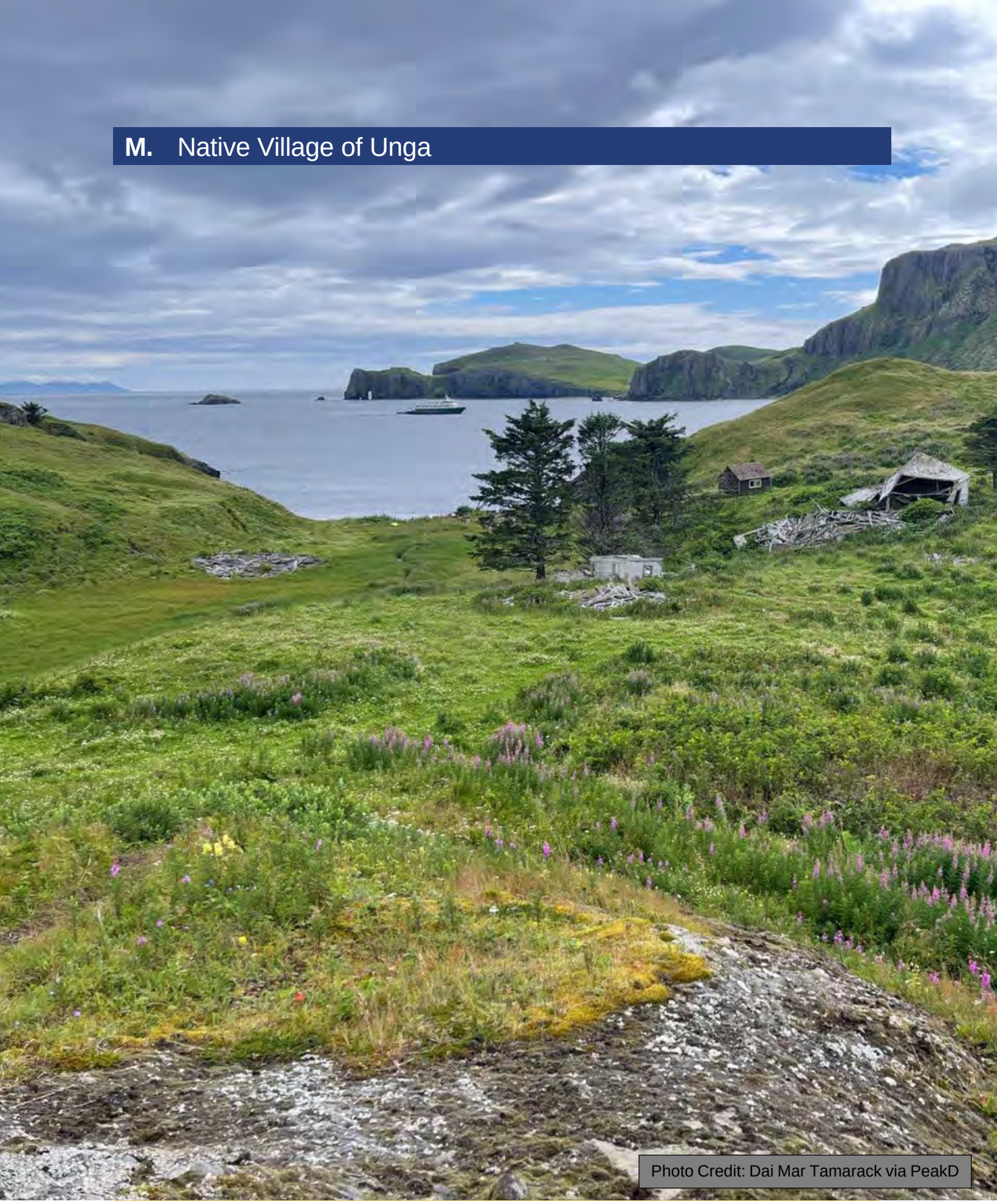


Photo Credit: Dai Mar Tamarack via PeakD

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# M.1 Planning Team and Tribal Definition of Public

## M.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Amy Foster** | Tribal Administrator |
| **Heather Thompson** | Environmental Coordinator |
| **Karis Porcincula** | Environmental Coordinator |
| **John Foster** | Tribal President |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

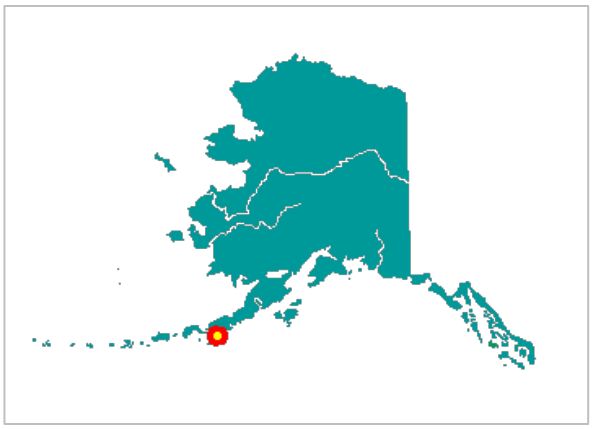
## M.1.2 Tribal Definition of Public

For this planning process, the Native Village of Unga defines the “public” as enrolled Tribal citizens, residents of Sand Point, local businesses and employers, partner governments and organizations, and other individuals with knowledge of or an interest in hazards affecting the community. All community residents may complete surveys and comment on drafts, while the Tribal Council retains authority to adopt the plan for the Tribe.

This definition ensures that anyone who lives or works within the community, as well as enrolled Tribal Members residing outside the community, is eligible to attend and participate in the public involvement portion of the HMP Update planning process.

# M.2 Community Profile

## M.2.1 Location and Geography



The Native Village of Unga is located on the southeastern coast of Unga Island in the Shumagin Islands, part of the Aleutian Island chain, within the Aleutians East Borough. Unga Island is the largest and westernmost island of the Shumagin group, which is situated off the south coast of the Alaska Peninsula.

Unga Island is approximately 24 kilometers (15 miles) **long** and is characterized by predominantly mountainous terrain, with more rolling terrain occurring near the northern portion of the island. The community is situated in a remote coastal environment surrounded by the Pacific Ocean and is subject to a **maritime climate**. Unga receives substantial precipitation and snowfall, and its coastal location exposes the community area to strong winds, heavy precipitation, coastal storms, erosion, and other marine and weather-related hazards.

Unga is no longer occupied year-round and does not have permanent public facilities. The area continues to be used for subsistence activities**,** making the surrounding land and natural resources important to the Native Village and its members. Access is limited to **boats and floatplanes**, with no road connection to other communities. Services associated with the Native Village are provided through Sand Point, approximately 9–10 kilometers (6 miles) to the east across the surrounding waterways.

Land ownership and management in Unga are influenced by the land conveyances established under the Alaska Native Claims Settlement Act (ANCSA)**.** Unga is included in the State of Alaska's Municipal Lands Trustee Program, which identifies Unga among Alaska Native communities with lands conveyed under the ANCSA village land framework. Land ownership and use should be considered when evaluating mitigation projects, infrastructure improvements, and access to areas surrounding the historic village site.

The community's remote location, mountainous terrain, coastal exposure, lack of permanent infrastructure, and dependence on marine and air transportation are important considerations for hazard mitigation planning. These characteristics may complicate emergency access, evacuation, damage assessment, resource delivery, and recovery activities following coastal storms, severe weather, flooding, erosion, landslides, earthquakes, or other hazards.

The Native Village of Unga shareholders predominately live in Sand Point now. Sand Point is a coastal community in southwestern Alaska, in the Aleutian Chain, located on the northwestern portion of Popof Island in the Shumagin Islands group. Sand Point is part of the Aleutians East Borough and serves as the borough seat. The community is located approximately 570 air miles southwest of Anchorage (AEB 2026).

Sand Point is situated on Humboldt Harbor along the northern shore of Popof Island, with Popof Strait separating the island from neighboring Unga Island to the west. The community's island setting places it near the transition between the Alaska Peninsula and the Aleutian Island chain, with the Pacific Ocean surrounding the Shumagin Islands.

The surrounding landscape is characteristic of the maritime environment of the Aleutian region. Popof Island is naturally treeless, with vegetation consisting primarily of alder and willow shrubs, alpine tundra, grasses, sedges, mosses, and wildflowers. The island supports abundant wildlife, including numerous species of seabirds, bald eagles, and marine mammals. The surrounding waters and sheltered harbor also provide important habitat for salmon and other marine species.

## M.2.2 History

The Native Village of Unga has a long history as an Aleut community on Unga Island. The village was first documented by Russian explorers in the early nineteenth century. In 1833, the settlement was recorded as “Delarov” with a population of 116, and it was recorded as “Ougnagok” in 1836. Historical population records show that Unga remained an established community throughout the nineteenth and early twentieth centuries, with its population reaching approximately 313 residents in 1920 (APIA 2026).

During the Russian and early American periods, Unga developed as an important commercial and trading settlement**.** Historical accounts describe a Russian-American Company trading station at the village, where furs were collected and ships used nearby protected waters. By the late nineteenth century, the community was also connected to commercial fishing, mining, and other maritime activities. The Apollo gold mines operated near Unga beginning in the late nineteenth century and provided an additional source of employment and economic activity.

Unga's post office was established in 1888 under the name “Ounga” and was renamed Unga in 1894. The post office remained in operation until 1958, reflecting the community's continuing role as a populated settlement during much of the twentieth century.

The community gradually declined as economic opportunities and essential services became concentrated in other regional communities, particularly Sand Point. The last permanent residents left Unga in 1969, after which the village ceased to be occupied year-round. Many former Unga residents and descendants relocated to Sand Point, while Unga continued to retain cultural and subsistence importance for its former residents and the Native Village (APIA 2026).

Today, Unga is an unoccupied historic village and subsistence-use area rather than a year-round residential community. The Native Village of Unga remains a federally recognized tribal entity, with its headquarters in Sand Point. Tribal members continue to maintain connections to Unga and the surrounding lands and waters through cultural, subsistence, and other activities. The historic community and surrounding area therefore remain important considerations for hazard mitigation planning, particularly because of the area's cultural significance, remote location, and limited transportation and emergency-response infrastructure.

## M.2.3 Population

The Native Village of Unga is a federally recognized Alaska Native tribe associated with the historic village of Unga on Unga Island. The historic village is no longer occupied year-round, and there is no permanent residential population at the village site. The Native Village of Unga, however, maintains its administrative presence in Sand Point, where the tribe's mailing address and tribal administration are located.

The Native Village of Unga has approximately 87 enrolled tribal members based on available Bureau of Indian Affairs enrollment data. The tribe is headquartered in Sand Point, where many Unga tribal members and descendants reside. Because current tribal enrollment information is not publicly available, the 87-member figure should be considered a historical reference rather than a current population estimate (GAO 2005).

The population historically associated with Unga declined substantially during the twentieth century as residents relocated to other communities, particularly Sand Point. Today, Sand Point serves as an important population, service, and administrative center for Unga tribal members and descendants**.** The Unga Tribal Council maintains its office in Sand Point, and Aleutian Pribilof Islands Association (APIA) field personnel in Sand Point include an Unga Tribal Administrator. Unga tribal members also participate in regional health, employment, education, energy assistance, and other services administered through Sand Point and APIA.

Although there is no permanent population at Unga itself, tribal members and descendants continue to maintain connections to the historic village and surrounding lands through subsistence, cultural, recreational, and other traditional activities. Unga is identified by APIA as a subsistence-use site, and access to the area is limited to boats and floatplanes.

For hazard mitigation planning, the population associated with the Native Village of Unga should therefore be considered across both the historic Unga site and the broader population residing in Sand Point and elsewhere who maintain cultural, tribal, or subsistence connections to Unga**.** This distinction is important

for emergency planning because a hazard affecting Unga may primarily threaten people temporarily visiting or using the area, while disruptions affecting Sand Point may directly affect the larger population through which Unga tribal services, administration, and support are currently provided. The remote location of Unga and its lack of permanent public facilities also create challenges for emergency access, evacuation, communications, and delivery of outside assistance.

## M.2.4 Demographics

The Native Village of Unga is an Aleut community with strong cultural and historical ties to Unga Island and the surrounding Shumagin Islands. The community is currently unoccupied on a year-round basis, so demographic characteristics for the historic village site are not directly comparable to those of an active residential community. The Native Village of Unga remains a federally recognized tribe, with its administrative address located in Sand Point.

Many Unga tribal members and descendants are now associated with Sand Point**,** which serves as an important regional population and service center. APIA maintains an Unga Tribal Administrator in Sand Point**,** and Unga tribal members are included among the communities served by regional health, employment, education, and social-service programs.

Demographic considerations for the Native Village of Unga therefore extend beyond the historic village site. Tribal members maintain connections to Unga through subsistence activities, cultural practices, family connections, and use of traditional lands and waters. APIA identifies Unga as a subsistence-use site, with access limited to boats and floatplanes.

For hazard mitigation planning, the geographic separation between the historic village and the current population associated with the tribe is important. Hazards affecting Unga itself may primarily affect seasonal users and tribal members conducting subsistence or cultural activities, while hazards affecting Sand Point may directly affect a larger portion of the Unga tribal community through impacts to housing, transportation, utilities, employment, healthcare, and other essential services. This relationship should be considered when identifying vulnerable populations, critical services, and potential mitigation strategies.

## M.2.5 Economy

The Native Village of Unga no longer has a permanent residential economy at the historic village site. Unga is currently considered a subsistence-use area**,** and there are no public facilities or permanent commercial operations at the village. The tribe's economic activities and administration are now primarily centered in Sand Point, where most Unga tribal members and Unga Corporation shareholders reside.

The economy of Sand Point is dominated by commercial fishing and seafood processing, making the fishing industry an important component of the economic base for Unga tribal members living in the community. Sand Point developed as the regional fishing center after the decline of Unga, and commercial fishing continues to provide employment for vessel owners, crew members, processors, tenders, and businesses supporting the fishing fleet.

Subsistence activities also remain important to the Unga community. Unga's surrounding lands and waters continue to provide opportunities for fishing, hunting, gathering, and other traditional activities. The Unga Tribal Council has identified fisheries as essential to the economic well-being, culture, and way of life of its members and communities in the Eastern Aleutians.

For hazard mitigation planning, the economic relationship between Unga and Sand Point is important. Although the historic Unga village itself has little current economic infrastructure, hazards affecting Unga's surrounding lands and waters could affect subsistence activities and cultural resources. At the same time, hazards affecting Sand Point - particularly its harbor, fishing fleet, seafood-processing facilities, transportation systems, utilities, and other commercial infrastructure - could directly affect Unga tribal members and the economic activities on which they depend. Disruptions to commercial fisheries or transportation could have broader consequences for household income, employment, subsistence access, and tribal economic stability.

## M.2.6 Land Use

Land use associated with the Native Village of Unga is distinct from that of an occupied community. Unga is no longer inhabited year-round and has no public facilities, and the area is primarily used for subsistence, cultural, and traditional activities. Access to the historic village and surrounding lands is limited to boats and floatplanes.

Land ownership and management in Unga are influenced by the Alaska Native Claims Settlement Act (ANCSA) and subsequent land conveyances. Unga is included in Alaska's Municipal Lands Trustee (MLT) Program, which applies to certain lands conveyed under ANCSA to Native village corporations and subsequently held in trust for municipal purposes where applicable. The State identifies Unga as one of the communities included in the MLT program.

The Unga Corporation, the ANCSA village corporation associated with the community, has an important role in land ownership and management. Historical and regional planning information indicates that many Unga Corporation shareholders now reside in Sand Point, while maintaining connections to Unga and its surrounding lands. The corporation has also expressed interest in protecting future economic development and continued generational use of Unga Island.

Current land use is primarily associated with subsistence harvesting, cultural activities, recreation, and seasonal use rather than residential, commercial, or industrial development. The historic village area and surrounding lands and waters remain important to Unga tribal members and shareholders despite the absence of a permanent population.

For hazard mitigation planning, Unga's land-use characteristics are important because limited development does not eliminate hazard exposure. Subsistence users, seasonal visitors, cultural resources, and future development interests may be affected by coastal erosion, flooding, severe weather, landslides, earthquakes, and other hazards. The absence of roads, public facilities, and year-round emergency services also creates significant challenges for emergency access, evacuation, damage assessment, and recovery. Any future development or mitigation project should account for land ownership, ANCSA requirements, cultural resources, site access, and the interests of the Unga Corporation and Native Village of Unga.

## M.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following jurisdictional-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **2006 Unga Tribal Economic Development Plan** | Describes community and economic development goals including preserving history and culture while improving quality of life through increased economic development including fish processing and tourism. | Used relevant information to develop the Community Profile, identify infrastructure and inform risk assessment. |
| **Unga Tribe Long Range Transportation Plan** | Provides details on long-term community access needs and prioritized local road and infrastructure projects. | Reviewed to identify infrastructure and inform risk assessment. |
| **2010, 2021 Aleutians East Borough Hazard Mitigation Plans** | Review past hazard events, mitigation activities, and planning processes. | Compared hazard profiles, history, and impacts of events for risk assessment. |
| **1970 Sand Point Comprehensive Plan** | Provides details on the history, economy, land use, critical facilities, and transportation in Sand Point. | Used relevant information to develop the Community Profile. |
| **1977 City of Sand Point Comprehensive Plan** | | |
| **City of Sand Point Alaska 1981 Comprehensive Plan** | | |
| **2004 City of Sand Point Comprehensive Community Development Plan** | | |
| **2003 Harbor Land Use Plan for Sand Point Alaska** | Lays out a strategy for improving and expanding the city's harbor by organizing land and leases and adding off-loading and storage capacity. | Used to analyze the harbor's vulnerability to natural hazards. |

# M.4 Risk Assessment

## M.4.1 Hazards

This Risk Assessment assesses risk to both the Historical Unga Village geography as well as Sand Point, where the majority of Tribal Members live.

**The Native Village of Unga Planning Team identified the following natural hazards that may impact the Historical Unga Village.**

- ✓ Hazard profiled for this jurisdiction in the MJHMP Update
- X Hazard not profiled for this jurisdiction in the MJHMP Update

- ✓ Changes in the Cryosphere- Sea Ice
- ✓ Changes in the Cryosphere- Snow Avalanche
- ✓ Dam Failure
- ✓ Earthquake
- ✓ Flood
- ✓ Ground Failure/Landslide
- ✓ Invasive Species
- ✓ Sediment Deterioration and Land Destabilization
- ✓ Severe Weather
- ✓ Tsunami
- ✓ Volcano
- ✓ Wildland Fire

| Historic Unga Village/Unga Island | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| Cryosphere- Sea Ice | 2- Possible | 2- Limited | Sea ice can affect transportation, marine access, fisheries, and community operations in Sand Point due to its exposure to the Bering Sea and North Pacific environment.<br>Seasonal sea ice can restrict or complicate vessel travel, delay deliveries, interfere with fishing and marine activities, and create hazardous conditions for small boats and other users of the nearshore environment. Changes in sea-ice extent, timing, and thickness associated with a changing climate may alter traditional travel patterns and increase uncertainty for marine operations. |
| Cryosphere- Snow Avalanche | 2- Possible | 3- Critical | Sand Point, and Unga Island is vulnerable to avalanches due to its steep and rugged mountainous terrain, heavy snowfall, strong winds, and rapidly changing winter weather conditions. Avalanches can occur on steep slopes and may be triggered by heavy snowfall, wind loading, rain, warming temperatures, or seismic activity.<br>Due to a lack of LiDAR data, or other forms of mapping, avalanche hazard areas and risk in Sand Point and Unga Island are not well defined. |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and Sand Point itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and |

| Historic Unga Village/Unga Island | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| | | | tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 2- Possible | 2- Limited | Sediment deterioration and land destabilization can occur throughout Sand Point and Unga Island, with coastal land destabilization being the biggest concern for the community. Since Sand Point is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline. |
| Flood | 3- Likely | 4- Catastrophic | The Planning Team reports that low-lying waterfront areas in Sand Point have experienced coastal flooding, storm surge, and high tides.<br>The Planning Team reports that low-lying waterfront areas are most impacted by storm events. |
| Ground Failure/ Landslide | 2- Possible | 2- Limited | Sand Point and Unga Island are prone to landslides due to steep slopes, heavy precipitation, saturated soil, and thick soil cover over bedrock. Soil creep and flow can be observed throughout the area as topsoil is pulled down slopes by gravity. |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of Sand Point and Unga Island are susceptible to severe weather events and impacts. The Planning Team reports experiencing coastal storms, dense fog, and high winds. |
| Tsunami | 3- Likely | 4- Catastrophic | According to FEMA's National Risk Index, the tsunami risk for Sand Point is Relatively Moderate. According to the State of Alaska DHS&EM, Sand Point has local tsunami potential and a medium risk of distant tsunami potential.<br>There is no formal tsunami inundation mapping for Unga Island. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of Sand Point and Unga Island is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Aleutian volcanos.<br>Volcanic ashfall is the primary volcanic hazard that may impact Sand Point and Unga Island. |
| Wildland Fire | 2- Possible | 2- Limited | The State of Alaska rates Sand Point and Unga Island as having relatively low risk of wildland fires. There is no recorded history of wildland fires in Sand Point or Unga Island. |
| Dam Failure | 2- Possible | 3- Critical | There are two (2) Significant Hazard Potential Dams in Sand Point and one (1) High Hazard dam on Unga Island. Humboldt Creek Reservoir Dam and New England Fish CO Dam, located in Sand Point, have no history of dam failure. |

| Historic Unga Village/Unga Island | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| | | | Squaw Harbor Dam, located on Unga Island, has no history of dam failure.<br>Formal dam failure inundation mapping is not available for any of the three dams. |
| Invasive Species | 3- Likely | 2- Limited | Invasive species pose a potential threat to the ecological, economic, and cultural resources of Sand Point and surrounding Popof Island. The community's reliance on marine transportation, air travel, fishing, and freight creates pathways for invasive plants, insects, wildlife, and marine organisms to be introduced through contaminated cargo, equipment, vessels, and fishing gear. Once established, invasive species could displace native species, alter wildlife and marine habitats, affect subsistence and commercial fisheries, and increase costs associated with monitoring and control. |

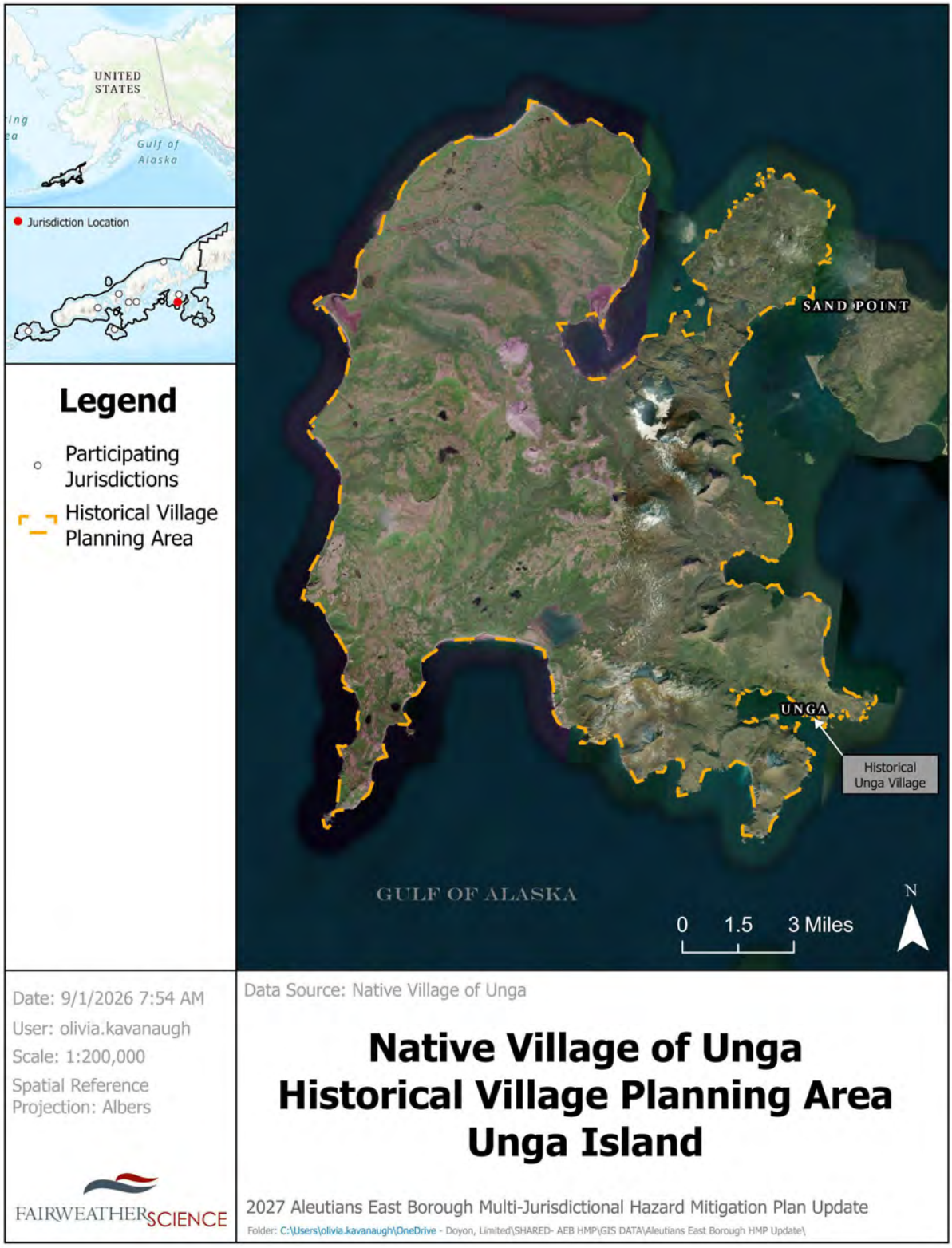



**Figure M-1- Native Village of Unga Planning Area- Unga Village**

**The Native Village of Unga Planning Team identified the following natural hazards that may impact their assets and Tribal members in Sand Point.**

✓ Hazard profiled for this jurisdiction in the MJHMP Update
X Hazard not profiled for this jurisdiction in the MJHMP Update

- ✓ Changes in the Cryosphere- Sea Ice
- ✓ Changes in the Cryosphere- Snow Avalanche
- ✓ Dam Failure
- ✓ Earthquake
- ✓ Flood
- X Ground Failure/Landslide
- ✓ Invasive Species
- ✓ Sediment Deterioration and Land Destabilization
- ✓ Severe Weather
- ✓ Tsunami
- ✓ Volcano
- ✓ Wildland Fire

| Sand Point Geography | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| Cryosphere- Sea Ice | 2- Possible | 2- Limited | Sand Point is occasionally impacted by sea ice, mainly due to the presence of sea ice in the Bay impacting vessel transportation. |
| Cryosphere- Snow Avalanche | 2- Possible | 2- Limited | Sand Point is vulnerable to avalanches due to its steep and rugged mountainous terrain, heavy snowfall, strong winds, and rapidly changing winter weather conditions. Avalanches can occur on steep slopes and may be triggered by heavy snowfall, wind loading, rain, warming temperatures, or seismic activity. |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The Aleutians East Borough spans 118 miles along the 2,485-mile Alaska-Aleutian Megathrust. Smaller faults that could impact the Aleutians East Borough Planning Area include the Shumagin Gap.<br>The Aleutians East Borough frequently experiences earthquakes with a magnitude of 6.0 and greater, and Sand Point itself has experienced strong shaking from this regional hazard. Secondary impacts such as landslides and tsunamis are common and cause secondary hazard potential/impacts. |
| Sediment Deterioration and Land Destabilization | 2- Possible | 2- Limited | Sediment deterioration and land destabilization can occur throughout Sand Point, with coastal land destabilization being the biggest concern for the community. Since Sand Point is classified as a coastal community, it is susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surge, high winds, and severe storms that contribute to destabilization along the community's extensive coastline. |
| Flood | 3- Likely | 4- Catastrophic | The Planning Team reports that low-lying waterfront areas in Sand Point have experienced coastal flooding, storm surge, and high tides.<br>The Planning Team reports that low-lying waterfront areas are most impacted by storm events. |

| Sand Point Geography | | | |
|---|---|---|---|
| **Hazard** | **Probability** | **Magnitude/ Severity** | **Hazard Narrative** |
| Ground Failure/ Landslide | Did not profile this hazard. | | |
| Severe Weather | 4- Highly Likely | 3- Critical | The entire geography of Sand Point is susceptible to severe weather events and impacts. The Planning Team reports experiencing coastal storms, dense fog, and high winds. |
| Tsunami | 3- Likely | 3- Critical | According to FEMA's National Risk Index, the tsunami risk for Sand Point is Relatively Moderate. According to the State of Alaska DHS&EM, Sand Point has local tsunami potential and a medium risk of distant tsunami potential. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of Sand Point is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Aleutian volcanos.<br>Volcanic ashfall is the primary volcanic hazard that may impact Sand Point |
| Wildland Fire | 2- Possible | 2- Limited | The State of Alaska rates Sand Point as having relatively low risk of wildland fires. There is no recorded history of wildland fires in Sand Point. |
| Dam Failure | 2- Possible | 3- Critical | There are two (2) Significant Hazard Potential Dams in Sand Point.<br>Humboldt Creek Reservoir Dam and New England Fish CO Dam, located in Sand Point, have no history of dam failure.<br>Formal dam failure inundation mapping is not available for either dam. |
| Invasive Species | 3- Likely | 2- Limited | Invasive species pose a potential threat to the ecological, economic, and cultural resources of Sand Point and surrounding Popof Island. The community's reliance on marine transportation, air travel, fishing, and freight creates pathways for invasive plants, insects, wildlife, and marine organisms to be introduced through contaminated cargo, equipment, vessels, and fishing gear. Once established, invasive species could displace native species, alter wildlife and marine habitats, affect subsistence and commercial fisheries, and increase costs associated with monitoring and control. |

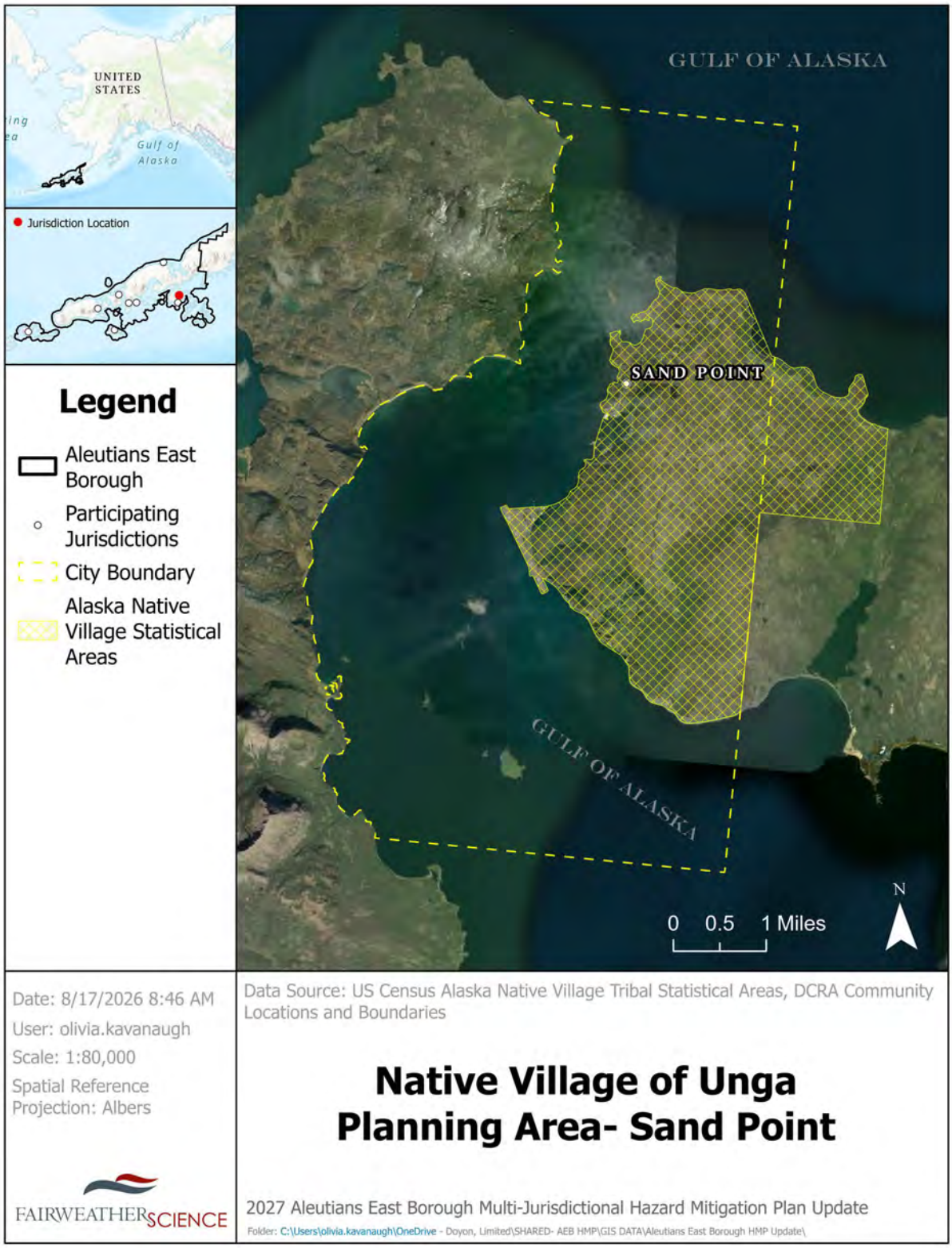



**Figure M-2- Native Village of Unga Planning Area- Sand Point**

### M.4.1.1 Changes in the Cryosphere- Sea Ice

#### M.4.1.1.1 Location

Unga lies on the southeast coast of Unga Island, in the Shumagin Islands of the Aleutian Chain (APIA 2026). First an Aleut village, Unga is no longer occupied year-round and is visited as a subsistence-use site.

Within the City of Sand Point's geography, Mud Bay freezes over. Mud Bay is located on the northwest coast of Popof Island.

The Planning Team reports that during extremely cold winters Delarof Bay freezes over. Delarof Bay, also known as Delarof Harbor, is located on the southeast coast of Unga Island. The old village site is toward the northeast entrance of the Bay.

Given its location on the southeast coast of Unga Island, the presence of sea ice is relatively rare.

#### M.4.1.1.2 History

Sea ice extending as far south as Unga Island is rare. The Native Village of Unga Planning Team reports that during extreme cold winters Delarof Bay freezes over. Outside of this report, specific historical events relating to sea ice are not available.

#### M.4.1.1.3 Extent (Magnitude and Severity)

Based on the extent of past sea ice events and the criteria identified in Table 5 in the Base Plan, the extent of Changes in Cryosphere – Sea Ice in the Unga Village is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past sea ice events and the criteria identified in Table 5 in the Base Plan, the extent of Changes in Cryosphere – Sea Ice in Sand Point is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### M.4.1.1.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The Native Village of Unga Planning Team reports that during extreme cold winters Delarof Bay freezes over. No other specific previous impacts due to changes in sea ice were reported in Unga Village or Sand Point. |
| Infrastructure | The Planning Team did not report specific previous impacts to infrastructure due to changes in sea ice in Unga Village or Sand Point. |
| People | The Planning Team did not report specific previous impacts to people due to changes in sea ice in Unga Village or Sand Point. |
| Utilities | The Planning Team did not report specific previous impacts to utilities due to changes in sea ice in Unga Village or Sand Point. |
| Transportation | The Planning Team did not report specific previous impacts to transportation due to changes in sea ice in Unga Village or Sand Point. |
| Economy | The Planning Team did not report specific previous economic impacts due to changes in sea ice in Unga Village or Sand Point. |
| Subsistence Resources | The Planning Team did not report specific previous impacts to subsistence resources due to changes in sea ice in Unga Village or Sand Point. |

#### M.4.1.1.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that the Unga Village will experience a sea ice event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Sand Point will experience a sea ice event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### M.4.1.1.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of sea ice hazards in Alaska. |
| Location | Future climate conditions are likely to influence the location of sea ice changes and associated hazards in Alaska by shifting the typical location of sea-ice loss northward and earlier in the season, resulting in longer periods of open water across the Bering Sea and reducing the likelihood that protective ice will form or persist near the Aleutians East Borough Planning Area. |
| Extent | Future climate conditions are likely to influence the extent of sea ice. The winter Bering Sea Ice cover continues to retreat as a long-term trend with year-to-year variability (State of Alaska DHS&EM 2023). |
| Impact | During the last several decades, Alaska has warmed twice as fast as the rest of the U.S. Sea ice and climate are intimately linked. An ice bench reduces wave development in the open ocean during winter months. Without an ice bench, waves can mechanically erode coastal beaches. Many villages are located along Alaska's coastline and are threatened by eroding shores.<br><br>Retreat of sea ice is anticipated to disrupt marine ecosystem; impact local communities where sea ice is important for subsistence or tourism, and contribute to increased storm surge, coastal flooding, and sediment deterioration and land destabilization (2022 Cold Bay HMP). The presence of sea ice, which may continue to be highly variable from year to year despite a long-term downward trend, may cause delays to freight and damage to marine and coastal infrastructure. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of sea ice cover-related events, especially severe storms, in the Unga Village and Sand Point Planning Area. Due to the loss of winter sea ice and other factors including increased temperatures and precipitation, Alaska is projected to see a threefold increase in severe storms (State of Alaska DHS&EM, 2023). |
| Population Patterns | Future climate conditions may influence population patterns as they relate to sea ice hazards, as increased frequency and adverse impacts from severe storms could lead people to relocate from vulnerable coastal areas, or from the community entirely. |
| Land Use Development | Future climate conditions may influence land use development as it relates to sea ice hazards, as an increase in severe storms without sea ice protection could lead to changes in the location of certain land use development activities - such as areas slated for marine infrastructure, residential construction or waste management - that are vulnerable to these severe storms. |

| Description of Future Conditions | |
|---|---|
| Subsistence Resources | Future climate conditions are expected to influence subsistence resources as they relate to sea ice hazards. Low winter sea ice extents, which have been seen in the Bering Sea in the last decade, affect the marine ecosystem that supports subsistence resources that are critical to AEB communities' ways of life. Some species are expected to shift northward, such as Pacific Cod. Migration patterns and timing for species including salmon, marine mammals, and subsistence waterfowl are also observed and expected in the future. |

### M.4.1.2 Changes in the Cryosphere- Snow Avalanche

#### M.4.1.2.1 Location

Unga lies in the maritime climate zone, with temperatures ranging from -9 to 76 degrees F. Snowfall averages 52 inches (APIA 2026).

Unga Island consists primarily of low rolling hills and grasslands. The eastern side of Unga Island is mountainous, rising to a highest peak of 2030 feet. The coastline along the southeastern side of the island is steep and rugged, with wave action creating cliffs along the coast in many places (Eakins, G. R. 1970).

Figure M-3 estimates avalanche hazard areas in Unga Village and Figure M-4 estimates avalanche hazard areas in Sand Point.

As avalanche hazard areas are not well defined in the community and detailed terrain data, such as LiDAR, were not available, ArcGIS Pro basemaps, including satellite imagery, topographic maps, and terrain data, were used to identify mountainous areas, elevation, and observable slope characteristics.

Potential avalanche hazard areas were manually delineated based on these features. Where available, photographs of the surrounding geography were also reviewed to confirm the presence of steep slopes and other terrain characteristics indicative of potential avalanche hazard.

***This assessment is intended to identify potential areas of avalanche hazard at a planning level. It is not a substitute for site-specific avalanche hazard mapping, geotechnical investigations, or detailed evaluation of local topography, snow conditions, and site-specific conditions. Areas identified through this assessment should be considered preliminary and should be subject to further investigation where development or other activities may be exposed to avalanche hazards.***

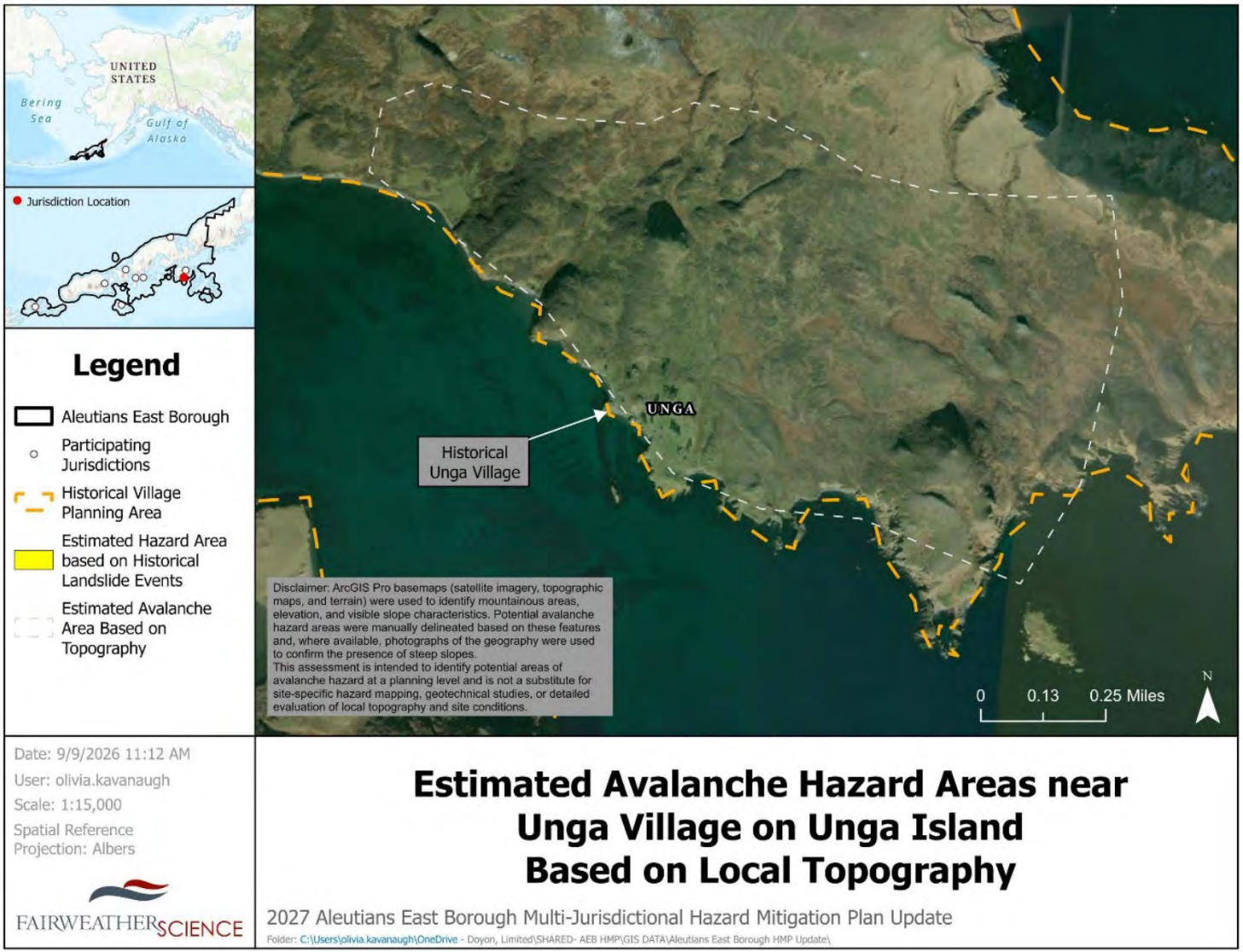



**Figure M-3- Estimated Avalanche Hazard Areas near Unga Village**

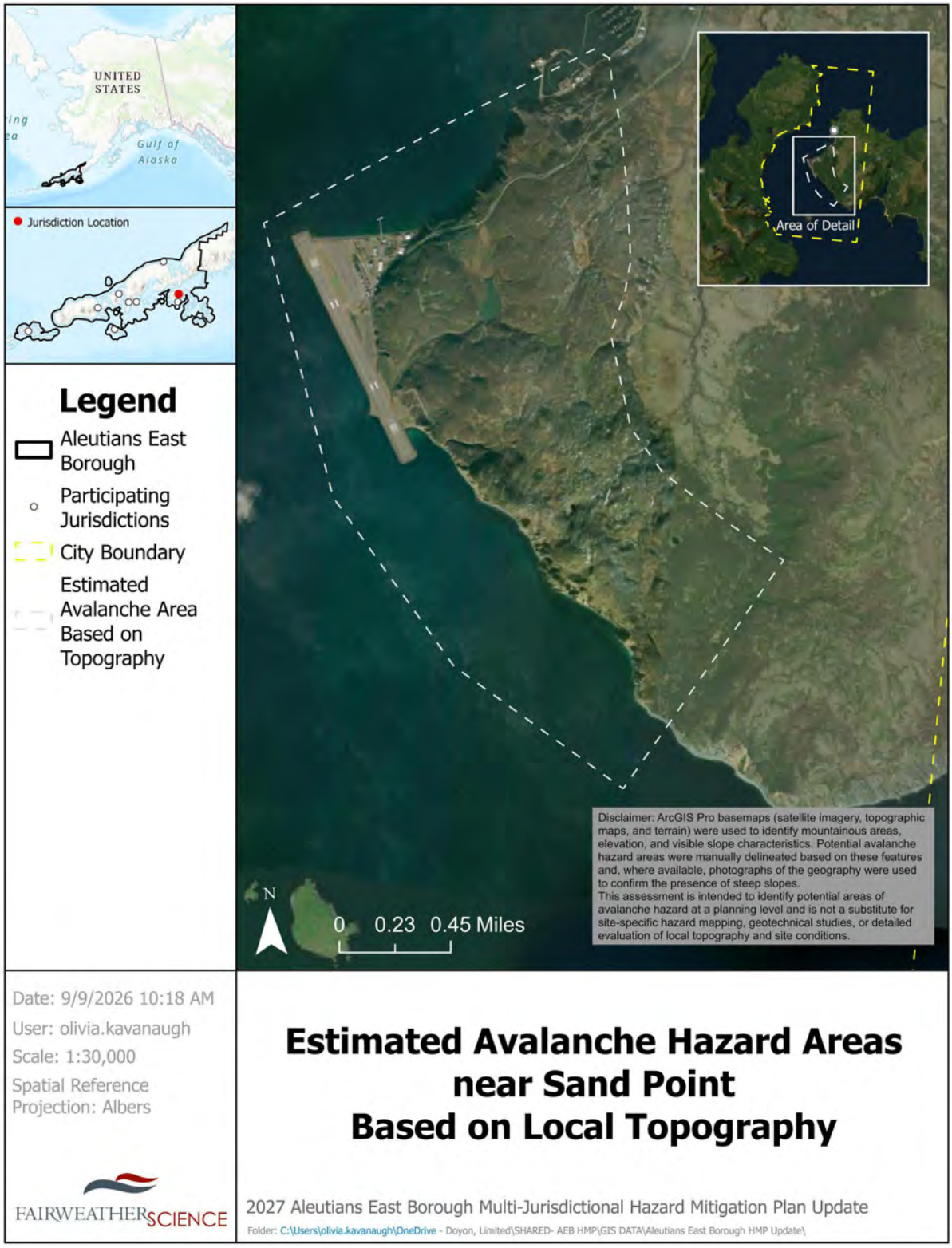



**Figure M-4- Estimated Avalanche Hazard Areas in Sand Point**

#### M.4.1.2.2 History

The Planning Team reports that avalanches have occurred from heavy rains and earthquakes along cliffs and mountainsides. This is reported for both the City of Sand Point geography and the Unga Village geography on Unga Island.

There is very little documented information about snow avalanches and their impacts for the Aleutians East Borough and its communities.

#### M.4.1.2.3 Extent (Magnitude and Severity)

Based on the extent of past snow avalanche events and the criteria identified in Table 5 in the Base Plan, the extent of snow avalanche in Unga Village is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past snow avalanche events and the criteria identified in Table 5 in the Base Plan, the extent of snow avalanche in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### M.4.1.2.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The Planning Team did not report specific previous impacts from snow avalanches to geography/land in Unga Village or Sand Point. |
| Infrastructure | The Planning Team did not report specific previous impacts from snow avalanches to infrastructure in Unga Village or Sand Point. |
| People | The Planning Team did not report specific previous impacts from snow avalanches to people in Unga Village or Sand Point. |
| Utilities | The Planning Team did not report specific previous impacts from snow avalanches to utilities in Unga Village or Sand Point. |
| Transportation | The Planning Team did not report specific previous impacts from snow avalanches to transportation systems in Unga Village or Sand Point. |
| Economy | The Planning Team did not report specific previous economic impacts from snow avalanches in Unga Village or Sand Point. |
| Subsistence Resources | The Planning Team did not report specific previous impacts from snow avalanches to subsistence resources in Unga Village or Sand Point. |

#### M.4.1.2.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Unga Village will experience a snow avalanche event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Sand Point will experience a snow avalanche event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### M.4.1.2.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of snow avalanche hazards in Alaska. |
| Location | Future climate conditions may influence the location of future snow avalanche events, as winter precipitation in Unga is likely to increase by approximately 24% (UAF/SNAP 2026). This could increase the areas that may have enough snow load to slide. |
| Extent | Future climate conditions are likely to influence the extent of snow avalanche. While uncertain, winter is likely to have more precipitation, possibly leading to deeper avalanches with longer runout zones (UAF/SNAP 2026). |
| Impact | Snow avalanches can be very destructive to people and infrastructure caught in the slide zone. The possibility of more winter precipitation could lead to more frequent avalanche hazard conditions, threatening people and infrastructure in areas with avalanche risk. Large avalanches can disrupt transportation and utility systems. |
| Probability of Future Events | Future climate conditions may influence the probability of snow avalanches, as Unga is projected to have more winter precipitation. However, average annual temperatures are also projected to increase by 9 °F by the end of the century, possibly decreasing the amount of precipitation falling as snow (UAF/SNAP 2026). |
| Population Patterns | Future climate conditions are unlikely to influence population patterns as they relate to snow avalanche hazards in Unga Village or Sand Point. |
| Land Use Development | Future climate conditions may influence land use development as it relates to snow avalanche hazards, as an increase in snow avalanches could lead to changes in the location of certain land use development activities - such as areas slated for marine infrastructure, residential construction or waste management - that are in avalanche runout areas. |
| Subsistence Resources | Future climate conditions are expected to influence subsistence resources as they relate to sea ice hazards. Low winter sea ice extents, which have been seen in the Bering Sea in the last decade, affect the marine ecosystem that supports subsistence resources that are critical to AEB communities' ways of life. Some species are expected to shift northward, such as Pacific Cod. Migration patterns and timing for species including salmon, marine mammals, and subsistence waterfowl are also observed and expected in the future. |

### M.4.1.3 Dam Failure

There is one dam on Unga Island (outside of the historical Unga Village) and two dams in Sand Point.

#### M.4.1.3.1 Location

| NID ID #AK00105 Squaw Harbor Dam | |
|---|---|
| Hazard Classification | High (Proposed by Alaska State Dam Engineer) |
| Owner | Unknown |
| Year Built | Unknown |
| Dam Type | Unknown |
| Dam Purpose | Unknown |
| Length x Height | Unknown |
| Drainage Area | Unknown |
| Inspection Frequency | There is no available information about the inspection frequency or the last inspection date for Squaw Harbor Dam. |
| Downstream Description | There is one outflow creek below the dam embankment. The dam is approximately 800 feet from Squaw Harbor, which is in Baralof Bay on Unga Island. |
| Downstream Area | The Squaw Harbor Dam structure discharges into a creek which flows into Squaw Harbor. The area downstream of the dam consists of dense vegetated riparian corridors until the creek reaches the cannery infrastructure and the surrounding rocky coastline. |
| Downstream Dams | There are no dams immediately downstream of the Squaw Harbor Dam. |
| Downstream Bridges | There are no bridges downstream of Squaw Harbor Dam. |
| Reservoir Area | Squaw Harbor Dam reservoir is rectangular shaped (roughly), with a length of 630 feet at its longest and a width of 300 feet at its widest. |
| Downstream Development | Approximately 0.5 miles downstream of Squaw Harbor dam is an abandoned cannery/fish processing facility, four (4) small buildings, and one gravel road. There is also caretaker dwelling that is downstream of the dam. |
| General findings of the last inspection | No information has been made available about the dam's most recent inspection, or what condition it was rated. Based on observations from the State of Alaska's dam coordinator, a preliminary rating of **Poor** was given due to seepage issues identified with the dam. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could also bring debris downstream. Potential inundation of the gravel road, caretaker facility, and cannery infrastructure are possible. Further, the reservoir would be drained to the level allowed by the dam break. |
| Recommended Hazard Potential Classification | The State of Alaska Dam Safety Engineer has preliminarily classified this dam as High Hazard Potential. Due to the downstream development and potential loss of life, this recommendation is accurate and justified based on current classification guidelines. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026

| NID ID #AK00268 Humbolt Creek Reservoir Dam | |
|---|---|
| Hazard Classification | Significant |
| Owner | City of Sand Point |
| Year Built | Unknown |
| Dam Type | Earth |
| Dam Purpose | Water Supply |
| Length x Height | 395 ft x 19 ft |
| Drainage Area | 4.7 square miles |
| Inspection Frequency | The most recent inspection date is January 21, 2022. The dam is inspected every three years. |
| Downstream Description | There are four culverts in the dam embankment that drain water from the dam, creating a stream that flows into the ocean. Approximately 800 feet downstream of the dam outflow, Humboldt Creek widens to almost 300 feet when reaching the tidal zone. The downstream area is treeless and compromised of tundra plants and low-lying brush. |
| Downstream Area | The Humboldt Creek Reservoir Dam downstream area contains industrial/commercial property, both primary and secondary roads, utilities, and a small boat harbor. |
| Downstream Dams | There are no dams immediately downstream of the Humboldt Creek Reservoir Dam. |
| Downstream Bridges | There are two bridges downstream of the Humboldt Creek Reservoir Dam. One is a pedestrian bridge and a vehicle bridge. The vehicle bridge is on Sand Point Rd, and the pedestrian bridge connects the small boat harbor to the northern peninsula across from the small boat harbor. Airport Road also crosses over the top of the dam. |
| Reservoir Area | The maximum impoundment volume is 55-acre feet, with a reservoir maximum storage surface area of 11 acres. The reservoir is approximately 800 feet long and 360 feet wide. |
| Downstream Development | Sand Point lies approximately 0.4 miles to the west of the dam. In the tidal zone, which is approximately 250 yards beyond the dam outflow, is a large amount of development. There is Sand Point Rd and bridge, the Robert E. Galovin Small Boat Harbor and its pedestrian bridge. There is also the Trident Seafoods Processing plant. |
| Overall assessment of the 2022 inspection | At the time of the most recent inspection, the condition assessment of the dam was rated as Poor**.** The primary reason for the designation was due to a crack in the earthen embankment and buckling of culverts that run through the dam embankment. These are likely due to recent earthquakes occurring in the vicinity of Sand Point. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026, Terra Firma Testing 2022

| NID ID #AK00122 New England Fish CO Dam | |
|---|---|
| Hazard Classification | Significant |
| Owner | Shumagin Corporation |
| Year Built | 1940 |
| Dam Type | Earth |
| Dam Purpose | Water Supply |
| Length x Height | 283 ft x 10 ft |
| Drainage Area | Unknown |
| Inspection Frequency | The most recent inspection is unknown. Inspection frequency is every 5 years. |
| Downstream Description | New England Fish CO Dam is located approximately 0.6 miles from Popof Straight, where the outflow creek terminates after crossing underneath the Sand Point Airport. |
| Downstream Area | The New England Fish CO Dam structure discharges into its outflow creek. The creek flows through a narrow, deep canyon before up against the Sand Point Airport and discharging in Popof Straight. The drainage canyon is heavily brushed with no infrastructure. There is the Old Reservoir to Red Cove Trail to the south of the outflow creek and several unnamed access trails to the north of the access creek. They meet at the top of the dam. |
| Downstream Dams | There are no dams immediately downstream of New England Fish CO Dam. |
| Downstream Bridges | There is one (1) bridge downstream of New England Fish CO Dam. The outflow creek flows up against the east side of the Sand Point Airport runway and then turns south and crosses under a trail bridge. Additionally, there is a motorized trail that runs across the top of the dam. |
| Reservoir Area | New England Fish CO dam has a maximum capacity of 105-acre feet and a surface area of 8.5 acres. The reservoir is approximately 1000 feet long and 580 feet wide. |
| Downstream Development | The major downstream development of New England Fish CO Dam is the Sand Point Airport. The runway butts against the outflow creek, where it then turns sharply parallel to the runway. The airport terminal and support structures are located on the northeast side of the runway, and these structures are protected from potential inundation due to Arch Rock and the surrounding hill between the infrastructure and the outflow creek. |
| General findings of the most recent inspection | A preliminary inspection by the State of Alaska Dam Safety Engineer, based on observations, rated the dam in **Unsatisfactory** Condition. |
| Potential Effects of a Dam Break | Potential effects include flooding and land destabilization of the outflow creek which could bring debris downstream. Potential inundation of Sand Point Airport runway and Old Reservoir to Red Cove Road could delay or prohibit air transportation to and from Sand Point. |
| Recommended Hazard Potential Classification | The State of Alaska Dam Safety Engineer has recommended classifying this dam as having Significant Hazard Potential. Due to the proximity to the airport, other downstream development and potential loss of life, this recommendation is accurate and justified based on current classification guidelines. |

Source: NID 2026, State of Alaska Dam Safety Engineer 2026

#### M.4.1.3.2 History

Squaw Harbor Dam has no recorded history of dam failure.

The two dams in Sand Point, Humboldt Creek Reservoir Dam and New England Fish CO Dam, have no recorded history of dam failure.

#### M.4.1.3.3 Extent (Magnitude and Severity)

Squaw Harbor Dam

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

Humboldt Creek Reservoir Dam

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

New England Fish CO Dam

As formal dam failure inundation mapping was not available for analysis, the methodology for estimating possible dam inundation was to extend 1 mile downstream from the dam outflow, and buffer 0.1 miles from the downstream area.

Based on the extent of past dam failure events and the criteria identified in Table 5 in the Base Plan, the extent of dam failure at Unga Island is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

Based on the extent of past dam failure events and the criteria identified in Table 5 in the Base Plan, the extent of dam failure in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

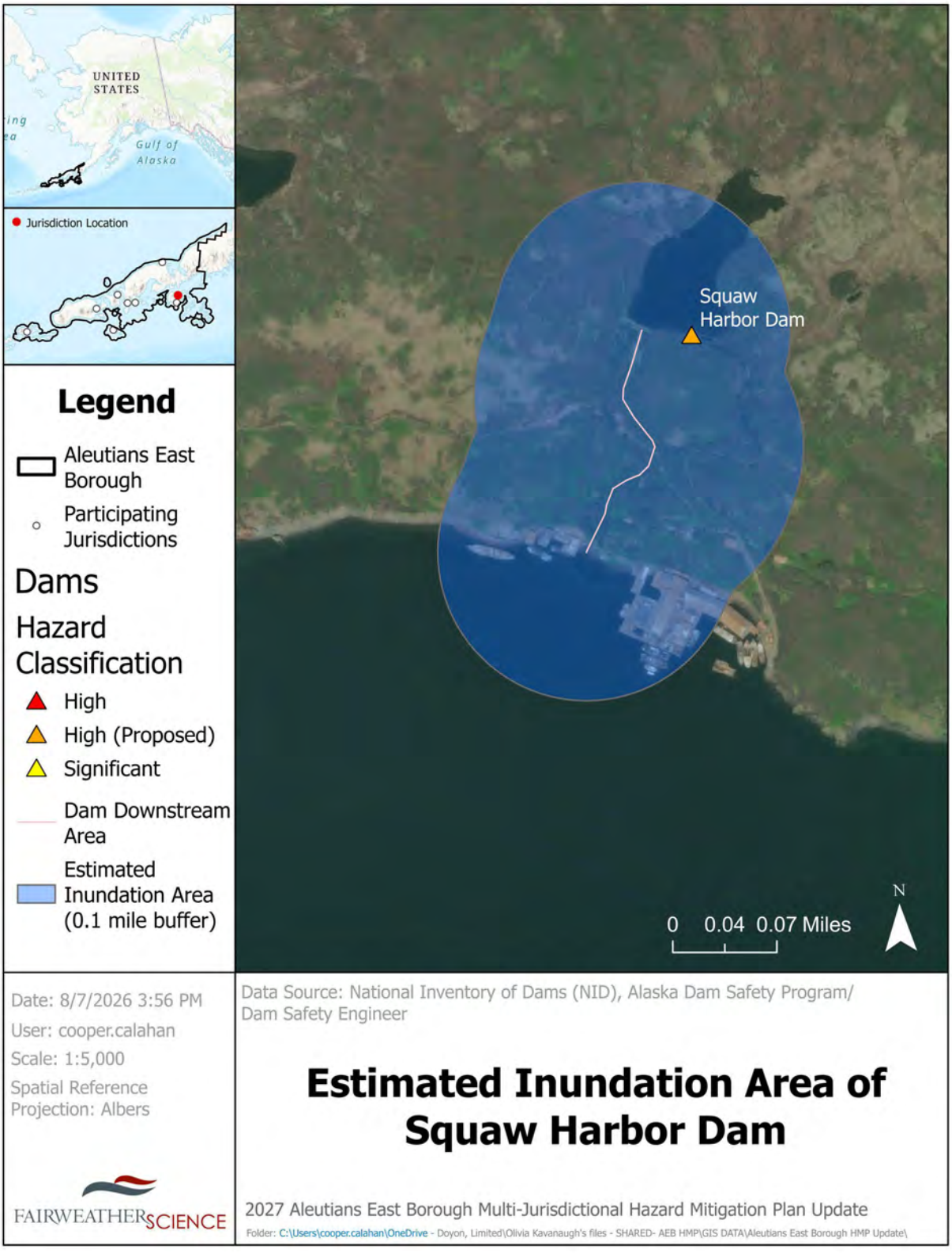



**Figure M-5 - Estimated Inundation Area of Squaw Harbor Dam (outside of Unga Village limits)**

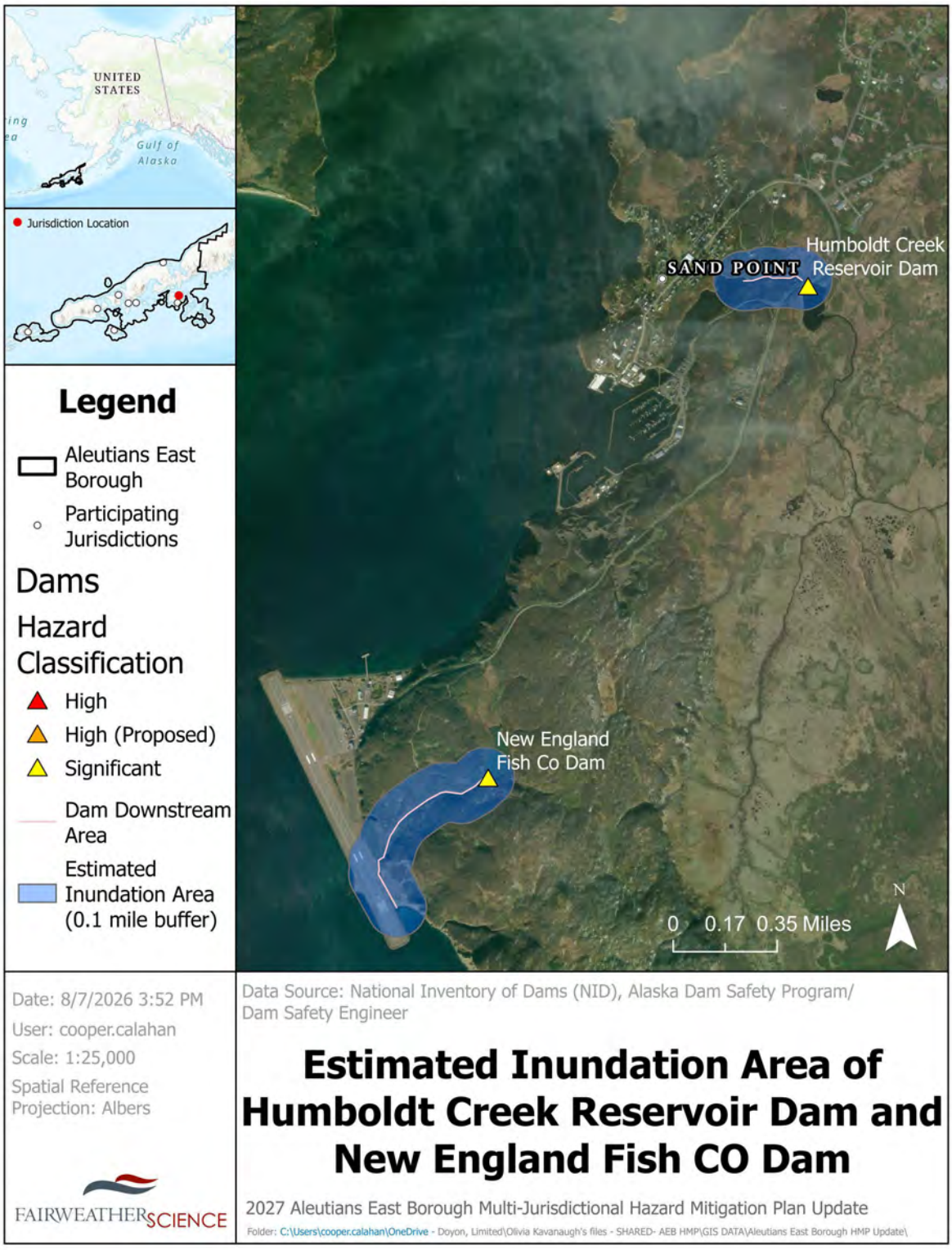



**Figure M-6 - Estimated Maximum Inundation Area of Humboldt Creek Reservoir Dam and New England Fish Co Dam in Sand Point**

#### M.4.1.3.4 Impact

| Description of Impact | |
|---|---|
| Geography/Land | There have been no recorded impacts on land or geography from dam failures on Unga Island or in Sand Point. |
| Infrastructure | There have been no recorded dam failure impacts on infrastructure on Unga Island. There are no critical facilities that are at risk from dam failure inundation from Squaw Harbor Dam. However, the two dams in Sand Point pose a risk to critical facilities. These facilities include the Salmon Hatchery, Aquaculture Building, Volunteer Fire Department Building, City Pump House, two Water Tanks, Humboldt Creek Reservoir Dam, and New England Fish CO Dam. |
| People | There are no recorded injuries or fatalities due to dam failure impacts in Sand Point or Unga Island. |
| Utilities | There are no recorded dam failure impacts on utility systems in Sand Point or Unga Island. |
| Transportation | There is no recorded dam failure impacts on transportation systems in Sand Point or Unga Island. |
| Economy | There are no recorded economic impacts due to dam failure in Sand Point or Unga Island. |
| Subsistence Resources | There are no recorded impacts on subsistence resources due to dam failure. |

#### M.4.1.3.5 Probability of Future Events

Squaw Harbor Dam is proposed to be in Poor condition by the State of Alaska Dam Safety Engineer, based on preliminary observations.

However, the State of Alaska Dam Safety Engineer warned of “condition creep”, where observational assessments have rated dams more poorly than their most recent available condition rating.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Squaw Harbor Dam on Unga Island will experience a dam failure event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Sand Point will experience a dam failure event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### M.4.1.3.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are unlikely to influence the nature of future dam failures in Sand Point or on Unga Island. |
| Location | Future climate conditions are unlikely to influence the location of future dam failures in Sand Point or on Unga Island. However, changing factors that influence the |

| Description of Future Conditions | |
|---|---|
| | potential of a dam failure (heavy rains, flooding) may result in failure of a dam that has not previously failed. |
| Extent | It is possible that future climate conditions will influence the magnitude and severity of dam failure in Sand Point or on Unga Island. A potential outcome of changing climate in Alaska is an increase in extreme precipitation events which are likely to lead to more severe floods and a greater risk of dam failure. |
| Impact | It is possible that future climate conditions will influence the impact of dam failure in Sand Point or on Unga Island. Increased precipitation is likely to lead to more frequent dam failures of dams with conditions of Poor or Fair, unless dam deficiencies are addressed. The impact of these dam failures may include damage to homes and critical facilities in the inundation area, potential loss of life, overtopping of roads which may lead to land destabilization and traffic disruptions, and funding required to rehabilitate failed dams. |
| Probability of Future Events | It is possible that future climate conditions will influence the probability of future dam failure events in Sand Point or on Unga Island. Increased precipitation and frequency of severe weather events could contribute to more stress on dams in the Planning Area. At present, there is no comprehensive assessment of climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the design and construction of new dams operated in the face of changing climate risk. Engineers use the best data available during dam inspections, which could lead to safety modifications in the future as future climate conditions change the loading conditions of a dam. |
| Changes in Population Patterns | It is possible that future dam failures will cause changes in population patterns in Sand Point or Unga Island, as residents may relocate in and out of potential future inundation areas. Residents of Sand Point may also relocate out of the area if impacted severely enough by a dam failure. |
| Changes in Land Use Development | It is possible that future climate conditions will influence changes in land use development in Sand Point or on Unga Island. Dam failure inundation areas may become unsuitable for future development to reduce future losses, or development will be restricted in inundated areas. Alternatively, if population migration occurs into an inundation area, a dam may be reclassified from Significant to High hazard. |
| Subsistence Resources | It is possible that future climate condition will lead to a dam failure that could impact subsistence resources. A dam failure could cause downstream flooding, which could impact downstream subsistence resources such as berry patches, freshwater fishing locations, subsistence infrastructure (fish racks or houses, hunting cabins, etc.) and could prohibit or delay access to subsistence grounds. |

The information below summarizes the influence of future climate conditions on the hazards that may impact the potential for a dam failure in Unga Island and Sand Point.

| Hazard | Future Conditions | | Influence on Dam Failure Probability | |
|---|---|---|---|---|
| | Extent | Probability of Future Events | Extent | Probability of Future Events |
| **Flood** | Increase | Increase | Increase | Increase |
| **Landslide** | Unknown | Unknown | Unknown | Unknown |
| **Heavy Snow** | Increase | Decrease | Increase | Increase |
| **Heavy Rain** | Increase | Increase | Increase | Increase |
| **Earthquake** | No change | No change | No change | No change |

As future climate conditions are influencing the extent and recurrence probability of several hazards that influence the potential of a dam failure, the likelihood of cascading impacts of upstream and downstream flooding potential increases. USGS recently updated their seismic hazard map and climate change/future conditions are not expected to change the extent or probability of earthquakes.

### M.4.1.4 Earthquake

#### M.4.1.4.1 Location

The entire geography of Unga Island and Sand Point is vulnerable to earthquakes, due to its location on the Alaska-Aleutian subduction zone.

According to the 2023 State of Alaska HMP, Unga Island is located in an area with the potential of severe perceived shaking from earthquakes (PGA 34 – 65). Perceived shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. These maps focus on the actual variations in shaking intensity across a region as felt by people and structures.

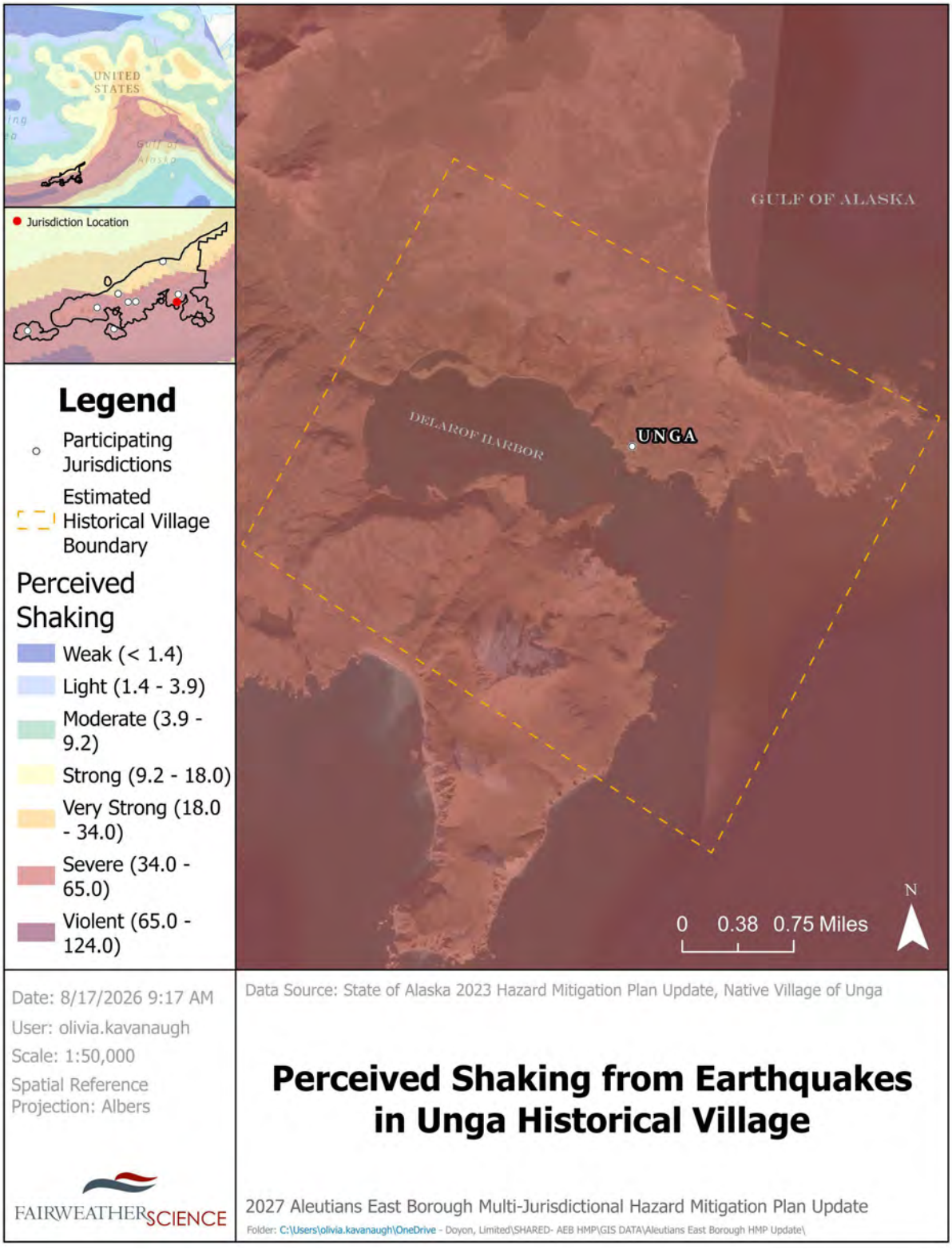



**Figure M-7 - Perceived Shaking from Earthquakes, Unga Historical Village**

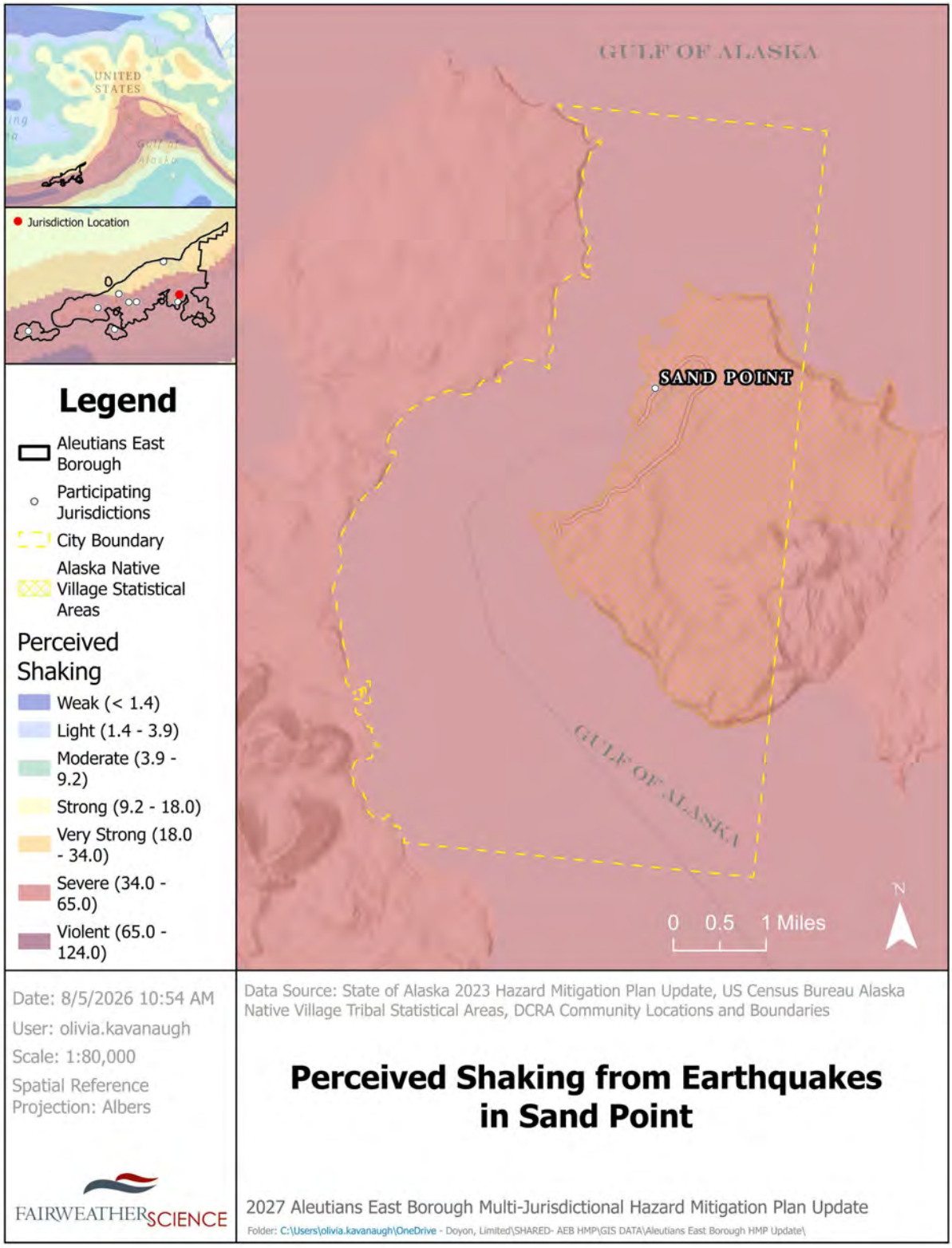



**Figure M-8 - Perceived Shaking from Earthquakes in Sand Point**

#### M.4.1.4.2 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including Unga Island and Sand Point can be found in Table of the Base Plan.

#### M.4.1.4.3 Extent (Magnitude and Severity)

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding Unga Island and Sand Point experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

The image below was submitted by a community member, who reported that this rock slide and split in the rock were due to an earthquake a few years ago. This is located near Unga Village on Unga Island.



Source: Amy Foster

**Figure M-9- Rock Slide and Split in Rock on Unga Island Reported Due to Earthquake**

Based on the extent of past earthquake events and the criteria identified in Table 5 in the Base Plan, the extent of earthquakes on Unga Island is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

Based on the extent of past earthquake events and the criteria identified in Table 5 in the Base Plan, the extent of earthquakes in Sand Point is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### M.4.1.4.4 Impact

Most earthquake injuries and fatalities occur within buildings from collapsing walls and roofs, flying glass, and falling objects. As a result, the extent of the Planning Area's risk depends not just upon its location relative to known faults, magnitude of the quake, distance from the epicenter and its underlying geology and soils, but also on the design of its structures. Buildings that have not been constructed to meet seismic

standards can pose major threats to life and the continued functioning of key public services during an earthquake. Earthquake damage would likely be area-wide with potential damage to critical infrastructure including the complete abandonment of critical facilities. Impacts to community and individual drinking water wells (specific water supply infrastructure damages), in addition to temporary or permanent aquifer or water source changes are also a potential consideration.

In the 2022 inspection of the Humboldt Creek Reservoir Dam, a crack in the earth embankment was observed. The damage was contributed to seismic activity near Sand Point (Terra Firma Testing 2022).

| | Description of Impacts |
|---|---|
| Geography/Land | The Planning Team did not report specific previous impacts due to earthquakes in this category in Unga Village or Sand Point. |
| Infrastructure | While owned by the City of Sand Point, Humboldt Creek Reservoir may still impact the Native Village of Unga staff, assets, or tribal members. The dam has cracks and damaged culverts due to earthquakes in the last 6 years (ADSE 2026). |
| People | The Planning Team did not report specific previous impacts due to earthquakes in this category in Unga Village or Sand Point. |
| Utilities | The Planning Team did not report specific previous impacts due to earthquakes in this category in Unga Village or Sand Point. |
| Transportation | The Planning Team did not report specific previous impacts due to earthquakes in this category in Unga Village or Sand Point. |
| Economy | There are no reported economic impacts due to earthquakes on Unga Island or in Sand Point. |
| Subsistence Resources | The Planning Team did not report specific previous impacts due to earthquakes in this category in Unga Village or Sand Point. |

#### M.4.1.4.5 Probability of Future Events

Unga Island and Sand Point is located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing Unga Island.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Highly Likely** that Unga Island will experience an earthquake of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Highly Likely** that Sand Point will experience an earthquake of any magnitude within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### M.4.1.4.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | The nature of earthquake events in Sand Point and on Unga Island is not anticipated to change in the future. |
| Location | The location of earthquake events in Sand Point and on Unga Island is not anticipated to change in the future. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of earthquakes in Sand Point and on Unga Island. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |

| Description of Future Conditions | |
|---|---|
| Impact | Future climate conditions are not expected to change the impact of earthquakes in Sand Point and on Unga Island. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future earthquake events in Sand Point and on Unga Island. Earthquakes are impossible to predict. |
| Population Patterns | Due to the unknown location of earthquake hazards in Sand Point and on Unga Island, it is possible that future earthquakes will impact future population patterns. Depending on the severity of the event, an earthquake in Sand Point could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Future climate conditions are not anticipated to influence Land Use Development due to earthquakes in Sand Point and on Unga Island. |
| Subsistence Resources | Future climate conditions are not anticipated to influence earthquake related impacts on subsistence resources in Sand Point and on Unga Island. |

### M.4.1.5 Flood

#### M.4.1.5.1 Location

The Planning Team reports that storm surge flooding in Sand Point occurs during extreme high tides (often referred to as king tides) and prevailing high winds.

It is unknown if snowmelt flooding impacts the Native Village of Unga.

The Planning Team reports that flooding due to rainfall run-off, from heavy, continuous rainfall, impacts Native Village of Unga residents in Sand Point.

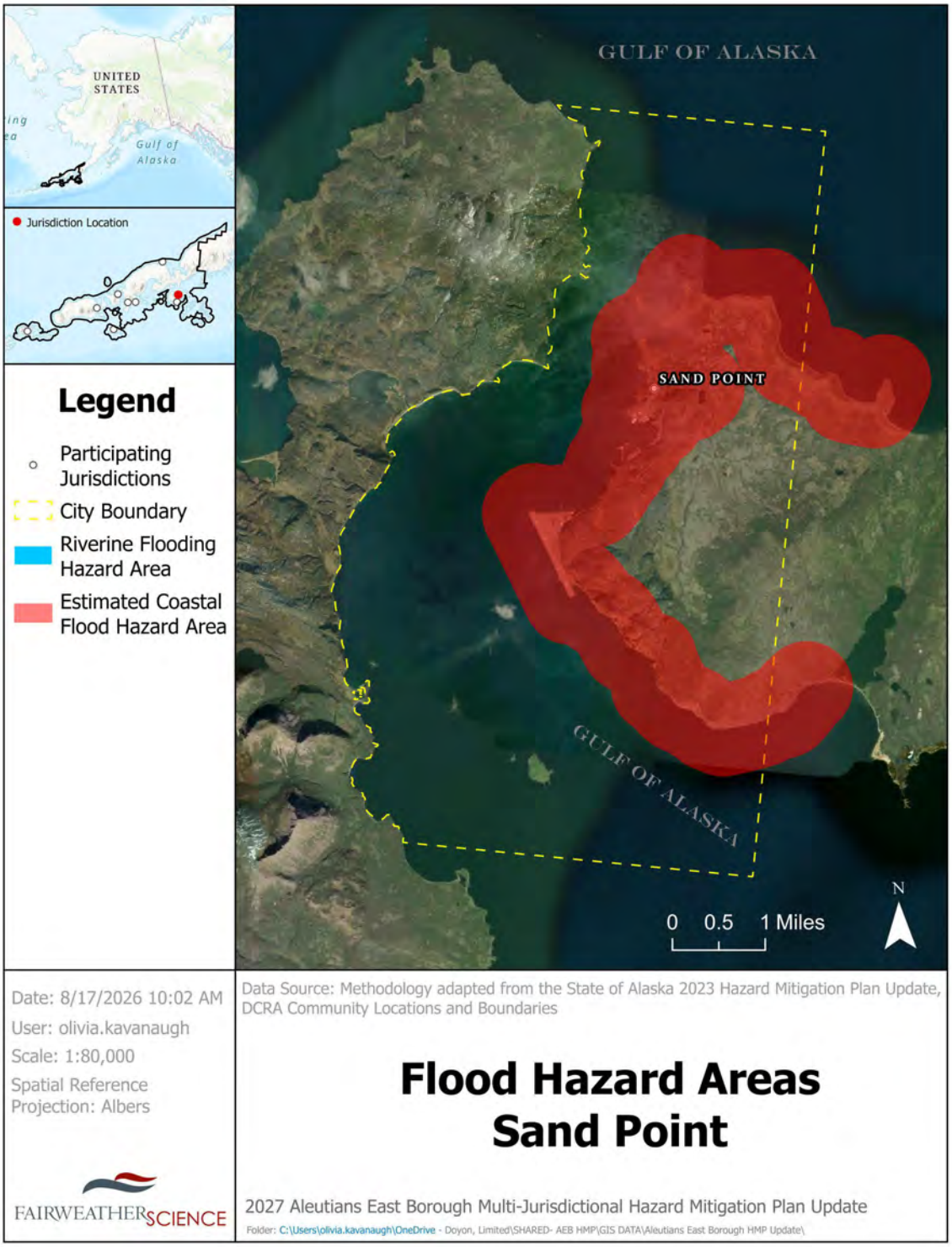
According to the previous HMP (2021), Sand Point reported minor flooding impacts from rainfall, snowmelt run-off, and storms. At that time, it was reported that water collects in low terrain depressions and may rise to just below of structure's first step with no water intrusion on the first floor.

According to the 2023 State of Alaska HMP, Sand Point and Unga Island are not identified as being located within an identified Coastal Flooding Hazard Area. As these are coastal communities and the Planning Team states that coastal flooding is a hazard, the same methodology used in the 2023 State of Alaska HMP was used to assess coastal flooding risk in Unga Village and Sand Point. The State of Alaska identifies coastal flooding hazard areas of 0.5 miles from the coastline (DHS&EM 2023).




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure M-10- Unga Village Flood Hazard Areas**




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure M-11- Sand Point Flood Hazard Areas**

#### M.4.1.5.2 History

Historical flood event information is not available for Unga Village or Unga Island.

MHHW represents the average height of the highest daily tide over a long observation period. Coastal flooding is likely when water levels exceed MHHW because it indicates that water has risen above the normal high tide line.

Historic high water level extremes above MHHW which exceeded the 10% annual exceedance probability are shown for Sand Point in the table below. Figure M-13 offers more context for this data.

**Table M-1- Historic Extremes Which Exceeded the 10% Annual Exceedance Probability Levels, Nov 1972 – June 2026**

| Date | Meters above MHHW | Feet above MHHW |
|---|---|---|
| **12/31/1986** | 1.33 | 4 |
| **11/5/2002** | 1.17 | 3.8 |
| **12/22/2022** | 1.41 | 4.6 |
| **1/22/2023** | 1.24 | 4.1 |

Source: NOAA/NOS/Center for Operational Oceanographic Projects and Services 2026

No historic flooding events were reported in Unga Village or Unga Island by the Planning Team.

#### M.4.1.5.3 Extent (Magnitude and Severity)

The Alaska DGGS Coastal Hazards Program reported that flood extent data is unavailable for the Aleutians East Borough at this time.

Flooding extent can be as shallow as several inches of water, to large powerful floods several feet in depth

The Denali Commission's Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest has the lowest vulnerability.

Sand Point received a Flood Threat Ranking of 59 out of 63 (Denali Commission 2019). While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking.

NOAA maintains a meteorological station in Sand Point, which was established in September 1972. This station includes wind, air temperature, water temperature, barometric pressure, tsunami WL and microwave ML sensors.

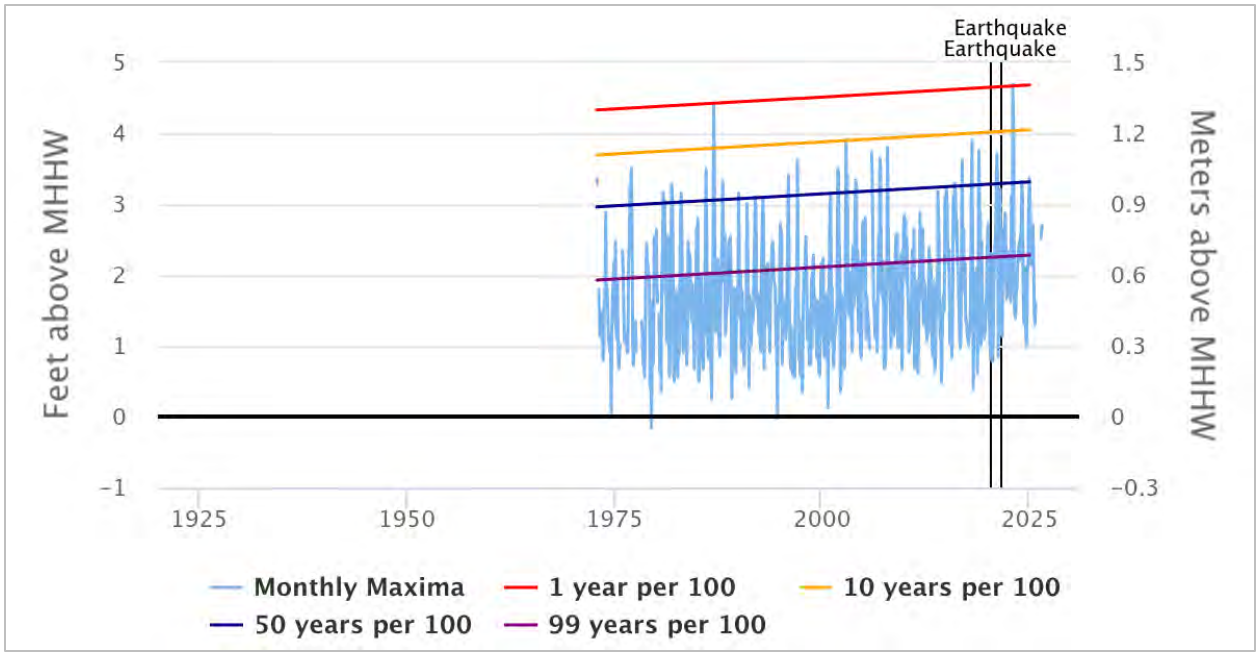


Source: NOAA/NOS/Center for Operational Oceanographic Products and Services 2026

**Figure M-12- Station 9459450 in Sand Point**

Figure M-13 shows monthly highest and lowest water levels, in meters above and below Mean Higher High Water (MHHW). **This data shows that December 2022 had the highest monthly water level above MHHW at 1.41 meters (4.6 feet) in the period from June 1973 to June 2026.**

The lines indicate annual exceedance probability levels. The purple line indicates a very common low water level with a high exceedance probability of 99 years per 100. The red line indicates a very rare high-water level that is only reached 1% of the time – 1 year in 100.




Source: NOAA/NOS/Center for Operational Oceanographic Projects and Services 2026

**Figure M-13- Extreme Water Levels for Sand Point, Alaska (9459450)**

According to this NOAA data source, "the monthly extreme water levels include a Mean Sea Level (MSL) trend of 1.83 millimeters/year with a 95% confidence interval of +/- 0.8 millimeters/year which is equivalent to a change of 0.60 feet in 100 years" (NOAA 2026).

Based on the extent of past flooding events and the criteria identified in Table 5 in the Base Plan, the extent of flooding in Unga Village is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

Based on the extent of past flooding events and the criteria identified in Table 5 in the Base Plan, the extent of flooding in Sand Point is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

### M.4.1.5.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team reports that storm surges can cause coastal land destabilization and sediment transport in Sand Point. No other specific previous impacts due to flooding were reported by the Planning Team in Unga Village or Sand Point. |
| Infrastructure | The Planning Team did not report specific previous infrastructure impacts in Unga Village or Sand Point due to flooding. |
| People | The Planning Team did not report specific previous impacts to people in Unga Village or Sand Point due to flooding. |
| Utilities | The Planning Team did not report specific previous utility impacts in Unga Village or Sand Point due to flooding. |
| Transportation | The Planning Team did not report specific previous transportation impacts in Unga Village or Sand Point due to flooding. |

| | Description of Impact |
|---|---|
| Economic | The Planning Team did not report specific previous economic impacts in Unga Village or Sand Point due to flooding. |
| Subsistence Resources | The Planning Team did not report specific previous subsistence impacts in Unga Village or Sand Point due to flooding. |

#### M.4.1.5.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Unga Village/Unga Island will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Sand Point will experience a flooding event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### M.4.1.5.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in the Unga Village and Sand Point Planning Area as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in the Unga Village and Sand Point Planning Area is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in the Unga Village and Sand Point Planning Area, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in the Unga Village and Sand Point Planning Area. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river |

| Description of Future Conditions | |
|---|---|
| | runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/erosion are expected to increase, with medium confidence (Ranasinghe et al., 2021).<br><br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. It is now rare for sea ice to form in the Unga Village and Sand Point Planning Area, however in certain areas it historically acted as this protective buffer. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |
| Population Patterns | It is possible that future flood events will cause changes in population patterns in the Unga Village and Sand Point Planning Area as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

### M.4.1.6 Ground Failure/Landslide

#### M.4.1.6.1 Location

Steep slopes, heavy precipitation, and saturated soils on Unga Island and in Sand Point pose a risk of landslides. Many landslide paths coincide with avalanche paths, especially at higher elevations. Unmapped areas within the Borough remain to be studied for landslide hazards and will be included in future updates of this plan as resources become available to evaluate those areas for landslide hazards.

Figure M-14 estimates avalanche hazard areas in Unga Village and Figure M-16 estimates avalanche hazard areas in Sand Point. Figure M-15 identifies locations of historical landslide events near Sand Point as reported in the DGGS Alaska Landslide Inventory, as of June 29, 2026.

As landslide hazard areas are not well defined in the community and detailed terrain data, such as LiDAR, were not available, ArcGIS Pro basemaps, including satellite imagery, topographic maps, and terrain data, were used to identify mountainous areas, elevation, and observable slope characteristics.

Potential landslide hazard areas were manually delineated based on these features (Figure 8). Where available, photographs of the surrounding geography were also reviewed to confirm the presence of steep slopes and other terrain characteristics indicative of potential landslide hazard.

***This assessment is intended to identify potential areas of landslide hazard at a planning level. It is not a substitute for site-specific landslide hazard mapping, geotechnical investigations, or detailed evaluation of local topography, and site-specific conditions. Areas identified through this assessment should be considered preliminary and should be subject to further investigation where development or other activities may be exposed to landslide hazards.***

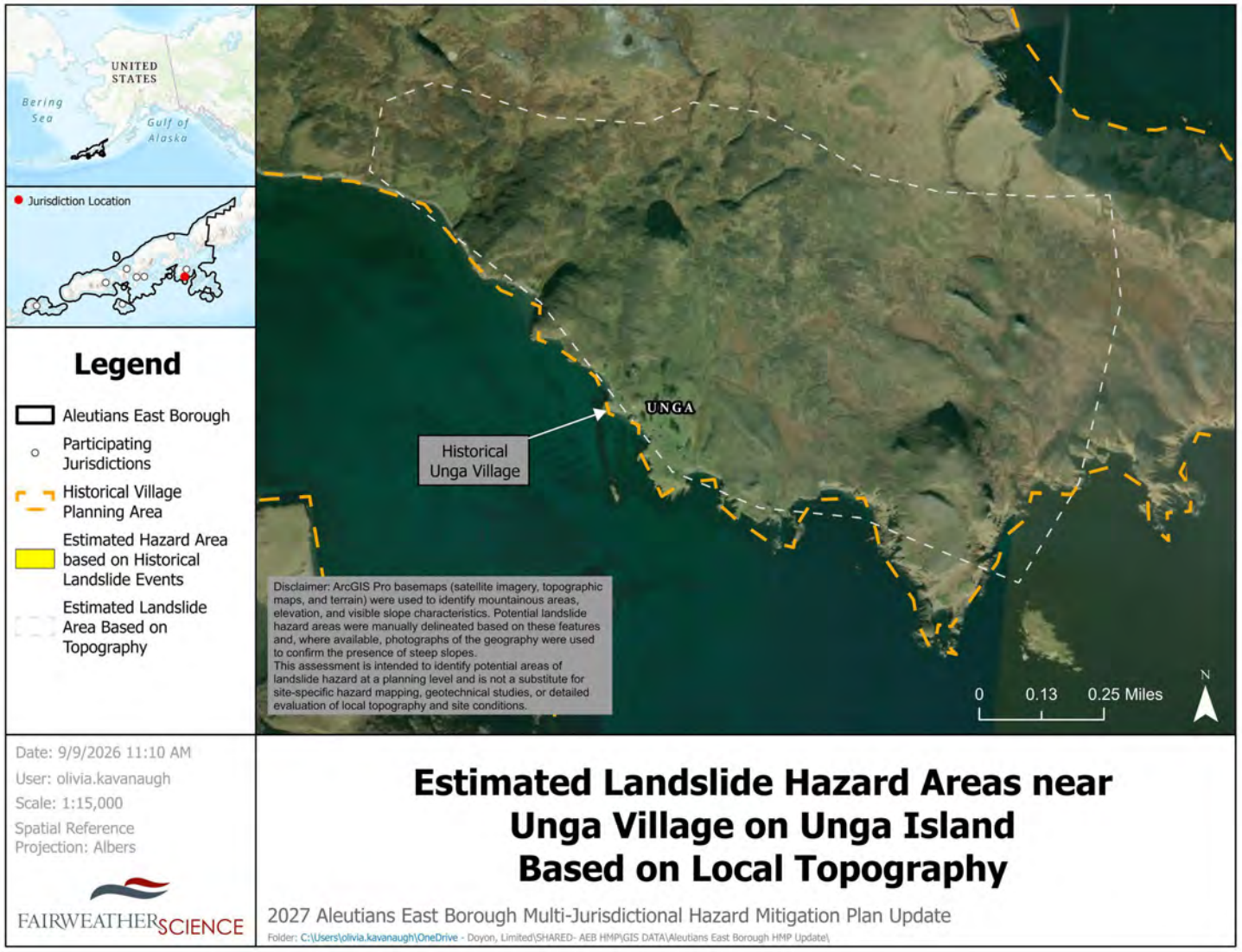



**Figure M-14- Estimated Landslide Hazard Areas near Unga Village**

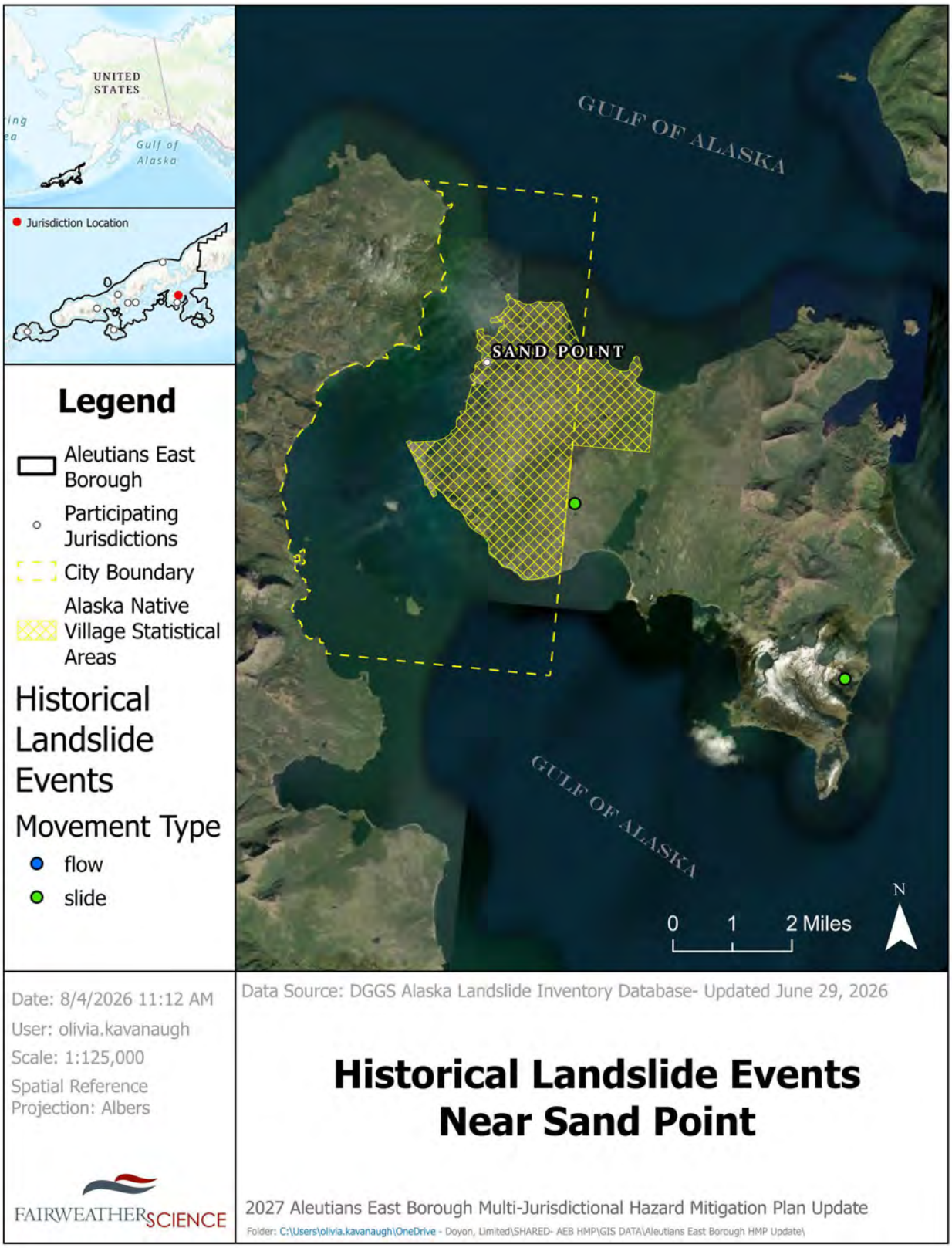



**Figure M-15 - Historic Landslide Events Near Sand Point**

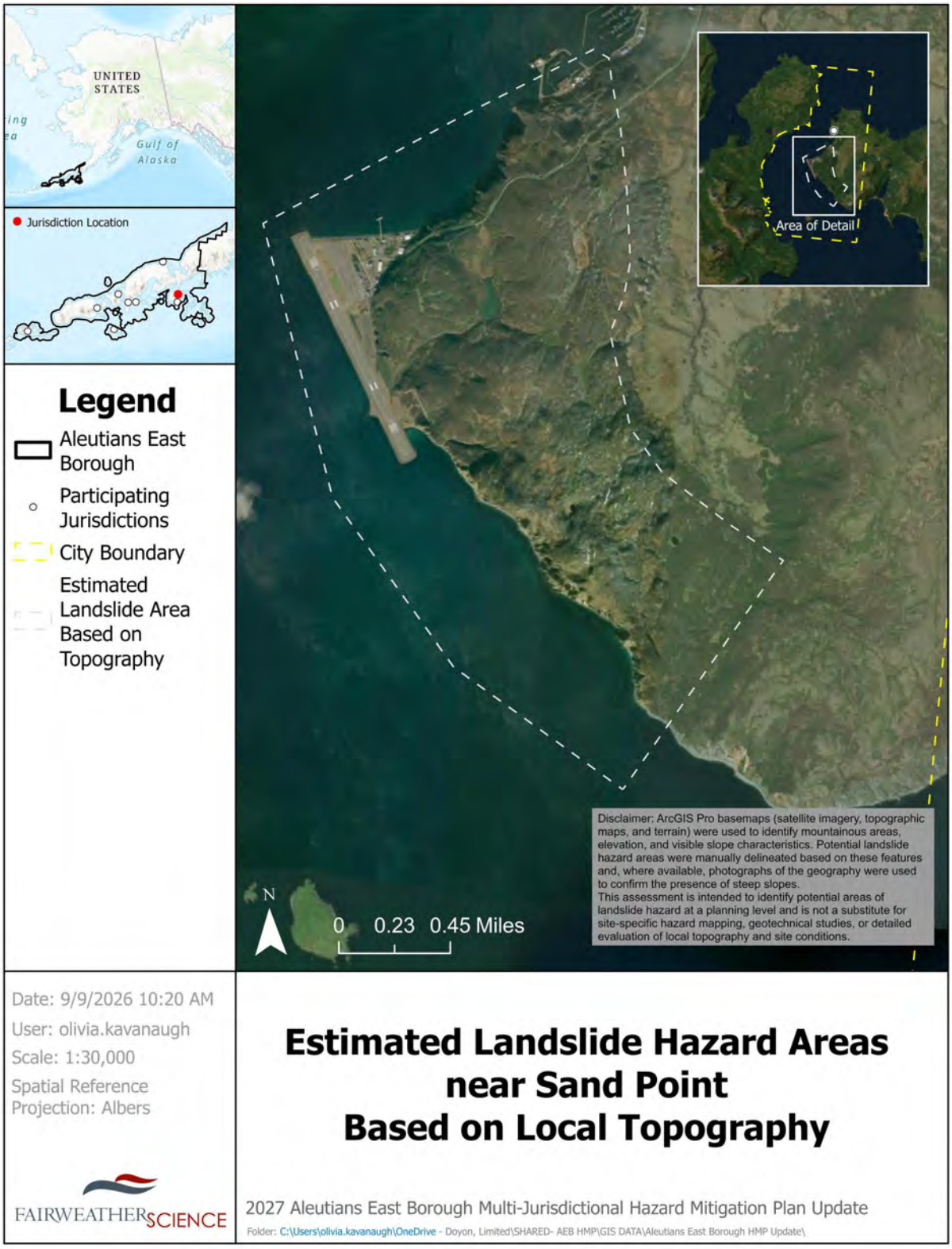



**Figure M-16- Estimated Landslide Hazard Areas in Sand Point**

#### M.4.1.6.2 History

There has been one (1) recorded landslide near the jurisdiction of Unga Village and Sand Point. The Alaska Landslide Inventory Database has no additional information other than classifying the event as a landslide and not a debris flow.

The April 1st, 1946, earthquake near Unimak Island (approximately 42 m east of Akutan, 35 miles west of Cold Bay and 45 miles east of King Cove) created a tsunami wave that reached all the way to Antarctica. For years, speculation existed that the large tsunami was aided by a submarine landslide due to the disproportionate waves created by the earthquake. In 1996, the USGS GLORIA discovered numerous slope failures (historic submarine landslides) along the eastern Aleutian Shelf. An exceptionally large failure was found at the location of the now named Ugamak Slide (Fryer, Watts, Patson 2004). The Ugamak Slide consists of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

If the Ugamak Slide did indeed occur on April 1st, 1946, it is likely that much of the seismic motion, especially at longer periods, was from the slide itself. A tectonic shock – a shallow subduction earthquake – was probably the trigger but differentiating it from the rest of the motion may prove impossible. The evidence for a landslide source to the 1946 tsunami is substantial (Fryer, Watts, Patson 2004).

#### M.4.1.6.3 Extent (Magnitude and Severity)

Subaerial landslides on sloped terrain in Unga Village and Sand Point pose a threat to critical facilities or human life. Subaerial landslides near bodies of water also pose a threat to critical facilities or human life as they may trigger a tsunami or seiche.

Landslides have been documented near bodies of water in the area around Sand Point- these events have the possibility to produce a tsunami or seiche. Ongoing monitoring and modelling of these areas is needed to identify if future subaerial landslides have the potential to trigger a tsunami. More information about tsunamis and seiches can be found in Section 3.2.10 in the Base Plan.

Based on the Alaska Landslide Inventory Database, it can be estimated that the historical landslides recorded in Unga Village and Sand Point range in width of less than 100 feet to over 500 feet.

A landslide (both submarine and subaerial) can trigger a tsunami. Due to Unga Island and Sand Point's location between the Bering Sea and the Pacific Ocean, and exposure to the open ocean, a submarine landslide-induced tsunami affecting the Planning Area in the future is a possibility. In the past, a submarine landslide created secondary hazards (tsunamis), that have impacted Sand Point or Unga Island.

The largest discovered underwater landslide deposit in the Aleutians East Borough is the Ugamak Submarine Slide. The Ugamak Submarine Slide consisted of many smaller slides, with the largest being 25 km wide and extends 65 km downslope.

Based on the extent of past sea ice events and the criteria identified in Table 5 in the Base Plan, the extent of landslides in the Unga Village is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past sea ice events and the criteria identified in Table 5 in the Base Plan, the extent of landslides in Sand Point is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### M.4.1.6.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | There is one recorded landslide event near the jurisdiction of the Native Village of Unga and Sand Point. Submarine landslides are also suspected of causing tsunami runups in Unga Village and Sand Point. |
| Infrastructure | The Planning Team did not report specific previous impacts in this category in Unga Village or Sand Point. |
| People | The Planning Team did not report specific previous impacts in this category in Unga Village or Sand Point. |
| Utilities | The Planning Team did not report specific previous impacts in this category in Unga Village or Sand Point. |
| Transportation | The Planning Team did not report specific previous impacts in this category in Unga Village or Sand Point. |
| Economy | The Planning Team did not report specific previous impacts in this category in Unga Village or Sand Point. |
| Subsistence Resources | The Planning Team did not report specific previous impacts in this category in Unga Village or Sand Point. |

#### M.4.1.6.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that the Unga Village will experience a landslide event in the calendar year. There is a 1 in 5 years chance of occurring (1/5 = 20%), and the history of subaerial landslide events is greater than 10% but less than or equal to 20% per year.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Sand Point will experience a landslide event in the calendar year. There is a 1 in 5 years chance of occurring (1/5 = 20%), and the history of subaerial landslide events is greater than 10% but less than or equal to 20% per year.

#### M.4.1.6.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of landslides in the future in Unga Village or Sand Point. |
| Location | It is possible that future climate conditions will influence the location of future landslides in Sand Point or Unga Island. Landslide probability is location specific, and numerous variables must be considered. It is common for debris flows to recur in the same channel or to shift slightly. Other types of landslides may reoccur in the same place or the area directly adjacent to a previous landslide. The AEB is located in a highly seismic area, which can trigger landslides at any time, and create areas prone to landslides that did not used to be.<br>Ground failures related to more frequent severe weather events, an increase in atmospheric rivers, and potential droughts are expected to appear in locations that were previously frozen and are now thawing. This includes areas that are immediately adjacent to recently thawed ground and where overlying vegetation has been removed. However, landslides also occur in areas with no prior known instabilities due to changing conditions such as increased rainfall, strong earthquake shaking, and human activities (DHS&EM 2023). |

| Description of Future Conditions | |
|---|---|
| Extent (Magnitude and Severity) | It is likely that future climate conditions will influence the magnitude of future landslides in Sand Point or Unga Island. Landslides are expected to increase in magnitude with increased areas of effect as severe weather events increase in frequency (IPCC 2019).<br>Future climate conditions are expected to increase landslide frequency of all intensities, and as people develop across the landscape, including into hazardous areas, there will likely be an increase in more significant outcomes in the future (DHS&EM 2023). |
| Impact | It is likely that future climate conditions will influence the impact of future landslides in Sand Point or Unga Island. Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from an increase in atmospheric rivers, severe weather events, and glacial decline (IPCC 2019), which could increase future ground failure events and resultant impacts. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of future landslides in Sand Point or on Unga Island. Although the probability of ground failure is location-specific, it is likely, and increasing, due to a changing climate. Severe weather events such as precipitation and wind are a direct result of atmospheric warming. Atmospheric rivers are becoming increasingly common and increase the intensity and duration of precipitation events at regional and local scales. Landslide events are directly related to high intensity precipitation events, and those are likely to become more common over greater geographic regions of Alaska (DHS&EM 2023). |
| Population Patterns | It is possible future climate conditions will influence population patterns in Sand Point or on Unga Island. Eventually, more of the resident population may be living in landslide hazard areas, however an increased growing season due to future climate conditions could lengthen the tourist season. An increase in tourists and seasonal workers throughout the year could possibly increase the number of people that are at risk of landslide hazards at any given moment. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Sand Point and on Unga Island. Limiting development and relocating existing development outside of landslide hazard areas would change the development in these areas. A landslide warning system could require infrastructure development, and more development outside of the landslide zones could increase land use to accommodate displaced residents. It is also possible that land developed in the future, or that has already been developed, may eventually become prone to landslide hazards. |
| Subsistence Resources | It is possible that future climate conditions will result in landslides impacting subsistence resources. Landslides could wipe out land access to certain parts of coastline, berry gathering locations, or trails leading to hunting or fishing grounds. |

### M.4.1.7 Invasive Species

#### M.4.1.7.1 Location

The entire natural area surrounding Unga Village or Sand Point is vulnerable to the spread of invasive species, particularly terrestrial invasive plants. Sand Point's location adjacent to a busy coastal port is a possible human-caused pathway in the spread of invasive species in the community. Invasive plant seeds can be transported unintentionally on vessels and cargo, potentially allowing species introduced near developed areas to spread into natural areas.

On Unga Island, several species of invasive terrestrial plants and animals have been documented, including:

- California Gilia
- Orange Hawkweed (as reported by the Planning Team)

Figure M-17 depicts the locations of documented invasive terrestrial plant species on Unga Island, as reported by community members in the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database.

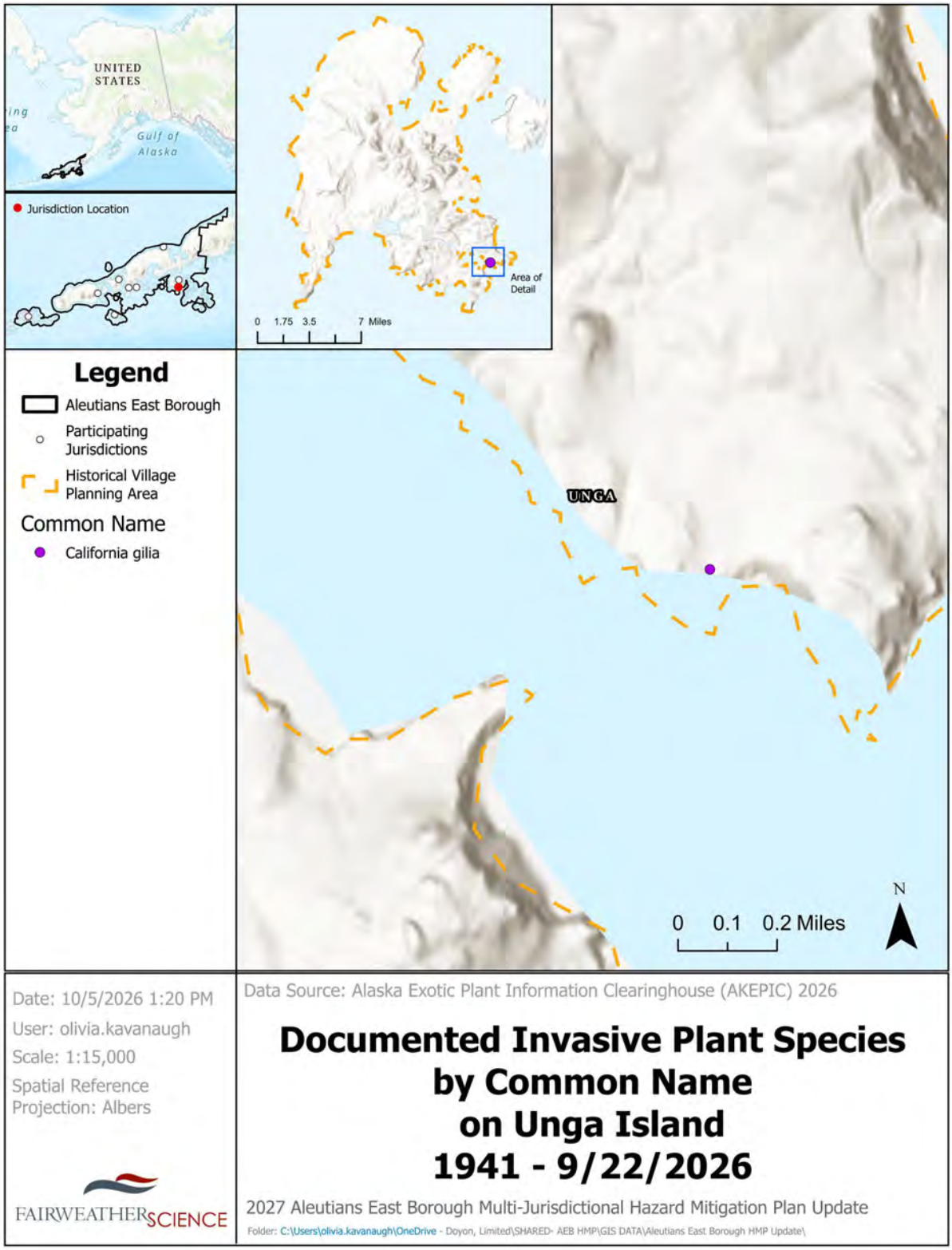



**Figure M-17- Documented Invasive Plant Species by Common Name on Unga Island**

#### M.4.1.7.2 History

Sand Point has had historical vessel traffic related to the fishing and shipping industry, which can contribute to the spread of invasive species in the region. While there have been no historical occurrences of invasive rat populations or invasive aquatic animals in the community, Sand Point has had a reported invasive plant occurrence, which was identified as the highly invasive Orange Hawkweed (USFWS 2026).

While there are no documented occurrences of invasive plants in Sand Point according to the AKEPIC database, this absence of records may be attributed to limited sampling and survey efforts in the area rather than an absence of invasive species.

In 1941, a small infestation of California gilia was reported near Unga Village. The Native Village of Unga Planning Team stated that is currently an infestation of Orange Hawkweed at Unga Village.

#### M.4.1.7.3 Extent (Magnitude and Severity)

While the threat of an invasive species event in Unga Village or Sand Point remains high, previous occurrences and knowledge of the magnitude and severity are currently limited.

The 1941 report of California gilia near Unga Village totaled 0.001 acres of infestation.

As there are no public-submitted entries of documented invasive species in Sand Point in the AKEPIC database, the total infested acreage in Sand Point is unknown.

Based on the extent of past invasive species events and the criteria identified in Table 5 in the Base Plan, the magnitude and severity to Sand Point from invasive species are considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the lack of invasive species data and the criteria identified in Table 5 in the Base Plan, the historical extent to Unga Village from invasive species are considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### M.4.1.7.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of invasive species on the land surrounding Unga Village and Sand Point has been localized non-native plant infestations, which can outcompete native plants and wildlife. |
| Infrastructure | There is limited evidence that invasive species have directly impacted infrastructure in Unga Village or Sand Point. |
| People | While invasive species can affect resources that people depend on, Unga Village or Sand Point has no history of invasive species directly affecting the residents of the community. |
| Utilities | There have been no documented cases of invasive species causing utility disruptions in Unga Village or Sand Point. |
| Transportation | Transportation is identified as a potential pathway for invasive species to spread throughout Unga Village or Sand Point. Due to the nature of invasive species in the community, there is little evidence to show that these species cause direct damage to transportation infrastructure in Unga Village or Sand Point. |
| Economy | There have been no reports of an invasive species infestation resulting in significant economic impacts in Unga Village or Sand Point. |

| | Description of Impact |
|---|---|
| Subsistence Resources | Invasive species pose a potential threat to subsistence resources in Unga Village or Sand Point, primarily related to the threat of non-native plants outcompeting native plants that residents rely on for subsistence activities. |

#### M.4.1.7.5 Probability of Future Events

Based on previous occurrences, and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Unga Village will experience an invasive species event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

Based on previous occurrences, and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Sand Point will experience an invasive species event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### M.4.1.7.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is possible future climate conditions will influence the nature of invasive species in Unga Village or Sand Point. Warmer temperatures and longer growing seasons may allow some invasive species to become established in areas where they don't historically occur. |
| Location | It is likely future climate conditions will influence the location of invasive species in Unga Village or Sand Point. Changes in temperature and precipitation patterns may allow invasive species to expand into new terrestrial and marine areas of Sand Point. |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of invasive species in Unga Village or Sand Point. Future changes may create favorable conditions for certain invasive species, allowing populations to spread at a rapid rate. |
| Impact | It is likely future climate conditions will influence the impacts of invasive species in Unga Village or Sand Point. |
| Probability of Future Events | It is likely future climate conditions will influence the probability of invasive species in Unga Village or Sand Point. As environmental conditions change, areas that were previously unsuitable for certain invasive species may become more favorable for establishment and spread, which increases the probability of future events in Unga Village or Sand Point. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Unga Village or Sand Point. Changes in the distribution and abundance of invasive species may alter the availability of food and habitat relied upon by wildlife and residents of Unga Village or Sand Point. |
| Land Use Development | It is unlikely future climate conditions will influence future land use development in Unga Village or Sand Point. |
| Subsistence Resources | It is likely future climate conditions will influence subsistence resources in Unga Village or Sand Point. Changes in ocean conditions, weather patterns, and species distribution may affect the availability and accessibility of important subsistence resources. The introduction or expansion of invasive species could further impact native species that support subsistence activities in Unga Village or Sand Point. |

### M.4.1.8 Sediment Deterioration and Land Destabilization

#### M.4.1.8.1 Location

Sediment deterioration and land destabilization can occur throughout Unga Village and Sand Point, with coastal land destabilization being the biggest concern for the community. Since Unga Village and Sand Point are classified as coastal areas, they are susceptible to shoreline destabilization. Coastal sediment deterioration and land destabilization is driven by storm surges, high winds, and severe storms that contribute to destabilization along the community's extensive coastline.

Riverine sediment deterioration and land destabilization isn't identified as a concern for Unga Village or Sand Point.

While the extent of sediment deterioration and land destabilization in Sand Point varies by location, many facilities like the harbor may be increasingly vulnerable to future destabilization.

#### M.4.1.8.2 History

The history of coastal sediment deterioration and land destabilization in Sand Point varies by location due to the localized nature of storms in the community. According to a Native Village of Unga Planning Team member, the shorelines surrounding the community with sandy areas experiences impacts from coastal sediment deterioration and land destabilization.

#### M.4.1.8.3 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of sediment deterioration and land destabilization vary throughout select communities. In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk. Sand Point was categorized in erosion Group 3, which places it at a lower risk of sediment deterioration and land destabilization according to the study.

According to the Native Village of Unga Planning Team, the shorelines surrounding the community with sandy areas experiences impacts from coastal sediment deterioration and land destabilization.

Based on the historical extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 in the Base Plan, the historic extent of sediment deterioration and land destabilization in Unga Village is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 in the Base Plan, the extent of sediment deterioration and land destabilization in Sand Point is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

#### M.4.1.8.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of sediment deterioration and land destabilization on the land surrounding Unga Village and Sand Point has been damages to shoreline and beaches, particularly along areas exposed to waves and storms. In Unga Village, impacts from destabilization have been documented along shorelines with sandy areas. |
| Infrastructure | Impacts to infrastructure from sediment deterioration and land destabilization in Unga Village or Sand Point have been historically limited. Future sediment |

| Description of Impact | |
|---|---|
| | deterioration and land destabilization could threaten additional community infrastructure and increase mitigation costs. |
| People | While sediment deterioration and land destabilization can affect residents of Unga Village or Sand Point by threatening homes and access to subsistence areas, direct impacts to people in Unga Village or Sand Point resulting from sediment deterioration and land destabilization have been limited. |
| Utilities | There have been no documented impacts to the utilities in Sand Point from sediment deterioration and land destabilization events. There are no utilities in Unga Village that can be impacted by sediment deterioration and land destabilization events. |
| Transportation | The primary transportation related impacts from a sediment deterioration and land destabilization event in Sand Point are damage to roads, boardwalks, and other transportation infrastructure. There have been no reports of sediment deterioration and land destabilization resulting in substantial disruptions to transportation in Unga Village or Sand Point. |
| Economy | There are a substantial number of roads in Sand Point that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities. There are no recorded economic impacts in Unga Village from sediment deterioration and land destabilization events. |
| Subsistence Resources | A primary concern related to subsistence resources in Unga Village or Sand Point is the loss of subsistence fish camps that have been used for generations, which have the potential to be washed-out or the access restricted during a storm. |

#### M.4.1.8.5 Probability of Future Events

The coastal geography influences the likelihood of continued sediment deterioration and land destabilization in Unga Village and Sand Point.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Unga Village will experience a sediment deterioration and land destabilization event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Sand Point will experience a sediment deterioration and land destabilization event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### M.4.1.8.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in Unga Village or Sand Point. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in Unga Village or Sand Point. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and ultimately accelerate coastal land destabilization in Unga Village or Sand Point (AK DGGS 2026). |

| Description of Future Conditions | |
|---|---|
| Extent (Magnitude/Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in Unga Village or Sand Point. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in Unga Village or Sand Point. Projected increases in precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in Unga Village or Sand Point. Although the probability for land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Unga Village or Sand Point. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of Unga Village or Sand Point entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Unga Village or Sand Point. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in Unga Village or Sand Point. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

### M.4.1.9 Severe Weather

The Native Village of Unga Planning Team reports experiencing severe weather, including high wind, heavy/drifting snow, freezing rain/ice storm, and extreme cold events.

#### M.4.1.9.1 Location

All of Unga Village and Sand Point are vulnerable to severe weather events.

#### M.4.1.9.2 History

Unga Village and Sand Point have a history of high wind events and winter storms. See the Base Plan for severe weather history in the Aleutians East Borough Planning Area.

#### M.4.1.9.3 Extent (Magnitude and Severity)

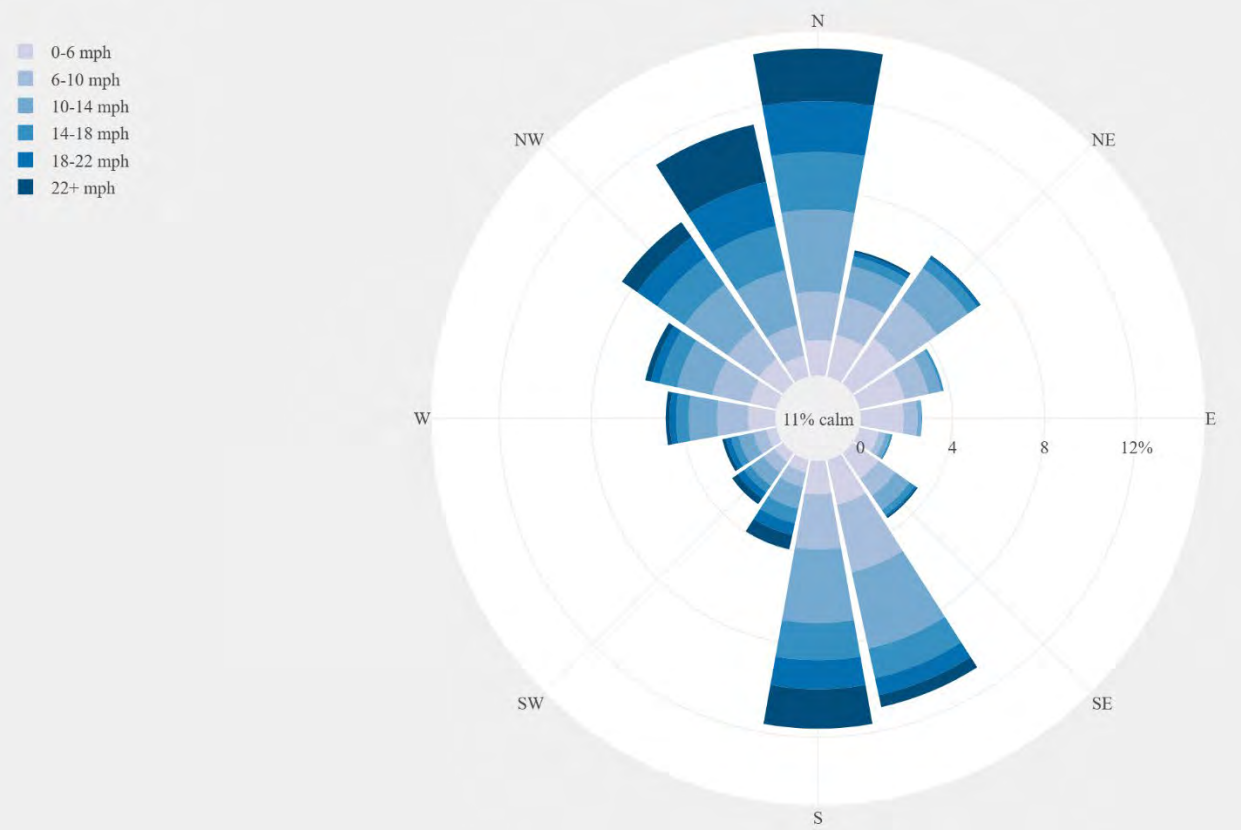
Table M-2 shows monthly averages for maximum temperature, minimum temperature, total precipitation, average total snowfall, and snow depth from 1980 to 1994 in Sand Point. This detailed information is not available for Unga Village.

**Table M-2- Monthly Climate Summary 6/1/1980-6/30/1994, Sand Point**

| | Jan | Feb | Mar | April | May | June | July | Aug | Sept | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Avg.Max. Temp (F)** | 36.2 | 34.9 | 37.7 | 39.2 | 45.3 | 51.9 | 57.5 | 57.6 | 53.9 | 46.6 | 41.3 | 38.6 | 45.1 |
| **Avg. Min. Temp (F)** | 29.0 | 27.0 | 28.9 | 30.6 | 36.4 | 41.8 | 46.8 | 48.1 | 44.1 | 37.6 | 33.2 | 31.3 | 36.2 |
| **Avg. Total Precipitation (in.)** | 3.88 | 2.60 | 3.26 | 2.41 | 3.03 | 3.15 | 2.87 | 4.01 | 6.32 | 3.89 | 3.47 | 5.79 | 44.68 |
| **Avg. Total Snowfall (in.)** | 5.6 | 1.8 | 1.5 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 2.0 | 12.9 |
| **Avg. Snow Depth (in.)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: WRCC 2026

Average wind speeds in Sand Point are highest in the winter months, according to the Western Regional Climate Center. Figure M-18 below illustrates average wind speeds and directions at the Sand Point Airport over the course of the year from 1980-2025, demonstrating that wind speeds do reach 22+ mph.




Source: UAF SNAP & WRCC 2025

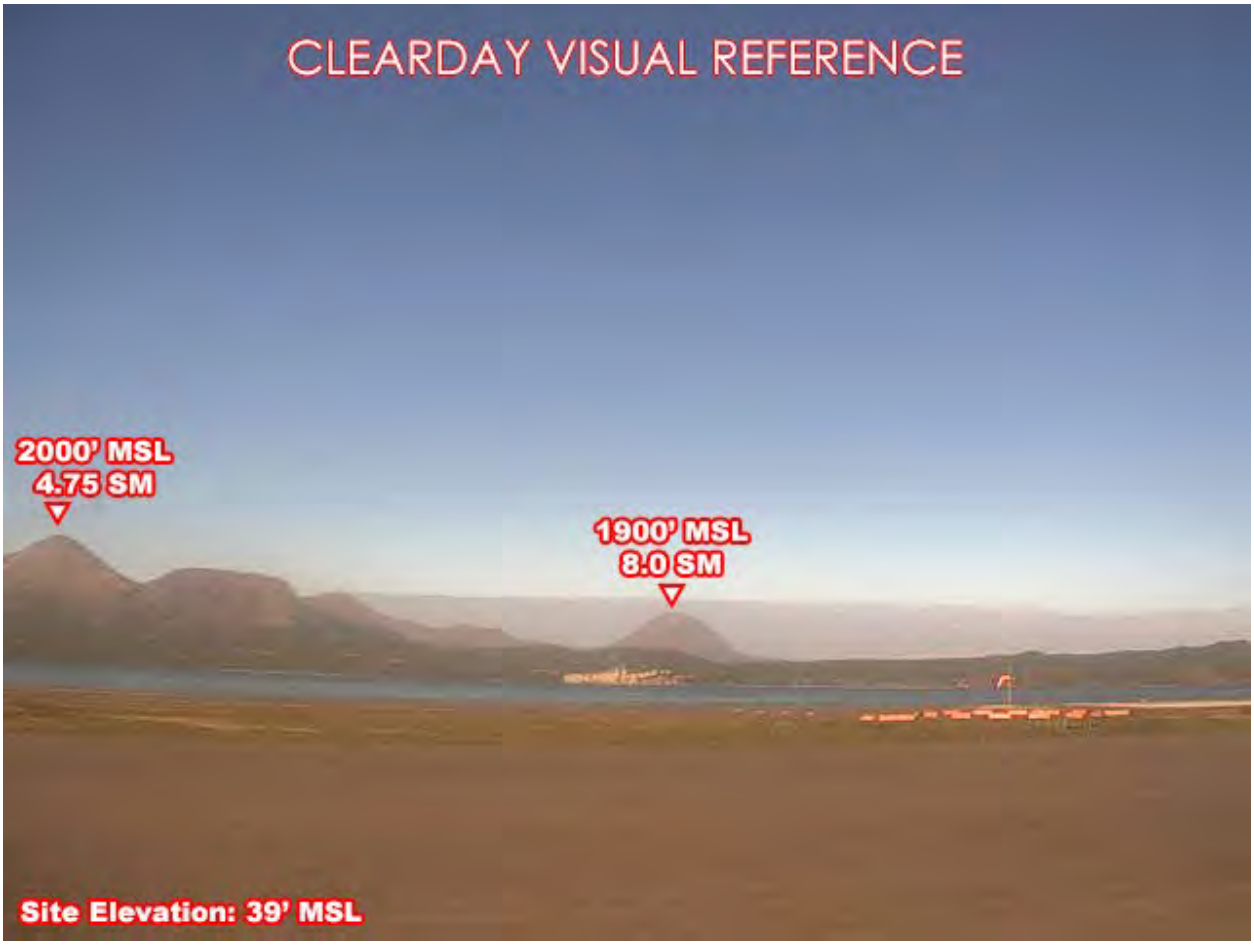
**Figure M-18- Wind Speed/Direction Distribution for Sand Point Airport, 1980-2025**

Dense fog can disrupt travel at the Sand Point Airport. The Federal Aviation Administration monitors weather cameras at the Sand Point Airport. Below are images of an overcast day and a clear day visual reference. These images are from August 13, 2026, and are intended to provide a qualitative visual reference of the impact of weather on visibility at the airport.




Source: FAA WeatherCams 2026

**Figure M-19- Sand Point Airport on 8/13/2025, Facing West**




Source: FAA WeatherCams 2026

**Figure M-20- Sand Point Airport on 8/13/2025, Facing West, Clear Day**

Based on the extent of past severe weather events and the criteria identified in Table 5 in the Base Plan, the extent of severe weather events in Unga Village is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

Based on the extent of past severe weather events and the criteria identified in Table 5 in the Base Plan, the extent of severe weather events in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### M.4.1.9.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | General severe weather impacts to geography/land include:<br>Dense Fog: Persistent marine fog can contribute to slick conditions on coastal trails and roads.<br>Drought: Drought conditions can impact subsistence resources, ecosystem functions, and increase wildfire risk. Drought can dry out tundra and reduce lake levels.<br>Extreme Cold: Extended cold spells can cause ice buildup on coasts and tundra and potentially increase freeze-thaw damage. |

| | Description of Impact |
|---|---|
| | Heavy Rain: Heavy rain can cause land destabilization, sediment transport, and flooding. Heavy rain also increases landslide and debris-flow potential in steep terrain. Saturated soils can destabilize slopes.<br>Heavy Snow: Heavy snow can alter flooding and melt patterns, impacting trail access and distribution of flora and fauna.<br>High Winds: High winds drive wave runup, worsening storm impacts such as land destabilization.<br>**The Planning Team did not report any specific previous impacts to geography/land from severe weather events in Unga Village or Sand Point.** |
| Infrastructure | General severe weather impacts to infrastructure in this region can include:<br>Dense Fog: Dense fog can indirectly impact physical infrastructure by causing delays in repairs and reducing safe operation of equipment and infrastructure such as small harbors.<br>Drought: Drought can impact water system intakes and increase wear on community water infrastructure<br>Extreme Cold: Extreme cold can cause infrastructure and home damage when pipes freeze or extreme cold impacts mechanical systems. In extreme cold conditions, frozen pipes, equipment failures, and structural strain can occur more frequently.<br>Heavy Rain: Heavy rain can overwhelm drainage and flood protection systems, causing localized flooding. It can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, bulk fuel storage, docks, landfills, cemeteries, and homes. Freezing rain can cause damage to infrastructure (tree limbs with freezing rain can damage power lines, ice buildup can damage water conveyance systems).<br>Heavy Snow: Heavy snow can load roofs and structures, increasing the risk of damage or collapse.<br>High Winds: High wind can cause infrastructure and home damage, such as damage to roofing, utility lines, docks, and fuel storage.<br>**The Planning Team reported that high winds have caused damage to buildings in Sand Point. No specific previous impacts were reported in Unga Village.** |
| People | General impacts to people from severe weather can include:<br>Dense Fog: Dense fog can interrupt travel and affect access to critical medical care. Reducing visibility, dense fog can increase the risk of injury, especially in settings such as boat harbors and fishery facilities where operational hazards are already present.<br>Drought: Water shortages can impact drinking water security and increase wildfire risk, presenting risks to human health and safety.<br>Extreme Cold: Extreme cold events pose dangers to human health, including frostbite and hypothermia. Extreme cold can also lead to heating emergencies for residents, such as being without heat for extended periods of time.<br>Heavy Rain: Heavy rain can flood homes, increase the risk of mold, other health risks, and displacement.<br>Heavy Snow: Heavy snow can make mobility difficult for people, especially those with mobility impairments. Heavy snow can also increase the risk of injury and social isolation, especially for elders.<br>High Winds: High winds can occur any time of year. In the winter, high winds associated with winter storms can lead to dangerous wind. High winds can lead |

| | Description of Impact |
|---|---|
| | to dangerous driving, boating, and general transportation conditions for people, leading to isolation and reduced access to community and healthcare services. Flying debris increases injury risk. Home damage from high winds impacts housing security.<br>**The Planning Team did not report specific instances of personal injury or death related to severe weather in Unga Village or Sand Point.** |
| Utilities | General impacts to utilities from severe weather events can include:<br>Dense Fog: Dense fog can slow maintenance work and complicate utility inspections.<br>Drought: Drought can strain community water systems and reduce availability of drinking water from lakes, streams, or reservoirs. It can also drive up the cost of water treatment.<br>Extreme Cold: These events, especially when prolonged, can increase energy demand. Extreme cold can freeze lines and increase the need for utility repairs.<br>Heavy Rain: Heavy rain can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, bulk fuel storage, docks, landfills, cemeteries, and homes. Freezing rain can cause damage to powerlines and pipelines. Heavy rain can increase contamination risk if and when floodwaters breach utility infrastructure such as sewage lagoons.<br>Heavy Snow: Heavy snow can cause power disruptions and delay deliveries of utility-related materials such as fuel.<br>High Winds: High winds can knock down trees and powerlines, directly or indirectly damaging utility infrastructure and potentially causing prolonged power outages.<br>**The Planning Team reported that extreme cold events froze pipes, impacting water and sewer utilities. No specific previous impacts were reported in Unga Village.** |
| Transportation | General severe weather impacts to transportation in this region can include:<br>Dense Fog: Dense fog reduces aviation and marine visibility, causing delays and cancellations. Fog can also impact emergency response and medevac operations.<br>Drought: Extreme drought can contribute to low water levels in rivers and bays, potentially limiting navigability. Dust can lead to road degradation.<br>Extreme Cold: Extreme cold can disrupt transportation and complicate emergency response. Specifically, extreme cold can reduce vehicle reliability and lead to aircraft delays.<br>Heavy Rain: Heavy rain can cause land destabilization and sediment transport, threatening infrastructure such as roads, runways, and docks. Roads and runways can wash out or otherwise become impassible, limiting travel in and out of villages.<br>Heavy Snow: Heavy snow can block roads and runways, impede emergency response and delay freight and transportation. When combined with high wind conditions, blinding blizzards that impede transportation may occur.<br>High Winds: High winds can create dangerous marine conditions, disrupting freight and travel. Airplanes and medevac flights will not fly above certain wind speed thresholds. High winds increase turbulence hazards.<br>**The Planning Team did not report any specific previous impacts to transportation from severe weather events in Unga Village or Sand Point.** |
| Economy | General severe weather impacts to the economy can include:<br>Dense Fog: Dense fog can disrupt fishing and transport-dependent economic activities. |

| | Description of Impact |
|---|---|
| | Drought: Low water availability can stress fisheries and increase costs related to water utilities and wildfires.<br>Extreme Cold: Extreme cold can increase heating costs, burdening households and businesses. Other economic activities such as marine activity may decline in periods of extreme cold.<br>Heavy Rain: Heavy rain related damages raise repair costs for homeowners, local governments, and local businesses.<br>Heavy Snow: Heavy snow events increase costs related to snow removal. Heavy snow events can delay freight and transportation.<br>High Winds: High wind events can interrupt fishing and shipping activities. Wind-related damage can be expensive to repair.<br>**The Planning Team did not report any specific previous economic impacts from severe weather events in Unga Village or Sand Point.** |
| Subsistence Resources | General severe weather impacts to subsistence resources can include:<br>Dense Fog: Fog can reduce visibility during subsistence activities, such as marine or travel to subsistence sites.<br>Drought: Drought conditions can impact subsistence resources, ecosystem functions, and increase wildfire risk.<br>Extreme Cold: Extreme cold can impact winter hunting and subsistence activities. It can change the timing of subsistence harvest activities.<br>Heavy Rain: Heavy rains can impact the availability and timing of subsistence species. Flooding can impede access to subsistence areas.<br>Heavy Snow: Heavy snow can impact wildlife movement, slow human travel, and impact subsistence species such as berries.<br>High Winds: High winds can impact transportation associated with subsistence activities. High winds and other severe weather events can damage subsistence equipment, such as boats and drying racks.<br>**The Planning Team did not report any specific previous impacts to subsistence resources from severe weather events in Unga Village or Sand Point.** |

### M.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Highly Likely** that Unga Village will experience a severe weather event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Highly Likely** that Sand Point will experience a severe weather event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### M.4.1.9.6 Future Climate Conditions

**Projected Conditions for Unga (Uĝnaasaqax̂)**

In Unga (Uĝnaasaqax̂), average annual temperatures may increase by about 9°F by the end of the century.

Winter temperatures are projected to increase the most (+9°F).

Models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026).

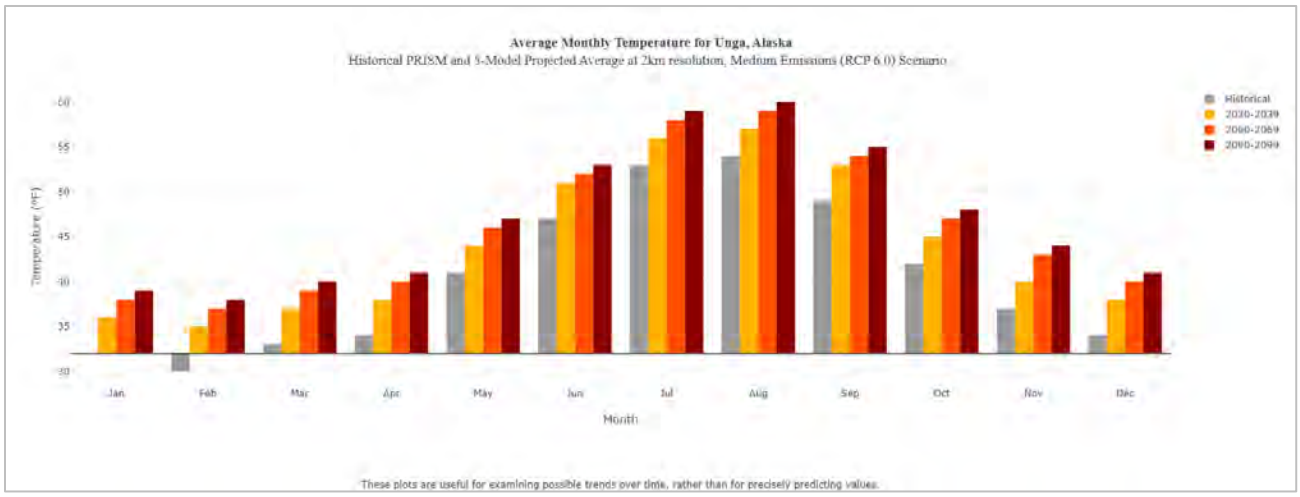
*Source: UAF/SNAP 2026- Northern Climate Reports*

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in the Sand Point and Unga Village Planning Area. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in the Sand Point and Unga Village Planning Area. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in the Sand Point and Unga Village Planning Area. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in the Sand Point and Unga Village Planning Area. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in the Sand Point and Unga Village Planning Area. | It is unlikely that future climate conditions will influence the nature of future high wind events in the Sand Point and Unga Village Planning Area. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in the Sand Point and Unga Village Planning Area. | It is possible that future climate conditions will influence the location of future drought/water supply events in the Sand Point and Unga Village Planning Area. | It is unlikely that future climate conditions will influence the location of future extreme cold events in the Sand Point and Unga Village Planning Area. | It is unlikely that future climate conditions will influence the location of future heavy rain events in the Sand Point and Unga Village Planning Area. | It is unlikely that future climate conditions will influence the location of future heavy snow events in the Sand Point and Unga Village Planning Area. | It is unlikely that future climate conditions will influence the location of future high wind events in the Sand Point and Unga Village Planning Area. |
| Extent | Due to a projected increase in future precipitation in the Sand Point and Unga over the next few decades, the magnitude and severity of dense fog events in the Planning Area could increase (UAF/SNAP 2025). | In Unga, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026). Winter temperatures are increasing the most (+9°F) (UAF/SNAP 2026). Climate change within Alaska is likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In Unga, average annual temperatures may increase by about 9°F by the end of the century (UAF/SNAP 2026). Winter temperatures are increasing the most (+9°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026).<br>Temperatures are also projected to increase over the course of the century in Sand Point (UAF/SNAP 2026). However, year-to-year variability is still likely, with extreme cold events possible. | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in Unga Village and Sand Point. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP). Extreme precipitation events have occurred throughout Alaska with increasing frequency. In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). Precipitation is expected to increase, especially in the winter months, in both Unga Village and Sand Point (UAF/SNAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026). While models have a higher uncertainty regarding precipitation, winter is likely to have more precipitation in Unga (+24%) (UAF/SNAP 2026).<br>The Aleutians East Borough Planning Area experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months.<br>Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). |
| Impact | Projected increases in precipitation and associated moisture availability in the Planning Area could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026). Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, | Overall temperature trends in Unga and Sand Point are projected to increase; with estimated winter temperature increases in Unga of approximately +9°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain | While overall temperature trends in Unga Village and Sand Point are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme | In Unga Village, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026). Impacts from more heavy rain events include flooding, land destabilization, and damage to critical infrastructure such as road washouts. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023). Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | marine navigation, and roadway travel. | possible in Unga Village and Sand Point (Alaska DHS&EM 2023). | cold events remain possible for communities in the Aleutians East Borough. | | falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir levels. The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in the Sand Point and Unga Village Planning Area by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in Unga Village and Sand Point are projected to increase; with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In Unga, models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in Unga Village and Sand Point are projected to increase, with estimated winter temperature increases of approximately +9°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In Unga Village and Sand Point, winter is likely to have more precipitation (UAF/SNAP 2026). Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in the Aleutians East Borough Planning Area may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in the Aleutians East Borough Planning Area have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in Unga Village or Sand Point. | Future conditions of drought are not anticipated to significantly affect population patterns in Unga Village or Sand Point. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in Unga Village or Sand Point. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | It is possible that future conditions influencing heavy rain will impact changes in population patterns, as people choose to live farther from floodable low-lying lands. | It is not likely that future conditions influencing heavy snow will impact changes in population patterns in Unga Village or Sand Point. | It is not likely that high winds will influence future population patterns in Unga Village or Sand Point. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in Unga Village or Sand Point. | Future conditions of drought are not anticipated to substantially affect future land use development in Unga Village or Sand Point. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in Unga Village or Sand Point, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is possible that future conditions of heavy rain will impact changes land use development in Unga Village or Sand Point. An increase in frequency of heavy rains could oversaturate soil on slopes, leading to an increase in frequency and magnitude and severity of landslides. This could | It is not likely that future conditions influencing heavy snow will impact changes in land use development in Unga Village or Sand Point. | It is not likely that future conditions of high winds will impact changes in land use development in Unga Village or Sand Point. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | alter where new developments would be deemed safe and/or possible. Land use may also change due to development of landslide monitoring equipment and/or landslide barriers/diversion structures. | | |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in Unga Village or Sand Point. | Future conditions of drought may affect subsistence resources in Unga Village or Sand Point, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity. Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | Future conditions of extreme cold may affect subsistence resources in Unga Village or Sand Point, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity. Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | It is possible that future conditions of heavy rain will impact changes in subsistence resource access in Unga Village and Sand Point, as flooded areas block access to traditional harvesting areas. | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, thermal stress, and nutrient availability for subsistence species. | It is not likely that future conditions of high winds will impact changes in subsistence resources in Unga Village or Sand Point. |

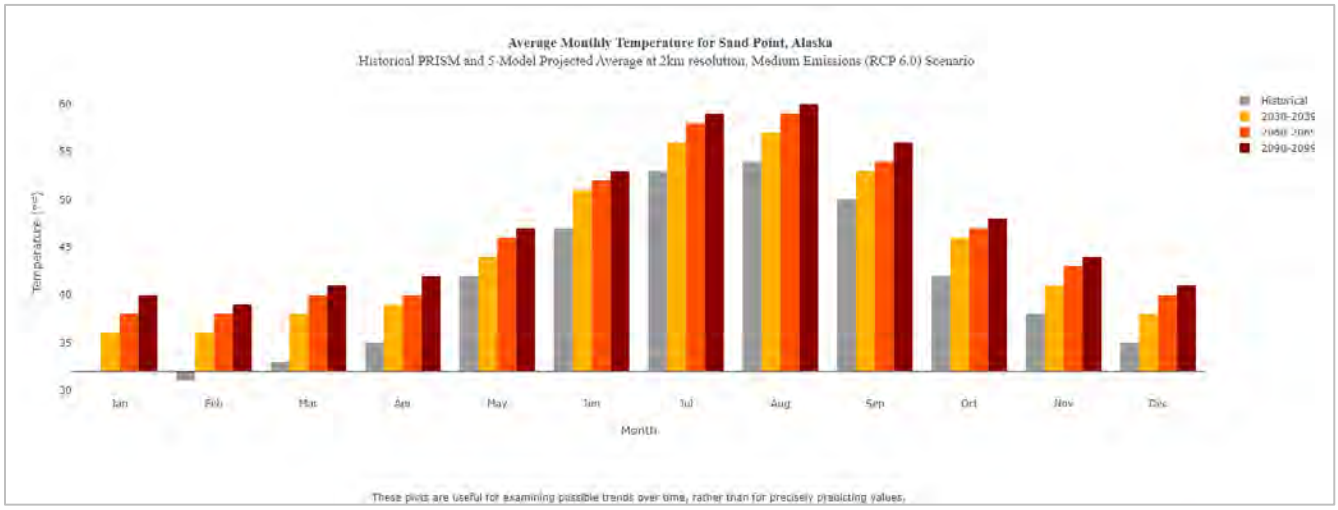
Figure M-21 shows average monthly temperatures for Unga, Alaska historically and through 2099 under a Medium Emissions (RCP 6.0) Scenario. This shows an increase in temperature across all months of the year.




Source: UAF/SNAP 2026

**Figure M-21- Average Monthly Temperature for Unga, Alaska**

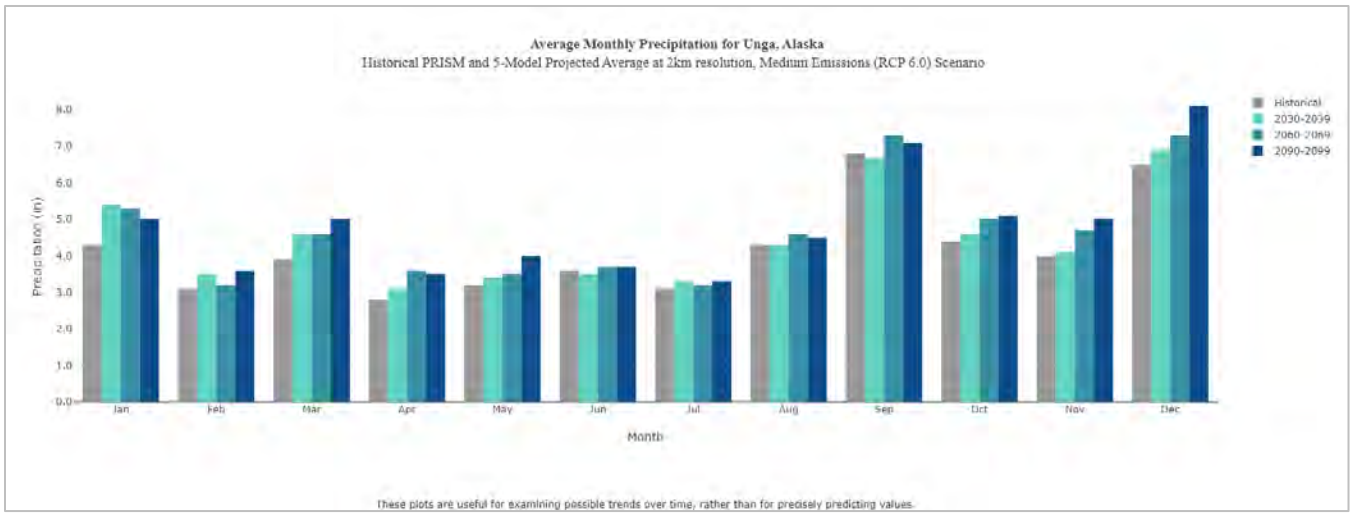
Figure M-22 shows a similar trend for average monthly temperature in Sand Point (UAF/SNAP 2026).




Source: UAF/SNAP 2026

**Figure M-22- Average Monthly Temperature for Sand Point, Alaska**

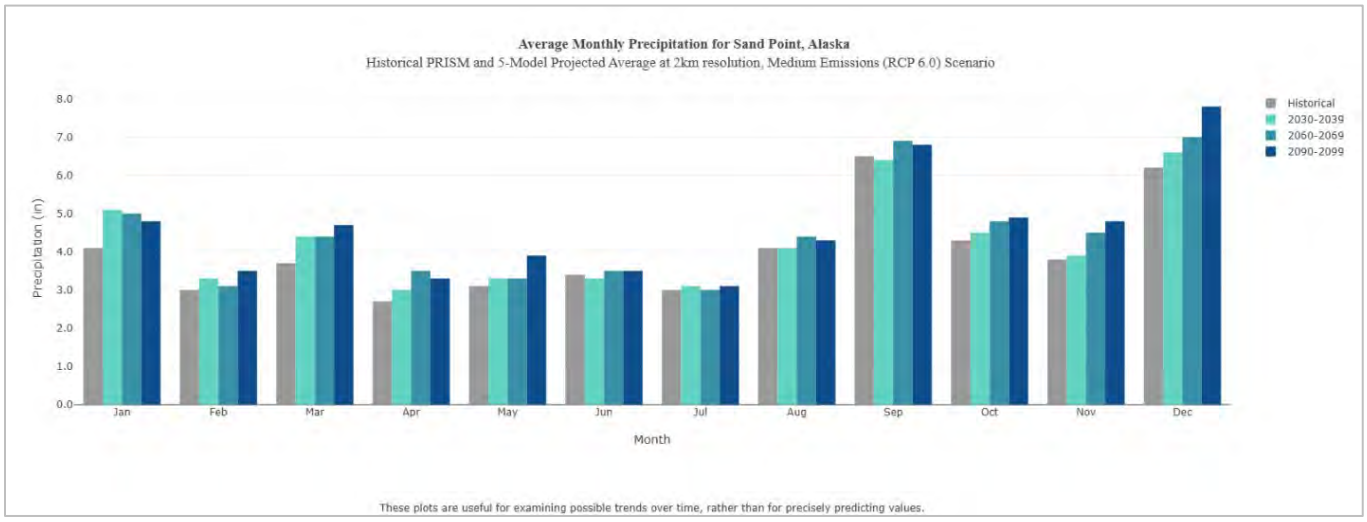
Figure M-23 shows average monthly precipitation for Unga, Alaska historically and through 2099 under a medium emissions (RCP 6.0) scenario (UAF/SNAP 2026). It shows a general increase in monthly precipitation over time from historical baselines, with some nuance shown.




Source: UAF/SNAP 2026

**Figure M-23- Average Monthly Precipitation for Unga, Alaska**

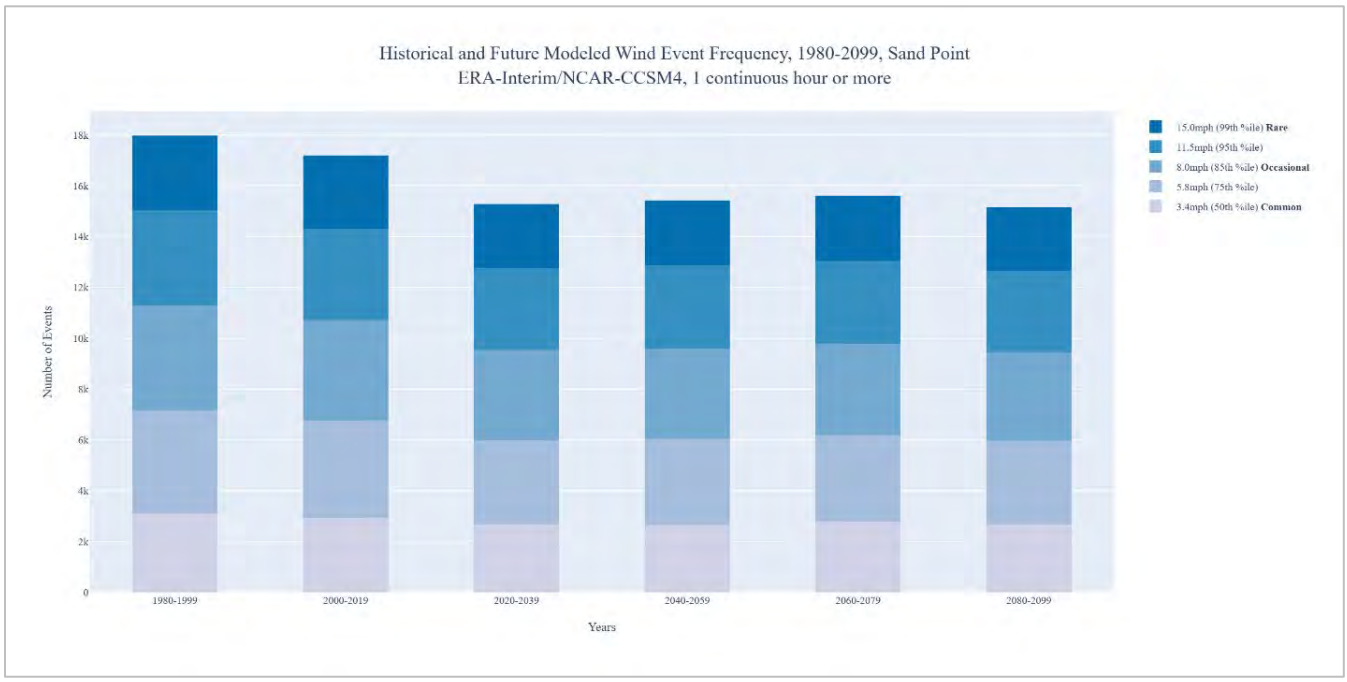
Figure M-24 shows a similar trend for average monthly precipitation in Sand Point (UAF/SNAP 2026).




Source: UAF/SNAP 2026

**Figure M-24- Average Monthly Precipitation for Sand Point, Alaska**

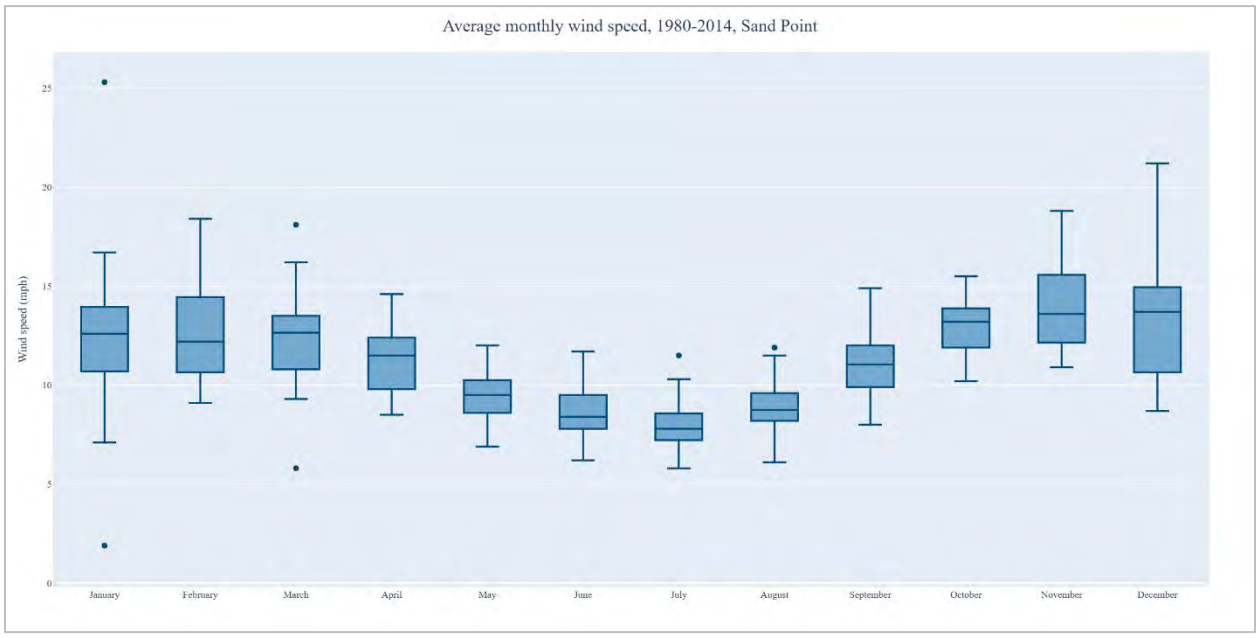
Figure M-25 models historical and future wind event frequency in Sand Point from 1980 through 2099 (UAF/SNAP 2026). This model predicts a relatively similar wind profile in the decades to come.




Source: UAF/SNAP 2026

**Figure M-25- Historic and Future Wind Event Frequency, 1980-2099, Sand Point**

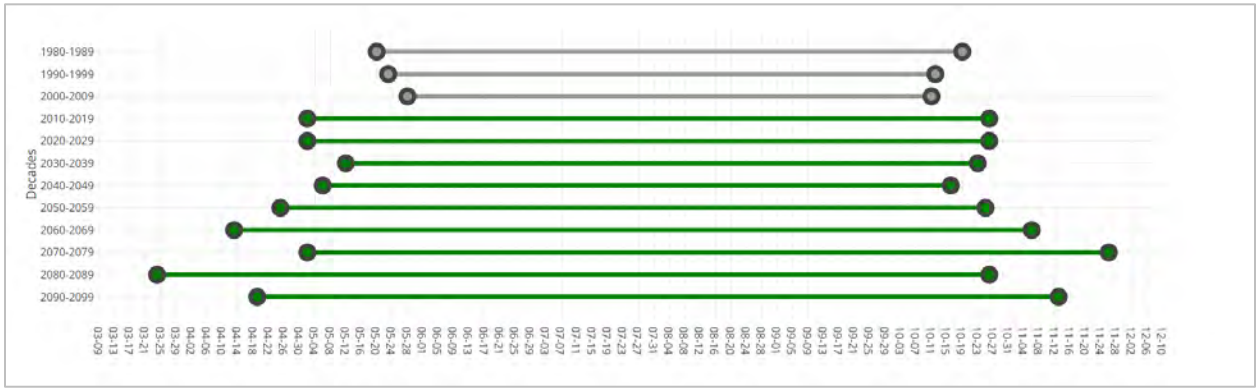
Figure M-26 shows average monthly wind speeds from 1980 to 2014 in Sand Point (UAF/SNAP 2026). This data confirms higher wind speeds in the winter months.




Source: UAF/SNAP 2026

**Figure M-26- Average Monthly Wind Speed, 1980-2014, Sand Point**

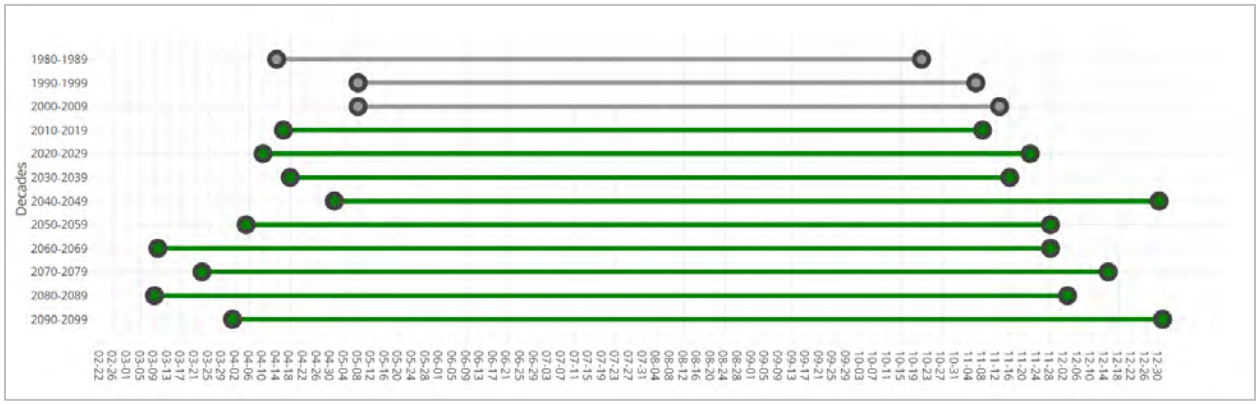
Figure M-27 shows changes in the growing season historically and through 2099 in Unga (UAF/SNAP 2026).




Source: UAF/SNAP 2026

**Figure M-27- Historical and Future Projected Changes in Growing Season in Unga (1980-2099)**

Figure M-28 shows changes in the growing season historically and through 2099 in Sand Point (UAF/SNAP 2026).




Source: UAF/SNAP 2026

**Figure M-28- Historical and Future Projected Changes in Growing Season in Sand Point (1980-2099)**

### M.4.1.10 Tsunami

#### M.4.1.10.1 Location

The entire coastline of Unga Island and Sand Point are at risk of tsunami inundation, including the majority of the critical infrastructure.

Formal tsunami inundation mapping is not available for Unga Village. Therefore, the tsunami hazard area shown in Figure M-29 was estimated by applying a 0.5-mile buffer around shoreline, consistent with the coastal flooding hazard methodology used in the 2023 State of Alaska Hazard Mitigation Plan Update. ***This estimated hazard area is intended for planning purposes only and does not represent actual or modeled tsunami inundation extent, wave characteristics, or depth of inundation.***

Formal inundation mapping for Sand Point was completed in 2017.

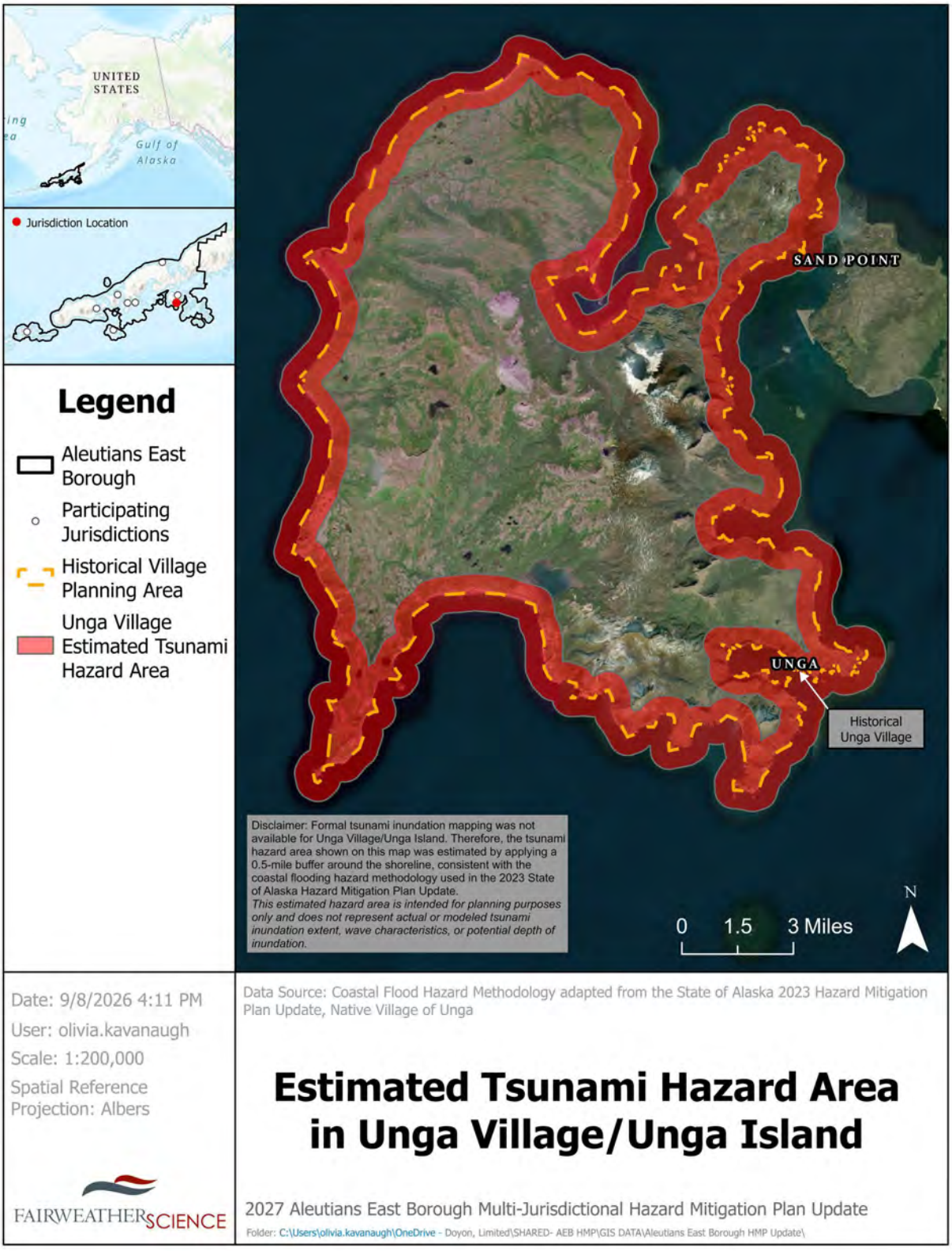



**Figure M-29 - Estimated Tsunami Hazard Area- Unga Village/Unga Island**

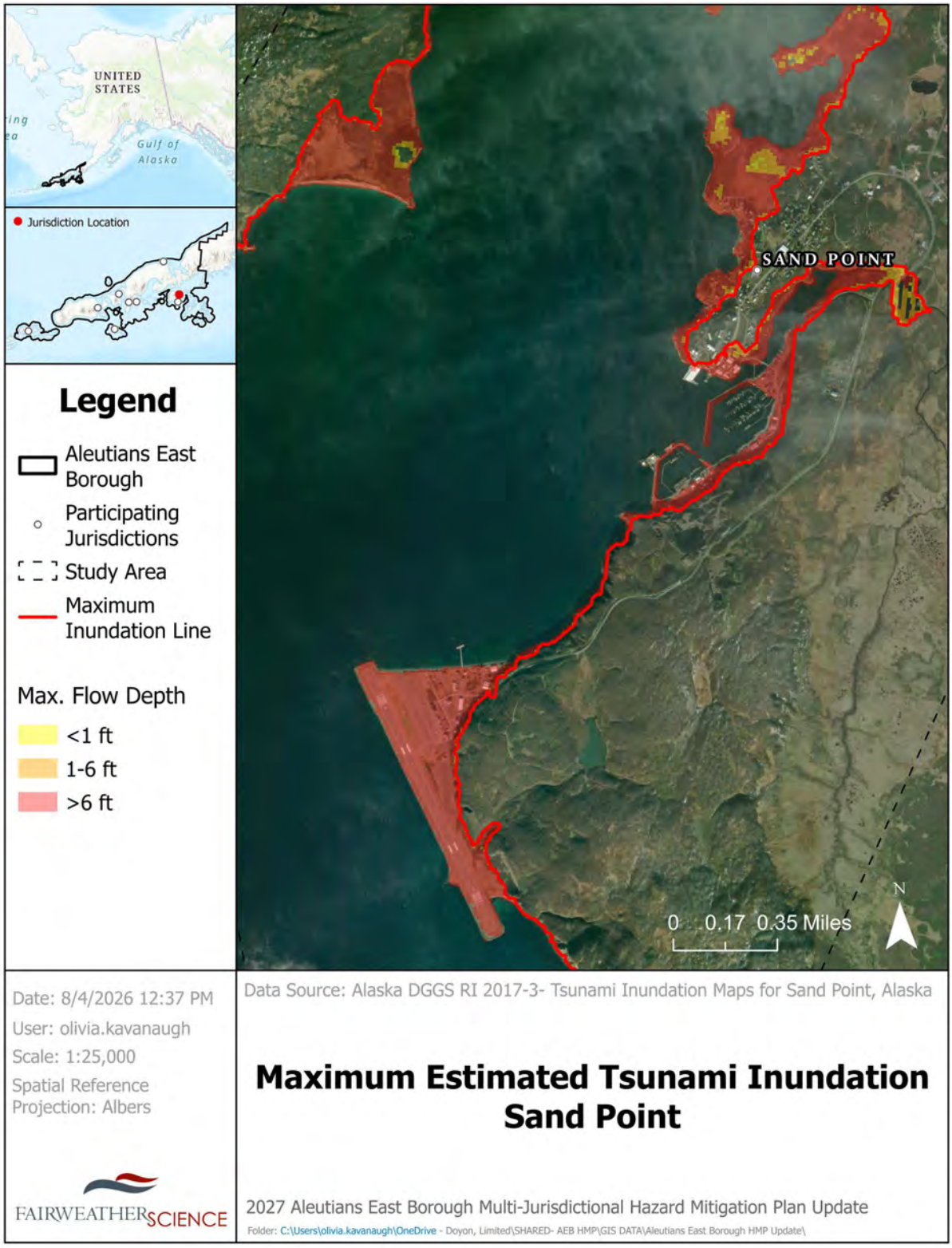



**Figure M-30 - Maximum Estimated Tsunami Inundation of Sand Point**

### M.4.1.10.2 History

Unga Village is located near historic tsunami events, due to its vast coastline and proximity to the Alaska-Aleutian Megathrust. See Table 17 for a comprehensive list from the NOAA National Centers for Environmental Information (NCEI) detailing the earthquake-generated tsunamis with observed or measured waves throughout the Planning Area.

Both Sand Point and Unga Island have a history of tsunami runup events.

**1788 Earthquakes and Tsunamis**

According to records kept by Russian explorers and written testimonies cited later by Russian Bishop Ivan Veniaminov, during the summer of 1788, the Aleutian Islands saw two massive, tsunami-producing megathrust earthquakes (estimated at magnitudes of 8.0 to 8.9).

According to the most reliable documentation, the first tsunami occurred on July 21, coinciding with a major earthquake of magnitude 8 or greater, and the second one 16 days later, on August 6. The second tsunami was the highest, reaching maximum runup heights between 50 m and 90 m, and even over 100 m, on Unga Island and Sanak Islands, according to various accounts (Ferrer and Gonzalex-de-Vallejo 2024). There is no direct evidence of these maximum heights, as the data comes from oral references transcribed and translated from original Russian descriptions.

Repeated tsunamis were characteristic of the 1788 earthquakes, indicating an offshore location for these shocks. The people ran inland when the sea withdrew from the shore. Even so, not everyone survived. Writing in 1840, Bishop Veniaminov cited stories about how the flood at Sanak Island "*preceded as strong and infrequent walls*."

Bishop Veniaminov also cited a report stating, "*on 11 July 1788...on Unga [Island] there was such a strong earthquake that it was difficult to stand up, many landslides fell, and after a time a terrible flood occurred*" (UAF Geophysical Institute 1980).

The 1788 accounts are significant not only as historical records of tsunami occurrence, but also because they preserve Aleut knowledge and memory of catastrophic coastal inundation. The oral tradition and early written record together demonstrate how tsunami experience has been transmitted across generations, providing locally grounded hazard information from a period that predates instrumental monitoring. The historical descriptions and estimated runup values should be interpreted with appropriate uncertainty and retained according to their original source and context.

**April 1946 Aleutian Islands Earthquake and Tsunami**

The 1946 Aleutian Islands earthquake and tsunami struck on April 1, 1946, triggered by a powerful magnitude 8.6 undersea earthquake in the Aleutian Trench off Unimak Island, Alaska, which sent devastating Pacific-wide waves that resulted in a handful of deaths in Alaska and 159 deaths in Hilo, Hawaii.

The tsunami completely obliterated the steel-reinforced concrete Scotch Cap Lighthouse on Unimak Island (in the Aleutians East Borough) and killed all five Coast Guard keepers (National Coast Guard Museum 2024). Run-up heights locally reached up to 138 feet (42 meters).



Source: National Coast Guard Museum 2024

**Figure M-31- Scotch Cap Lighthouse: Before and After the 1946 Tsunami**

Since 1788, there have been 4 documented tsunami runup events on Unga Island.

**Table M-3 - Historic Tsunami Runups on Unga Island (1788 – August 1,2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 3 | 1788-7-21 | UNGA ISLAND, AK | EQ | 8 | 98.43 |
| 4 | 1788-8-6 | UNGA ISLAND, AK | EQ | 8 | 288.71 |
| 10 | 1868-5-15 | UNGA ISLAND, AK | EQ | Unknown | 20.01 |
| 18 | 1946-04-01 | UNGA ISLAND, AK | EQ & LS | 8.6 | 2.62 |

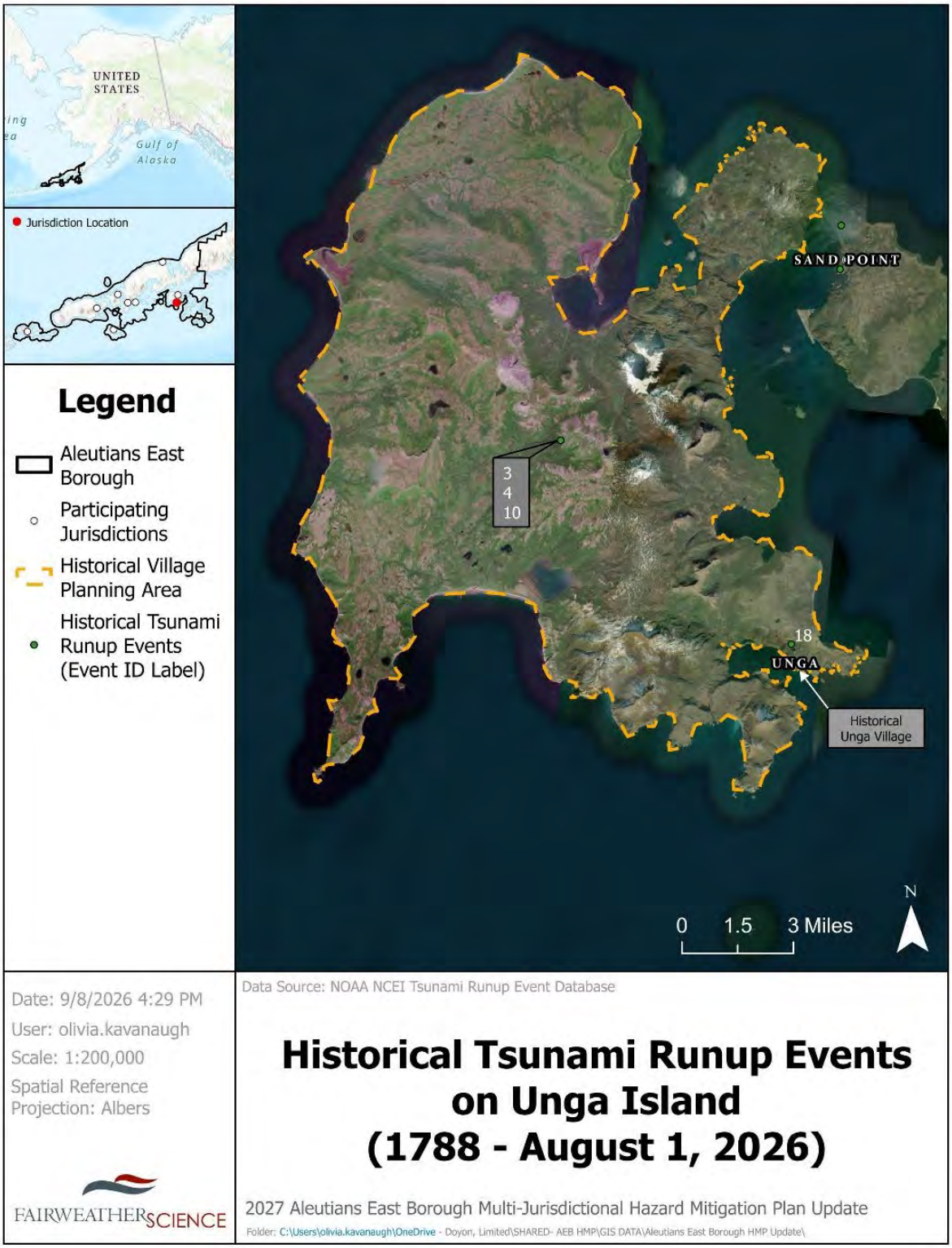



**Figure M-32- Historical Tsunami Runup Events on Unga Island (1788 – August 1, 2026)**

Since 1788, there have been 28 documented tsunami runup events in Sand Point (Table M-4 and Figure M-33). The most recent runup event in Sand Point was recorded in July 2025.

**Table M-4 - Historical Tsunami Runups- Sanak Island (1788 - August 1, 2026)**

| Event ID | Date | Location | Tsunami Cause | Earthquake Moment Magnitude (MW) | Maximum Wave Height (ft) |
|---|---|---|---|---|---|
| 17 | 1946-04-01 | SAND POINT, AK | EQ + LS | 8.6 | Unknown |
| 50 | 1985-03-03 | SAND POINT, AK | EQ | 8 | 0.26 |
| 51 | 1986-05-07 | SAND POINT, AK | EQ | 8 | 0.16 |
| 52 | 1989-09-04 | SAND POINT, AK | EQ | 7.1 | 0.33 |
| 53 | 1995-07-30 | SAND POINT, AK | EQ | 8 | 0.36 |
| 54 | 1996-06-10 | SAND POINT, AK | EQ | 7.9 | 0.16 |
| 55 | 2001-06-23 | SAND POINT, AK | EQ | 8.4 | 0.39 |
| 56 | 2003-11-17 | SAND POINT, AK | EQ | 7.8 | 0.13 |
| 57 | 2004-12-26 | SAND POINT, AK | EQ | 9.1 | 0.46 |
| 59 | 2006-05-03 | SAND POINT, AK | EQ | 8 | 0.16 |
| 60 | 2006-11-15 | SAND POINT, AK | EQ | 8.3 | 0.36 |
| 62 | 2007-08-15 | SAND POINT, AK | EQ | 8 | 0.13 |
| 65 | 2010-02-27 | SAND POINT, AK | EQ | 8.8 | 1.25 |
| 67 | 2011-03-11 | SAND POINT, AK | EQ | 9.1 | 2.00 |
| 71 | 2012-10-28 | SAND POINT, AK | EQ | 7.7 | 0.20 |
| 72 | 2013-02-06 | SAND POINT, AK | EQ | 7.9 | 0.36 |
| 74 | 2014-04-01 | SAND POINT, AK | EQ | 8.2 | 0.30 |
| 76 | 2015-09-16 | SAND POINT, AK | EQ | 8.3 | 0.62 |
| 79 | 2020-07-22 | SAND POINT, AK | EQ | 7.8 | 0.79 |
| 80 | 2020-10-19 | SAND POINT, AK | EQ | 7.6 | 2.30 |
| 82 | 2021-03-04 | SAND POINT, AK | EQ | 8.1 | 0.52 |
| 83 | 2021-07-29 | SAND POINT, AK | EQ | 8.2 | 1.35 |
| 85 | 2021-07-29 | RANGE ISLAND, SAND POINT, AK | EQ | 8.2 | Unknown |
| 87 | 2021-08-12 | SAND POINT, AK | EQ | 8.1 | 0.20 |
| 89 | 2022-01-15 | SAND POINT, AK | VO | N/A | 1.12 |
| 91 | 2023-07-16 | SAND POINT, AK | EQ | 7.2 | 0.49 |
| 92 | 2025-07-16 | SAND POINT, AK | EQ | 7.3 | 0.33 |
| 94 | 2025-07-29 | SAND POINT, AK | EQ | 8.8 | 0.79 |

Tsunami Cause: EQ= Earthquake; LS= Landslide, VO= Volcano
Source: NCEI 2026

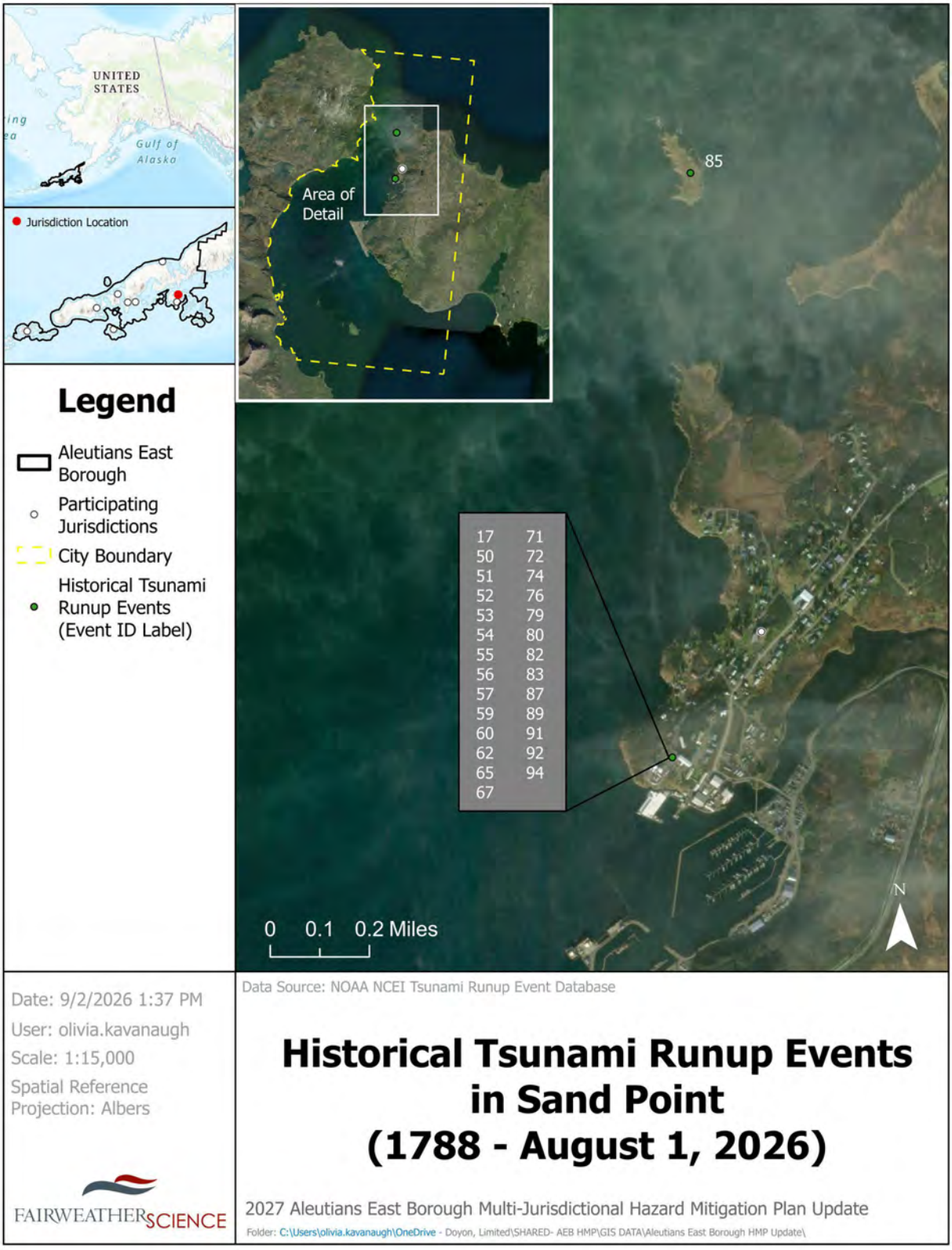



**Figure M-33- Historical Tsunami Runup Events in Sand Point (1788 – August 1, 2026)**

### M.4.1.10.3 Extent (Magnitude and Severity)

Unga Island has experienced tsunami run up events from less than 3 feet to nearly 300 feet.

Sand Point has experienced tsunami run up events from less than 1 foot to 2 feet.

Based on the extent of past tsunami events and the criteria identified in Table 5 in the Base Plan, the extent of tsunami on Unga Island is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

Based on the extent of past tsunami events and the criteria identified in Table 5 in the Base Plan, the extent of tsunami in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

### M.4.1.10.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | There have been documented tsunami runups up to 2 feet in Sand Point, and up to 300 feet on Unga Island. Future tsunami runups could potentially match or exceed these heights, having significant impact on the shoreline. |
| Infrastructure | There are no recorded impacts from tsunamis in Sand Point. Water damage in coastal lying infrastructure is possible during a tsunami, as is damage to boat harbors, roadways, and airport runways. Critical facilities at risk of tsunami inundation include the Salmon Hatchery, Aquaculture Building, Church, Saint Nicholas Church, Storage Building, Volunteer Fire Department Building, Fire Boat, FAA Building, ARFF / SREB Building, Robert E. Galovin Small Boat Harbor, Harbor House, Sand Point Boat Storage, Trident Seafood Dock, SDP 150 Ton Travel Lift, Sand Point Harbor, Large Boat Dock, Harbor Dock, Cargo Storage Area, Sand Point Ferry Dock, City Dock, Sand Point DOT, Reeve Air Building, Aviation Terminal, Airport Runway, Small Airplane Storage, Water Reservoir, City Pump House, and Humboldt Creek Reservoir Dam. |
| People | There is no record of injuries or fatalities due to tsunamis or in Sand Point. Injuries and death are possible during a tsunami runup due to drowning, being swept into debris, or trapped during inundation. |
| Utilities | There is no record of utility disruptions due to tsunamis in Sand Point. Tsunamis can damage underground water and sewer lines, underwater cables, overhead power lines, and septic systems. |
| Transportation | There are no recorded tsunami related impacts on transportation systems in Sand Point. Future tsunamis could impact road and air travel by damaging or inundation runway surfaces and roadways. Marine travel could also be limited or delayed due to damage to boat harbors, marine vessels, or fueling stations along the coast. |
| Economy | There are no recorded economic impacts due to tsunamis in Sand Point. |
| Subsistence Resources | There are no recorded tsunami related impacts on subsistence resources in Sand Point. |

### M.4.1.10.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Unga Island will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Likely** that Sand Point will experience a tsunami event (warning, evacuation, and/or inundation) in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

### M.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in Unga Village and Sand Point is not anticipated to change in the future. |
| Location | The location of tsunami events in Unga Village and Sand Point is not anticipated to change in the future. All low-lying coastal areas in Sand Point will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in Unga Village and Sand Point. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in Unga Village and Sand Point. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in Unga Village and Sand Point. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in Unga Village and Sand Point, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in Sand Point could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in Unga Village and Sand Point, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in Sand Point, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area. Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in Sand Point or Unga Island. |

### M.4.1.11 Volcano

#### M.4.1.11.1 Location

While there are no reports of volcanic eruptions impacting Unga Village, its proximity to Mount Pavlof suggests that the historic village experienced volcanic ashfall impacts comparable to those observed in Sand Point.

According to the 2023 State of Alaska HMP, Unga Village and Sand Point are located in a **moderate** volcanic ash hazard level area.




**Figure M-34 – Unga Village Volcanic Hazard Areas**

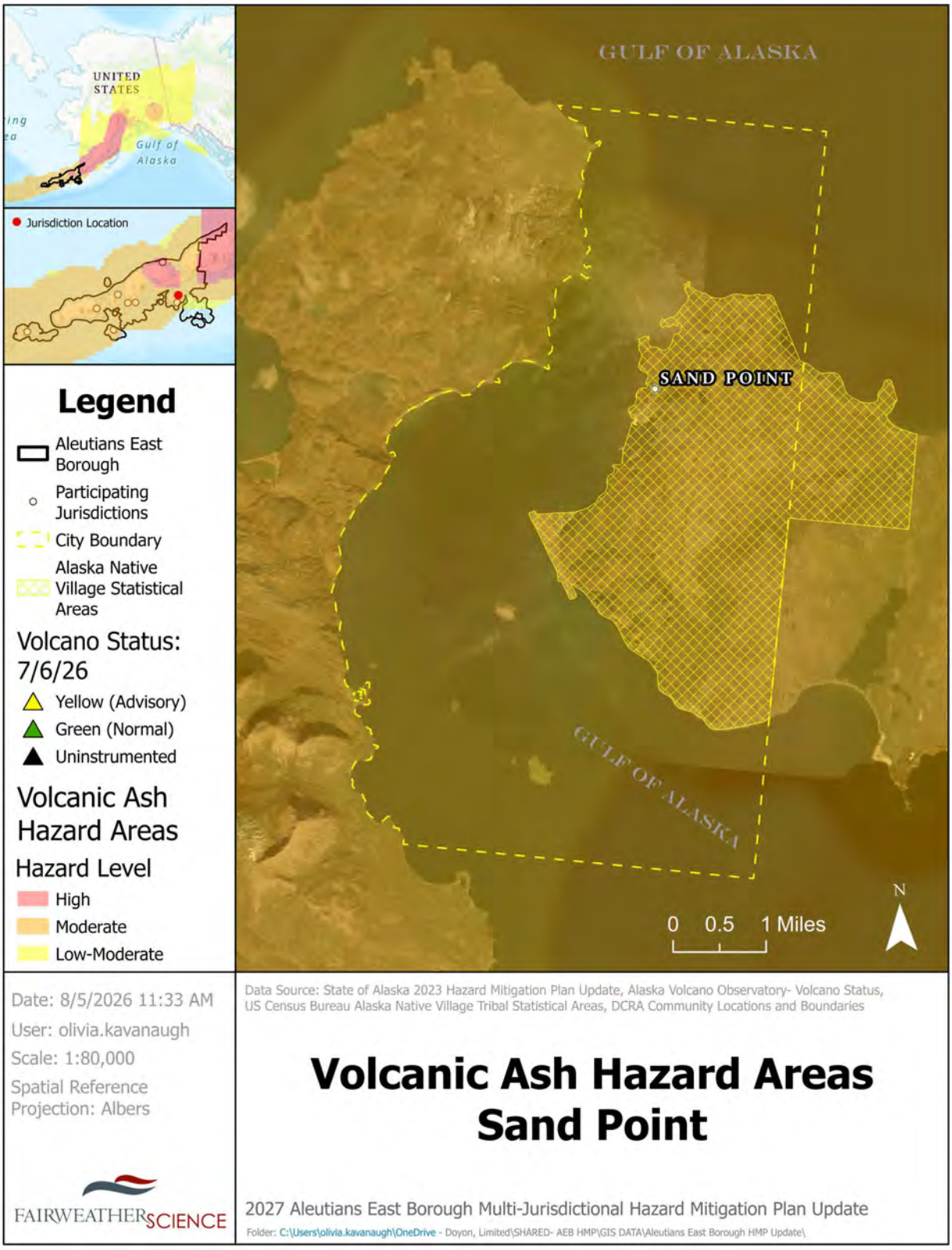



**Figure M-35 – Sand Point Volcanic Hazard Areas**

### M.4.1.11.2 History

Unga Village and Sand Point has had a storied history of volcanic eruptions that have impacted the surrounding communities. Although Unga Island itself does not contain an active volcano, its geology preserves evidence of extensive volcanic activity in the past. The island contains andesitic and dacitic lava flows, volcanic tuffs, and breccias that record episodes of volcanism during its geological development (AKDNR 1970).

The closest active volcano to Sand Point is **Mount Pavlof**, which is approximately 55 miles west of the community. Pavlof has erupted a total of 31 times since 1900, with several of them resulting in localized impacts. The eruptions in 1975, 1996, 2007, 2013, and 2014 resulted in light ash fall accumulating in several AEB communities, including Sand Point.

**Mount Shishaldin** is a historically active volcano that has resulted in several eruptions that has impacted the AEB, including Sand Point. Located approximately 143 miles southwest of Sand Point, Shishaldin has erupted a total of 24 times since 1900. In 2023, it was reported that an eruption from Shishaldin resulted in light ash fall accumulating in Sand Point (AVO 2023).

While data on historical accounts of volcanoes at Unga Village are limited, the area's proximity to several communities in the Planning Area makes it possible that Unga Village have experienced impacts from volcanoes such as Mount Shishaldin and Mount Pavlof.

### M.4.1.11.3 Extent (Magnitude and Severity)

Unga Village and Sand Point is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, Sand Point has been impacted by a volcanic ashfall event on approximately 10 occasions, with the majority resulting in trace to light ashfall in the community.

Based on the extent of past volcano events impacting the geography of Sand Point and the criteria identified in Table 5 in the Base Plan, the historical extent of volcanoes in Unga Village is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

Based on the extent of past volcano events and the criteria identified in Table 5 in the Base Plan, the extent of volcanoes in Sand Point is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

### M.4.1.11.4 Impact

| | Description of Impact |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding Sand Point has been ashfall. While most of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposits (USGS 2015).<br>While volcanoes are identified as a concern in Unga Village, there is limited data of its impact to the geography and land in the area. |
| Infrastructure | The historical ashfall reported in Unga Village or Sand Point has resulted in relatively minor physical damage to community infrastructure. |
| People | While the health risks to residents of Sand Point from a volcanic eruption are always a concern, there are no documented cases of serious injuries or health effects from an eruption in the community.<br>While volcanoes are identified as a concern in Unga Village, there is limited data of its impact to people in the area. |

| | Description of Impact |
|---|---|
| Utilities | There have been no documented cases of volcanic eruptions causing utility disruptions in Sand Point. While wet ash can cause power outages by coating insulators and transformers, the ashfall in the community from past eruptions have only resulted in trace amounts scattered throughout Sand Point (USGS 2015).<br>There are no utilities in Unga Village that can be impacted by volcanic eruptions. |
| Transportation | The primary transportation related impact from a volcanic eruption in Sand Point is aircraft interruptions. Ash clouds from Mount Pavlof's 2013 and 2014 eruptions caused flights from the Sand Point Airport to be cancelled for a total of 1 week (AVO 2014).<br>While volcanoes are identified as a concern in Unga Village, there is limited data of its impact to transportation in the area. |
| Economy | The primary economic related impact from a volcanic eruption in Sand Point is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations.<br>While volcanoes are identified as a concern in Unga Village, there is limited data of its impact to the economy in the area. |
| Subsistence Resources | There have been no recorded cases of a volcanic eruption in Unga Village or Sand Point that has impacted the community's access to subsistence resources. |

#### M.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact Sand Point.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 6 in the Base Plan, it is **Highly Likely** Unga Village will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 6 in the Base Plan, it is **Highly Likely** Sand Point will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### M.4.1.11.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in Unga Village or Sand Point. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in Unga Village or Sand Point. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in Unga Village or Sand Point. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in Unga Village or Sand Point. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in Unga Village or Sand Point. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in Unga Village or Sand Point. |
| Land Use Development | Future climate conditions are not expected to influence land use development in Unga Village or Sand Point. |

| | Description of Future Conditions |
|---|---|
| Subsistence Resources | Future climate conditions are not expected to influence Sand Point's ability to access subsistence resources. |

### M.4.1.12 Wildland Fire

#### M.4.1.12.1 Location

According to LANDFIRE's (Landscape Fire and Resource Management Planning Tools Project) 2025 Alaska Statewide Wildfire Exposure Assessment, the majority of the Unga Village and Sand Point Planning Area is located in an area that is **Minimally Exposed to Wildfire Hazard**. The population center of Sand Point is located in an area that is Infrequently Exposed to Wildfire Hazard (Figure M-36 and Figure M-37).

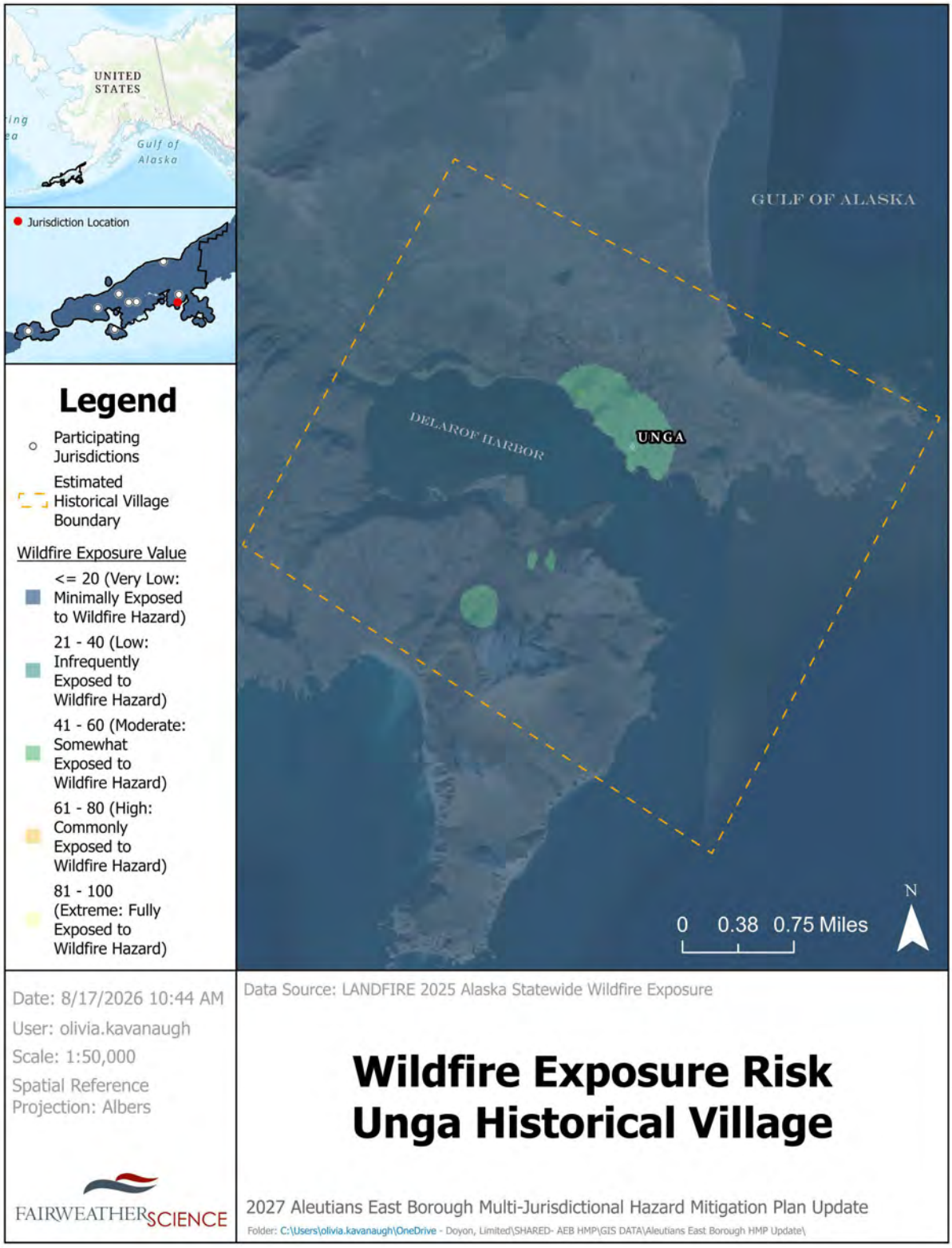



**Figure M-36- Unga Village Wildfire Exposure Risk**

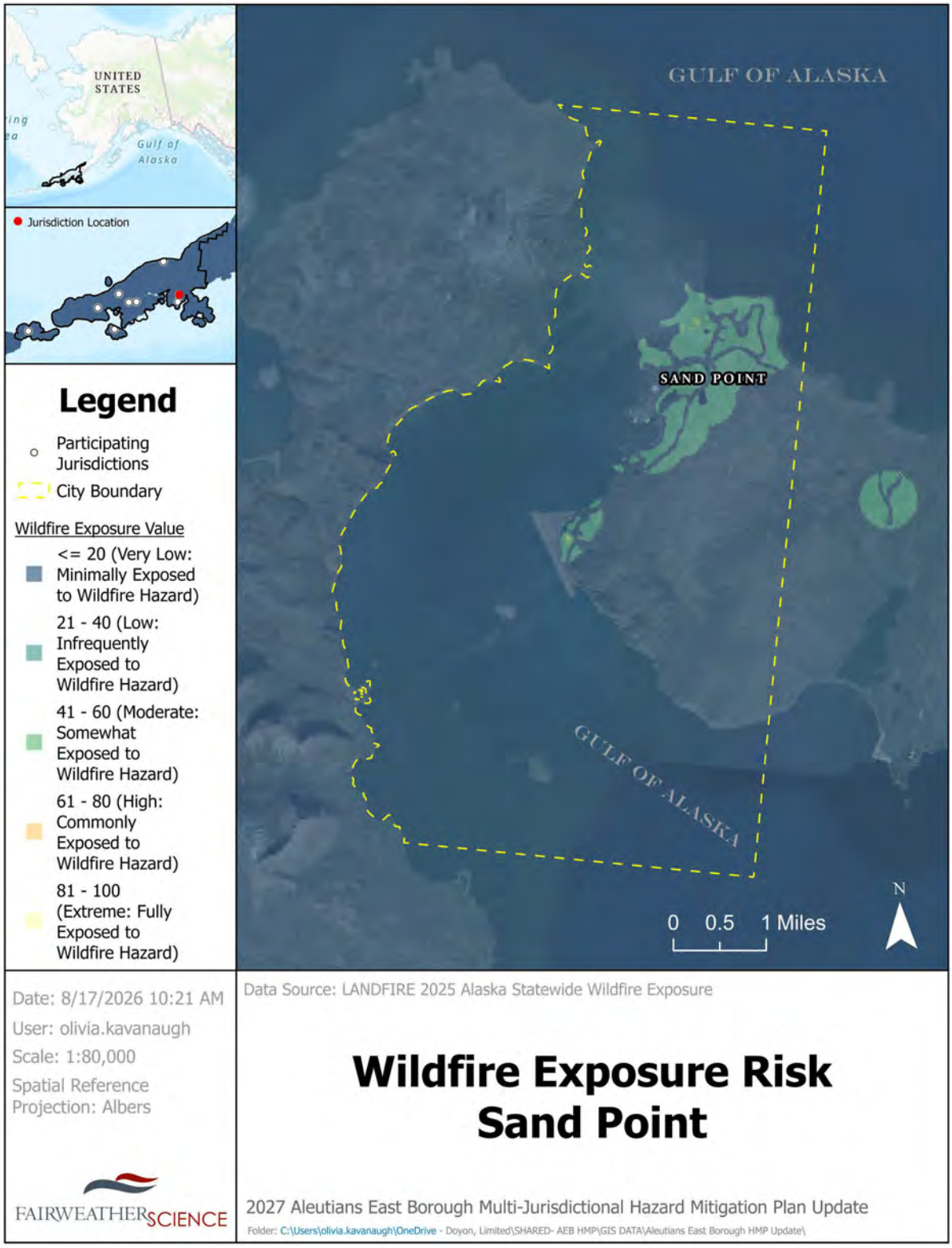



**Figure M-37- Sand Point Wildfire Exposure Risk**

### M.4.1.12.2 History

Table M-5 lists historical fires in and around Unga Island and Sand Point from 1939 to December 2025. None of these fires had a confirmed natural cause due to lightning and were all human-caused or of unknown origin (AICC 2026). Locations of these events are shown in Figure M-38.

**Table M-5- Historical Wildfires near Unga Island and Sand Point (1939 - December 2025)**

| Discovery Date | Name | Prescribed Fire? | Latitude | Longitude | Estimated Total Acres | Cause |
|---|---|---|---|---|---|---|
| 1965-04-18 | Unga Island | No | 55.33333 | -160.55 | 320 | Human- Recreation |
| 1996-05-18 | Popof | No | 55.31667 | -160.5 | 30 | Cooking Fire |
| 2010-05-25 | Sand Point | No | 55.33389 | -160.491 | 3.5 | Human |
| 2019-07-04 | Unga Island | No | 55.2693 | -160.675 | 0.1 | Investigated but cause Undetermined |
| 2022-05-12 | Danger Point | No | 55.34275 | -160.435 | 70.4 | Human- Debris Burning |

Source: AICC 2026

There have been no State or Federal disaster declarations in Unga Village or Sand Point due to wildfires.

The Planning Team reported that when it is dry, fires are easily started.

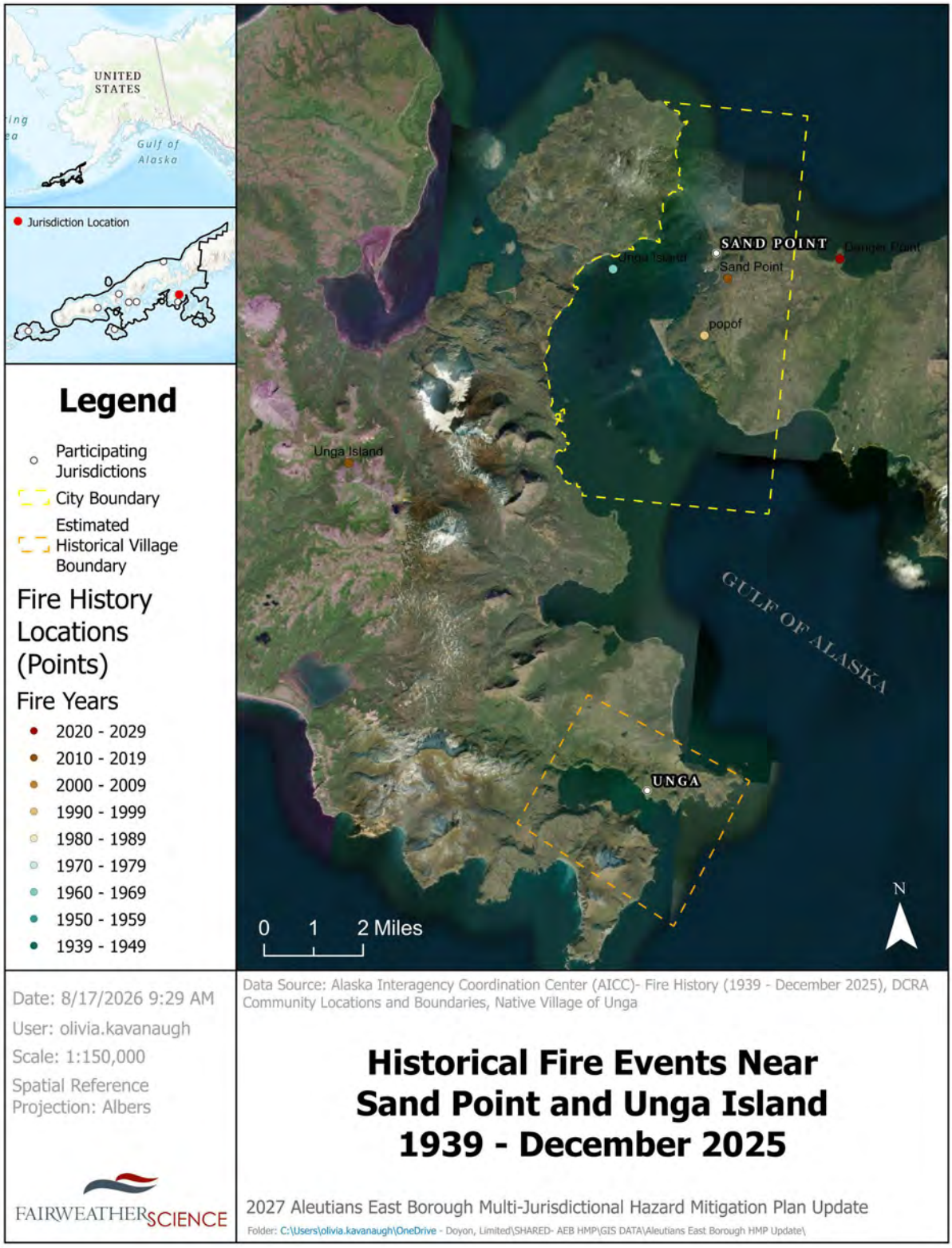



**Figure M-38- Historical Fire Events Near Sand Point and Unga Island**

### M.4.1.12.3 Extent (Magnitude and Severity)

Wildfire can destroy vegetation, negatively impact air quality, and leave land scarring that could increase the risk of landslides, flood, and sediment deterioration/land destabilization.

The largest fire near Unga Village and Sand Point burned 320 acres on Unga Island in April 1965. This fire was due to human recreation. The most recent fire, Danger Point Fire, occurred in May 2022 and burned 70.4 acres east of City of Sand Point limits. This fire was due to human negligence in debris burning.

Based on the extent of past wildfire events and the criteria identified in Table 5 in the Base Plan, the extent of wildfire on Unga Island is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Based on the extent of past wildfire events and the criteria identified in Table 5 in the Base Plan, the extent of wildfire in Sand Point is considered **Limited**, with the potential for injuries and/or illnesses that do not result in permanent disability, a shutdown of critical facilities for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

### M.4.1.12.4 Impact

There are no recorded historical impacts of wildfire on Unga Island or in Sand Point.

In the future, impacts from wildfire could destroy homes, subsistence resources such as berries or other edible plants, and threaten lives.

Wildland fires can cause air transportation impacts including damage to structures that support air travel and fire fighting equipment and personnel. Smoke from wildland and urban fires can disrupt air transportation and in extreme scenarios, fire can damage runway areas making them not suitable for aircraft arrivals and departures.

| | Description of Impact |
|---|---|
| Geography/Land | The Planning Team reported a fire that burned 0.1 acres on Unga Island in 2019. |
| Infrastructure | The Planning Team did not report specific previous wildfire impacts to infrastructure in Unga Village or Sand Point. |
| People | The Planning Team did not report specific previous wildfire impacts to people in Unga Village or Sand Point. |
| Utilities | The Planning Team did not report specific previous wildfire impacts to utilities in Unga Village or Sand Point. |
| Transportation | The Planning Team did not report specific previous wildfire impacts to transportation in Unga Village or Sand Point. |
| Economic | The Planning Team did not report specific previous economic impacts as a result of wildfire in Unga Village or Sand Point. |
| Subsistence Resources | The Planning Team did not report specific previous wildfire impacts to subsistence resources in Unga Village or Sand Point. |

### M.4.1.12.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Unga Island will experience a wildfire event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

Based on previous occurrences and the criteria identified in Table 6 in the Base Plan, it is **Possible** that Sand Point and Unga Island will experience a wildfire event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

### M.4.1.12.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of wildland fires in the Unga Village and Sand Point Planning Area is not anticipated to change in respect to future climate conditions. |
| Location | The location of wildland fires in the Unga Village and Sand Point Planning Area is anticipated to change slightly in respect to future climate conditions, as some areas see a higher likelihood of burning than in the past. Most of these areas are far from communities and infrastructure, with the exception of Sand Point (UAF IARC 2026). |
| Extent (Magnitude and Severity) | Due to future climate conditions, the extent (magnitude and severity) of wildland fires is expected to increase in Alaska in general. Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050 (EPA 2022). In the AEB, more acreage is trending from “less likely to burn” to “more likely to burn” (UAF IARC 2026). |
| Impact | Due to future climate conditions, the impact of wildland fires on the Aleutians East Borough Planning Area may increase. More frequent fires due to a change in future conditions may increase the risk of health hazards and low visibility posed by the increase of smoke (AFSC 2025). |
| Probability of Future Events | Future climate conditions within Alaska are likely to result in increased drought and longer fire seasons. Shifts in vegetation will influence the intensity and frequency of fires (IPCC 2019). A warming climate is also projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018).<br>In Unga, average annual temperatures may increase by about 9 °F by the end of the century, which may contribute to an increase in the frequency of future wildfire events (SNAP 2026).<br>Large wildfires have consumed more boreal forest in Alaska in the last ten years than in any other decade recorded, and the area burned annually is projected to double by 2050, however this is most applicable to Alaska’s most fire-prone regions in the interior (EPA 2022). |
| Population Patterns | Wildland fires due to future climate conditions are not anticipated to impact population patterns in the Unga Village and Sand Point Planning Area. |
| Land Use Development | Wildland fires due to future climate conditions may influence the location of future development in areas with higher fire risk, although in most areas with year-round populations and infrastructure, the wildfire risk is expected to remain low. |
| Subsistence Resources | A warming climate is projected to increase the frequency and size of wildfires, potentially changing the type and extent of wildlife habitat favorable for some important subsistence species (USGCRP 2018). |

## M.4.2 Critical Facilities

**Table M-6- Critical Facilities- Native Village of Unga**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Native Village of Unga-Historical Village/ Unga Island | Community | 0 | Unga Unangaŝ Russian Cemetery | - | 55.184418 | -160.506325 | $1,000,000 | | | | | x | x | | x | x | x | x | x | x | | |
| 2 | Native Village of Unga-Historical Village/ Unga Island | Community | 0 | Unga American Cemetery | - | 55.183344 | -160.506522 | $1,000,000 | | | | | x | x | | x | x | x | x | x | x | | |
| 3 | Native Village of Unga-Historical Village/ Unga Island | Utilities | 0 | Squaw Harbor Dam | - | 55.24395 | -160.55117 | $20,000,000 | | | | | | x | | x | | x | x | x | x | x | |
| 4 | Native Village of Unga-Sand Point | Government | 5 | Unga Tribal Council | 5002 Red Cove Rd | 55.34745 | -160.48368 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 5 | Native Village of Unga-Sand Point | Commercial | 0 | Salmon Hatchery | Airport Rd | 55.341478 | -160.485901 | $1,000,000 | | | | | | x | | x | | x | x | x | x | x | |
| 6 | Native Village of Unga-Sand Point | Commercial | 0 | Aquaculture Building | 3524 Aiport Rd | 55.341394 | -160.486714 | $1,000,000 | | | | | | x | | x | | x | x | x | x | x | |
| 7 | Native Village of Unga-Sand Point | Commercial | 40 | Alaska Commercial Company - Grocery Store | 100 Main St | 55.342159 | -160.496118 | $5,000,000 | | Shumagin Native Corporation | | | | x | | x | | x | | x | x | | |
| 8 | Native Village of Unga-Sand Point | Commercial | 0 | Humboldt Quarry | Airport Rd | 55.327829 | -160.501685 | $20,000,000 | | | | | x | x | | x | | x | | x | x | | |
| 9 | Native Village of Unga-Sand Point | Community | 0 | Swimming Pool | 269 Red Cove Rd | 55.351964 | -160.475965 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 10 | Native Village of Unga-Sand Point | Community | 0 | Baseball Field | Red Cove Rd | 55.350567 | -160.475336 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 11 | Native Village of Unga-Sand Point | Community | 0 | Unites States Postal Service | 9998 Main St | 55.346554 | -160.487202 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 12 | Native Village of Unga-Sand Point | Community | 0 | Cemetery | Pavlof Ave | 55.342559 | -160.496948 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 13 | Native Village of Unga-Sand Point | Community | 0 | E.A.T / Teen Center | 1314 Sand point Ave | 55.339947 | -160.497604 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 14 | Native Village of Unga-Sand Point | Community | 20 | Church | Baptist Church | 55.340778 | -160.499087 | $500,000 | | | | | | x | | x | | x | x | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | Native Village of Unga-Sand Point | Community | 20 | Saint Nicholas Church | Sand Point Ave | 55.336742 | -160.497364 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 16 | Native Village of Unga-Sand Point | Community | 0 | Trident Cemetery | Tolsytoi Ave | 55.336586 | -160.500552 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 17 | Native Village of Unga-Sand Point | Community | 0 | Storage Building | Boat Harbor Rd | 55.334232 | -160.495101 | $50,000 | | | | | | x | | x | | x | x | x | x | | |
| 18 | Native Village of Unga-Sand Point | Education | 1000 | Sand Point School | 269 Red Cove Rd | 55.35171 | -160.475684 | $38,379,381 | | | | | | x | | x | | x | | x | x | | |
| 19 | Native Village of Unga-Sand Point | Education | 50 | Library | 269 Red Cove Rd | 55.351539 | -160.475433 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 20 | Native Village of Unga-Sand Point | Emergency Response | 10 | Volunteer Fire Department | 100 Sand Point Rd | 55.340735 | -160.489419 | $1,000,000 | | | | | | x | | x | | x | x | x | x | x | |
| 21 | Native Village of Unga-Sand Point | Emergency Response | 0 | Fire Boat | Small Boat Harbor | 55.334289 | -160.49923 | $50,000 | | | | | | x | | x | | x | x | x | x | | |
| 22 | Native Village of Unga-Sand Point | Government | 0 | KSDP Radio Station | 5500 Red Cove Rd | 55.349578 | -160.472725 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 23 | Native Village of Unga-Sand Point | Government | 0 | Aleutians East Borough Garage | 4056 Humbolt Ln | 55.344665 | -160.481921 | $50,000 | | | | | | x | | x | | x | | x | x | | |
| 24 | Native Village of Unga-Sand Point | Government | 0 | Aleutians East Borough Office | 349 Humbolt Ln | 55.344317 | -160.481758 | $500,000 | | | | | | x | | x | | x | | x | x | | |
| 25 | Native Village of Unga-Sand Point | Government | 0 | ADF&G Shed | 3000 B Sand Point Ave | 55.345612 | -160.488508 | $50,000 | | | | | | x | | x | | x | | x | x | | |
| 26 | Native Village of Unga-Sand Point | Government | 0 | TelAlaska Tower | 100 Sand Point Ave | 55.342566 | -160.494149 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 27 | Native Village of Unga-Sand Point | Government | 10 | City Hall | 423 Main St | 55.340985 | -160.498091 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 28 | Native Village of Unga-Sand Point | Government | 0 | Sand Point City Public Works | 1000 Airport Rd | 55.335356 | -160.490407 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 29 | Native Village of Unga-Sand Point | Government | 0 | USGS Shumagin Magnetic Observatory | 1000 Airport Rd | 55.335274 | -160.491416 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 30 | Native Village of Unga-Sand Point | Government | 0 | FAA Building | Airport Rd | 55.317117 | -160.519873 | $500,000 | | | | | x | x | | x | | x | x | x | x | | |
| 31 | Native Village of Unga-Sand Point | Government | 0 | ARFF / SREB Building | Airport Rd | 55.316828 | -160.520543 | $500,000 | | | | | x | x | | x | | x | x | x | x | | |
| 32 | Native Village of Unga-Sand Point | Government | 0 | FAA Satelitte Communication Dish | Airport Rd | 55.317117 | -160.519873 | $5,000,000 | | | | | x | x | | x | | x | x | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | Native Village of Unga-Sand Point | Medical | 20 | Sand Point Community Health Center | 172 Red Cove Rd | 55.347559 | -160.485798 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 34 | Native Village of Unga-Sand Point | Transportation | 0 | Robert E. Galovin Small Boat Harbor | | 55.33192077 | -160.500739 | $60,000,000 | | | | | x | x | | x | | x | x | x | x | | |
| 35 | Native Village of Unga-Sand Point | Transportation | 5 | Harbor House | | 55.33517231 | -160.496317 | $50,000 | | | | | | x | | x | | x | x | x | x | | |
| 36 | Native Village of Unga-Sand Point | Transportation | 0 | Sand Point Boat Storage | Boat Harbor Rd | 55.336818 | -160.495245 | $500,000 | | | | | | x | | x | | x | x | x | x | | |
| 37 | Native Village of Unga-Sand Point | Transportation | 0 | Trident Seafood Dock | Chichagof Ave | 55.335219 | -160.501145 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 38 | Native Village of Unga-Sand Point | Transportation | 0 | SDP 150 Ton Travel Lift | Boat Harbor Rd | 55.33481 | -160.496252 | $5,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 39 | Native Village of Unga-Sand Point | Transportation | 0 | Sand Point New Harbor | Boat Harbor Rd | 55.331477 | -160.501896 | $60,000,000 | | | | | x | x | | x | | x | x | x | x | | |
| 40 | Native Village of Unga-Sand Point | Transportation | 0 | Big Boat Dock | Boat Harbor Rd | 55.330773 | -160.501556 | $20,000,000 | | | | | x | x | | x | | x | x | x | x | | |
| 41 | Native Village of Unga-Sand Point | Transportation | 0 | Harbor Dock | Boat Harbor Rd | 55.330069 | -160.502449 | $20,000,000 | | | | | x | x | | x | | x | x | x | x | | |
| 42 | Native Village of Unga-Sand Point | Transportation | 0 | Cargo Storage Area | Boat Harbor Rd | 55.330339 | -160.500958 | $50,000 | | | | | x | x | | x | | x | x | x | x | | |
| 43 | Native Village of Unga-Sand Point | Transportation | 0 | Humboldt Harbor Dock | Boat Harbor Rd | 55.328277 | -160.508622 | $20,000,000 | | | | | x | x | | x | | x | | x | x | | |
| 44 | Native Village of Unga-Sand Point | Transportation | 0 | Sand Point Ferry Dock | Boat Harbor Rd | 55.331166 | -160.505205 | $20,000,000 | | | | x | | x | x | x | | x | x | x | x | | |
| 45 | Native Village of Unga-Sand Point | Transportation | 0 | City Dock | Boat Harbor Rd | 55.331877 | -160.503971 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 46 | Native Village of Unga-Sand Point | Transportation | 0 | Sand Point DOT | 268 Airport Rd | 55.318571 | -160.520728 | $500,000 | | | | | x | x | | x | | x | x | x | x | | |
| 47 | Native Village of Unga-Sand Point | Transportation | 0 | Reeve Air Building | Airport Rd | 55.317597 | -160.519826 | $500,000 | | | | | x | x | | x | | x | x | x | x | | |
| 48 | Native Village of Unga-Sand Point | Transportation | 20 | Aviation Terminal | Airport Rd | 55.317621 | -160.521373 | $1,000,000 | | | | | x | x | | x | | x | x | x | x | | |
| 49 | Native Village of Unga-Sand Point | Transportation | 0 | Airport Runway | Airport Rd | 55.318719 | -160.526886 | $50,000,000 | 5,213 x 150 ft pavement path | | | | x | x | | x | | x | x | x | x | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | Native Village of Unga-Sand Point | Transportation | 0 | Small airplane storage SDP | Airport Rd | 55.316449 | -160.520386 | $5,000,000 | | | | | x | x | | x | | x | x | x | x | | |
| 51 | Native Village of Unga-Sand Point | Transportation | 0 | SDP Heavy Duty Pier | Small Boat Harbor | 55.332938 | -160.49782 | $20,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 52 | Native Village of Unga-Sand Point | Utilities | 0 | Landfill | Landfill Access Rd | 55.331253 | -160.429187 | $1,000,000 | | | | | | x | | | | x | | x | x | | |
| 53 | Native Village of Unga-Sand Point | Utilities | 0 | Water Pump Station 1 | Nagai Ave | 55.349139 | -160.467973 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 54 | Native Village of Unga-Sand Point | Utilities | 0 | Water Pump Station 2 | Nagai Ave | 55.350709 | -160.471488 | $1,000,000 | | | | | | x | | x | | x | | x | x | | |
| 55 | Native Village of Unga-Sand Point | Utilities | 0 | City Water Tank | Red Cove Rd | 55.352531 | -160.475049 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 56 | Native Village of Unga-Sand Point | Utilities | 0 | Sewage Treatment Plant | Kelly Ave | 55.355667 | -160.486484 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 57 | Native Village of Unga-Sand Point | Utilities | 0 | Water Reservoir | Airport Rd | 55.340452 | -160.483747 | $5,000,000 | | | | | | x | | x | | x | x | x | x | | |
| 58 | Native Village of Unga-Sand Point | Utilities | 0 | City Pump House | Airport Rd | 55.341579 | -160.48573 | $500,000 | | | | | | x | | x | | x | x | x | x | x | |
| 59 | Native Village of Unga-Sand Point | Utilities | 0 | TDX Wind Farm | 3004 Sand Point Ave | 55.343635 | -160.489 | $20,000,000 | | | | | | x | | x | | x | | x | x | | |
| 60 | Native Village of Unga-Sand Point | Utilities | 0 | Water Tank 1 | 3010 Sand Point Ave | 55.343239 | -160.490003 | $5,000,000 | | | | | | x | | x | | x | | x | x | | |
| 61 | Native Village of Unga-Sand Point | Utilities | 0 | Water Tank 2 | 3016 Sand Point Ave | 55.342519 | -160.490712 | $5,000,000 | | | | | | x | | x | | x | | x | x | x | |
| 62 | Native Village of Unga-Sand Point | Utilities | 0 | GCI Satellite Station | Sand Point ave | 55.342622 | -160.484268 | $20,000,000 | | | | | | x | | x | | x | | x | x | | |
| 63 | Native Village of Unga-Sand Point | Utilities | 0 | Humboldt Creek Reservoir Dam | | 55.34129 | -160.48566 | $20,000,000 | Dam | City of Sand Point | | | | x | | x | | x | x | x | x | x | |
| 64 | Native Village of Unga-Sand Point | Utilities | 0 | New England Fish Co Dam | | 55.31598 | -160.50875 | $20,000,000 | Dam | Shumagin Native Corporation | | | x | x | | x | | x | | x | x | x | |
| **Total Occupants:** | | | **1200** | | | | **Total Estimated Value:** | **$550,179,381** | | | | | | | | | | | | | | | |

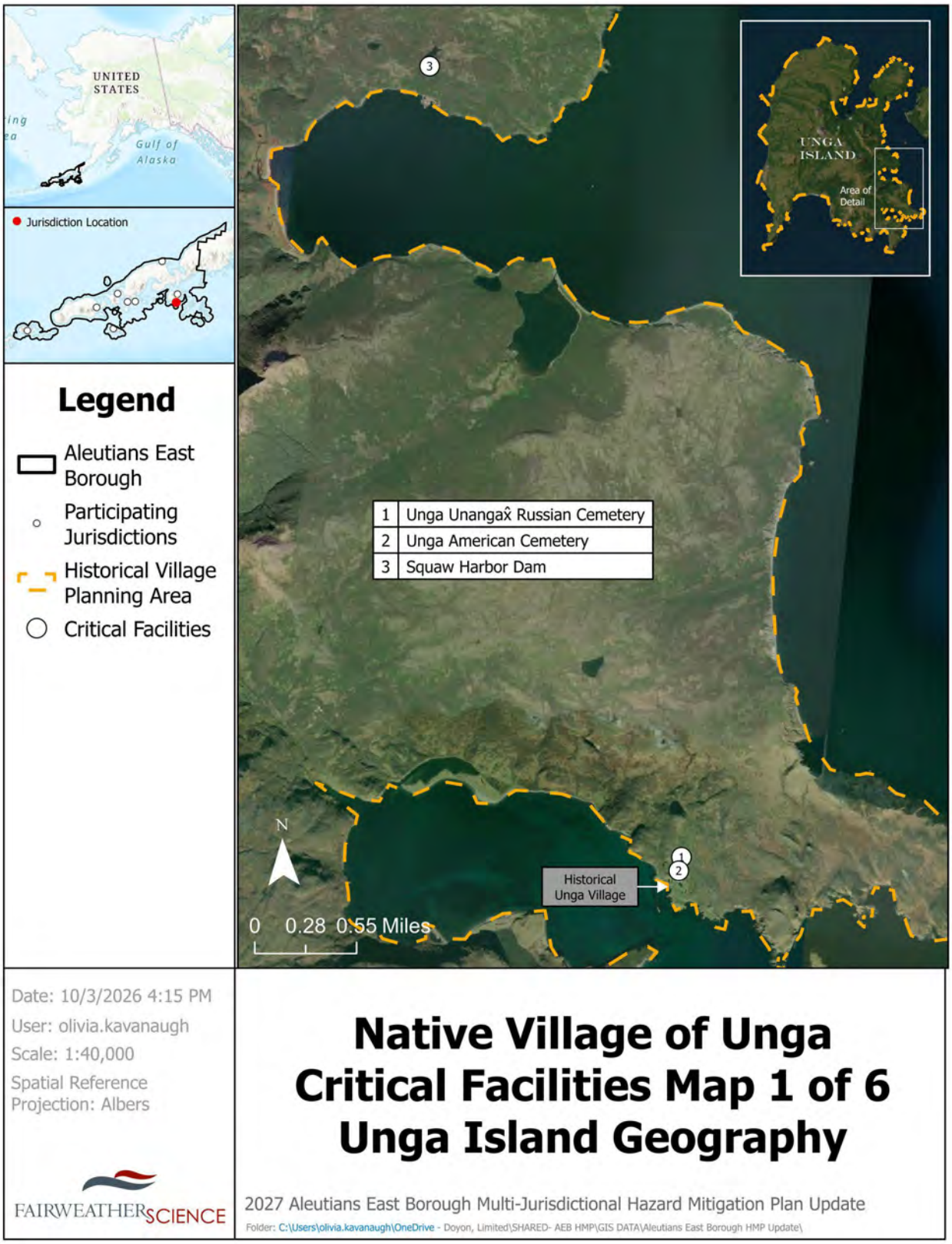



**Figure M-39- Native Village of Unga Critical Facilities Map 1 of 6**

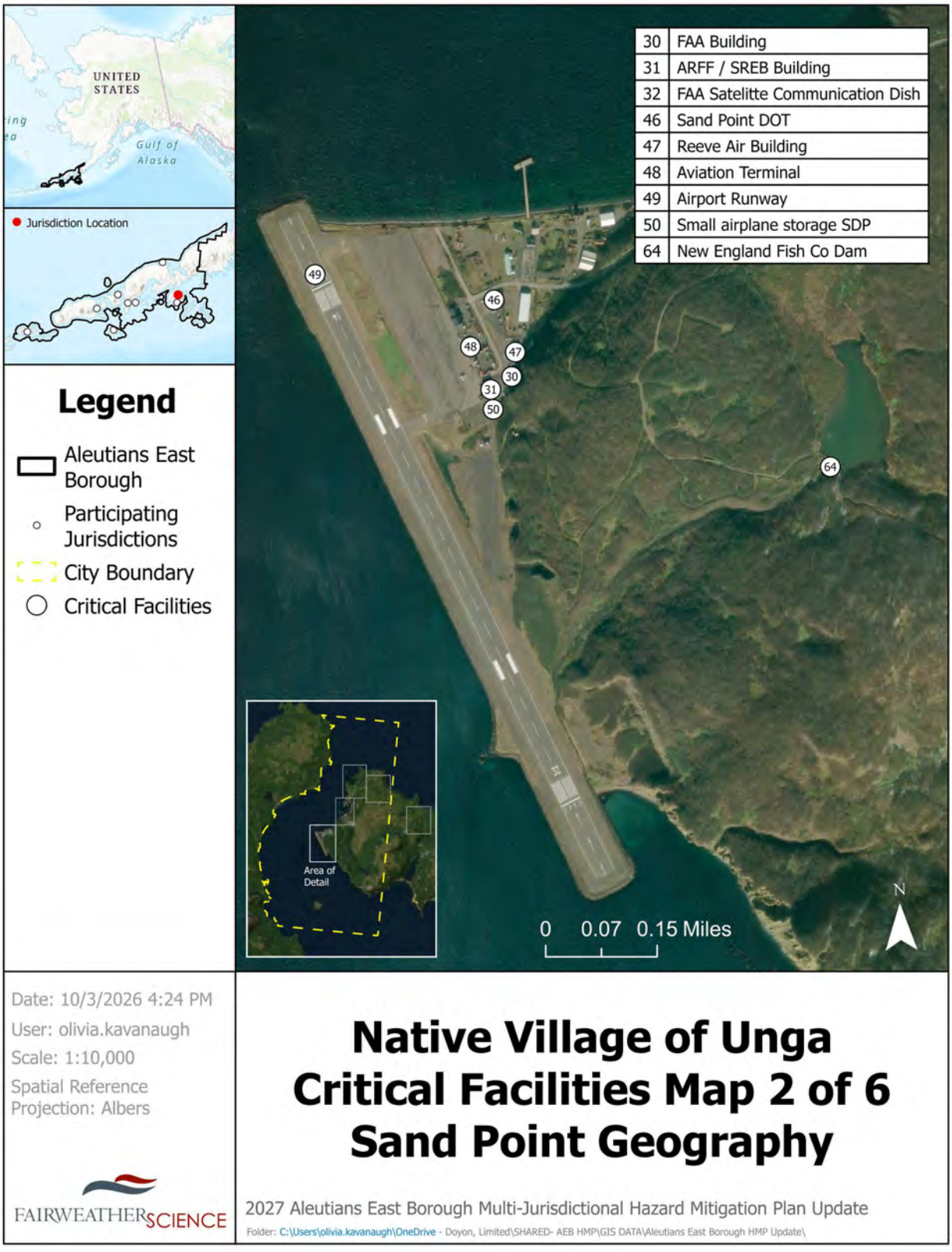



**Figure M-40- Native Village of Unga Critical Facilities Map 2 of 6**

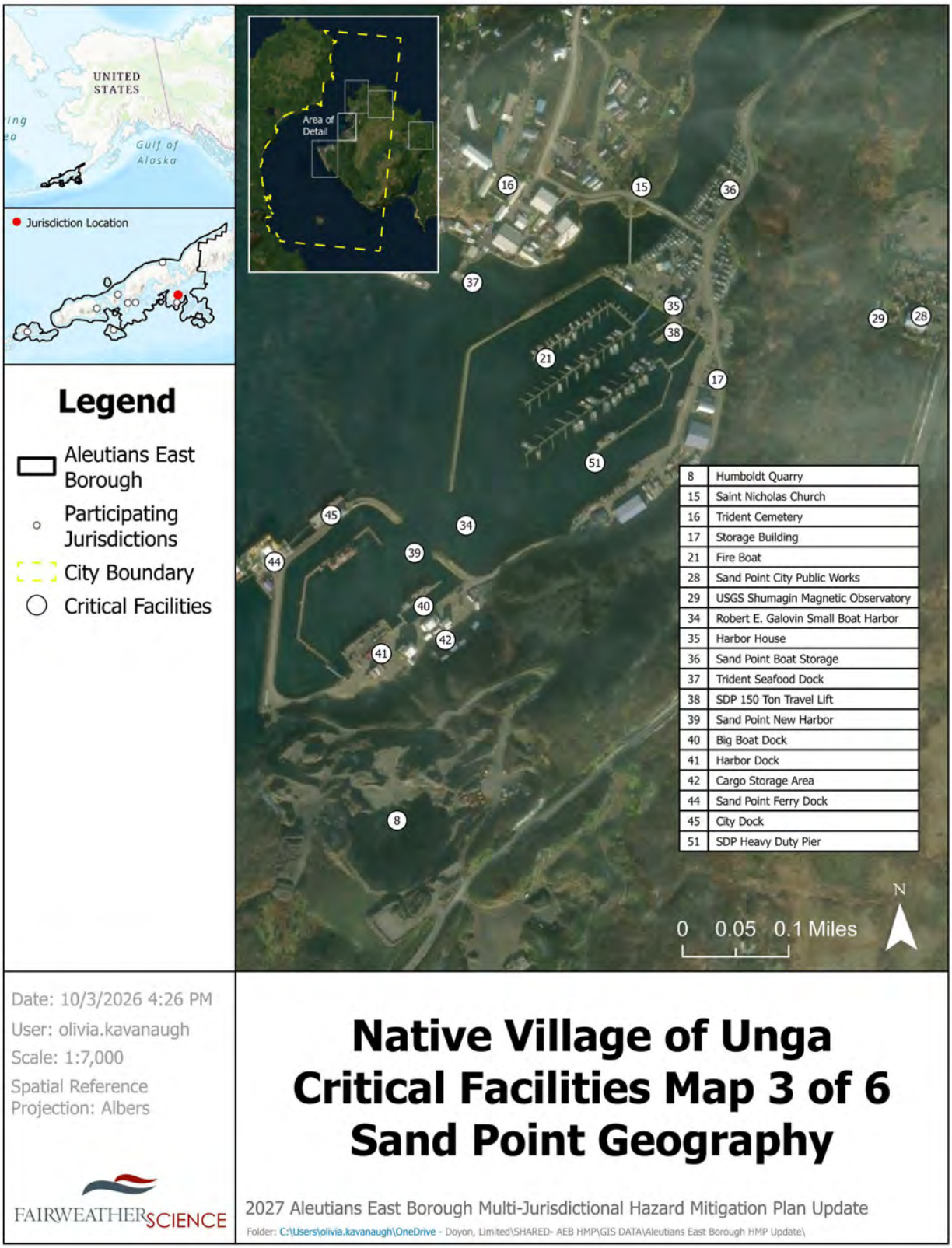



**Figure M-41- Native Village of Unga Critical Facilities Map 3 of 6**

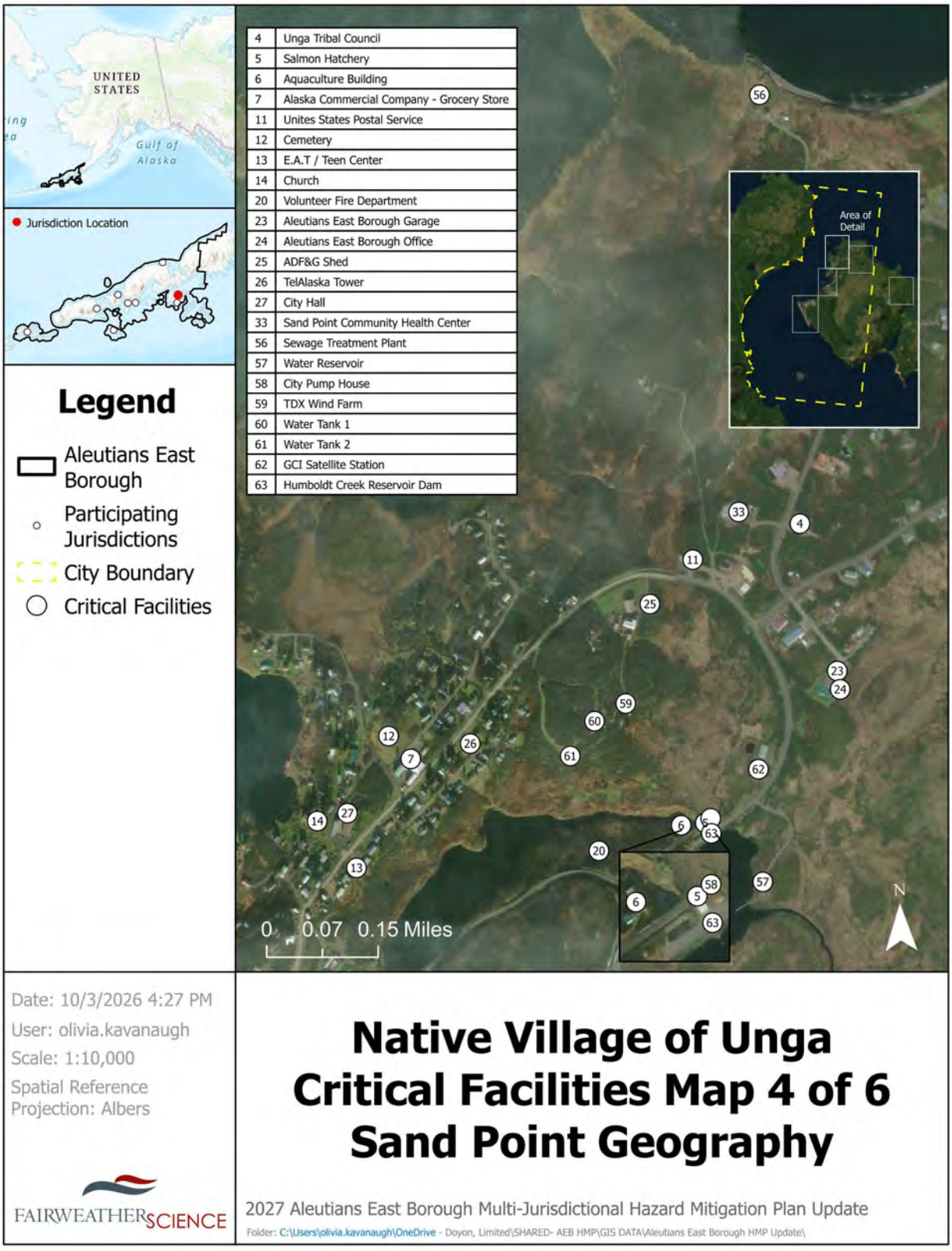



**Figure M-42- Native Village of Unga Critical Facilities Map 4 of 6**

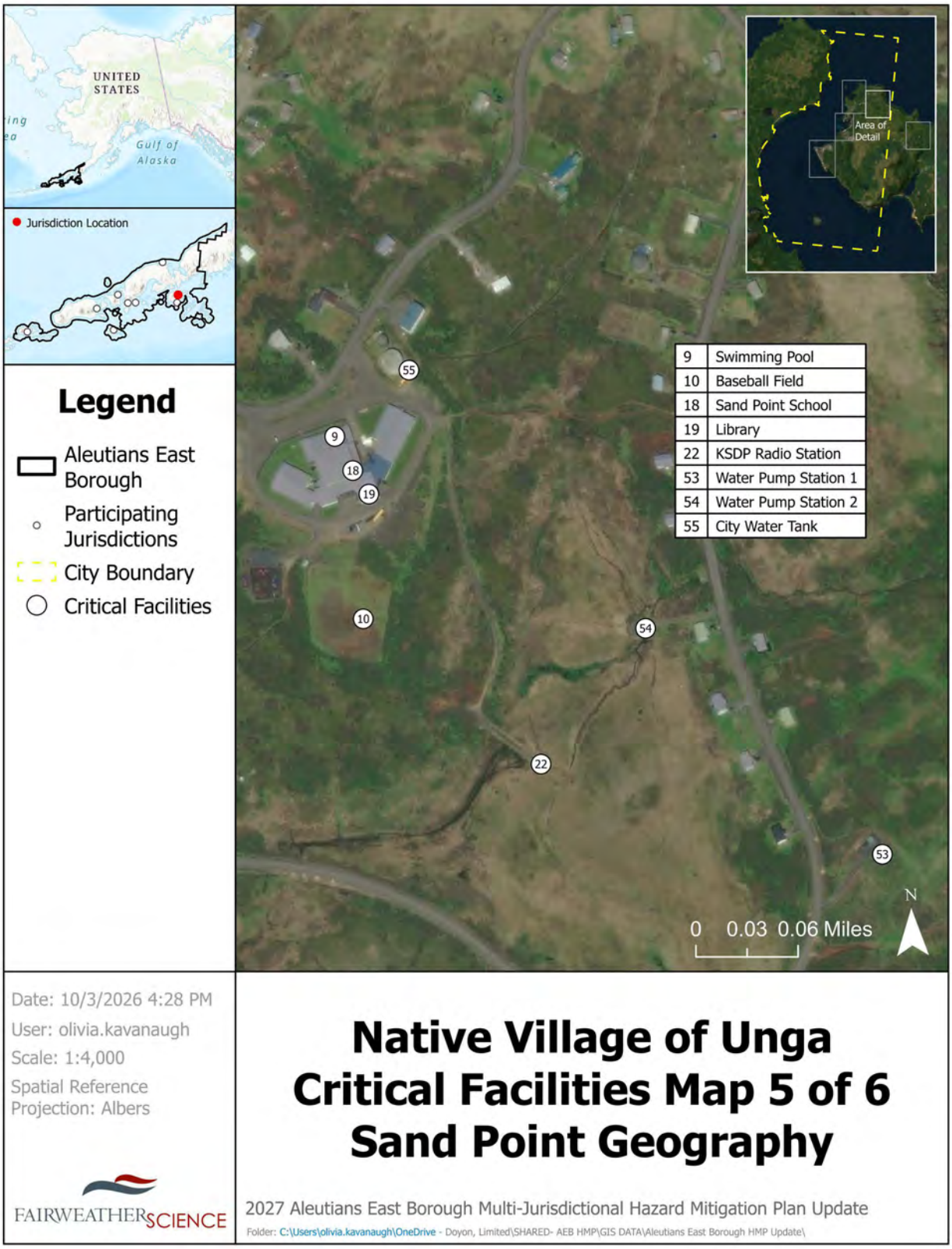



**Figure M-43- Native Village of Unga Critical Facilities Map 5 of 6**

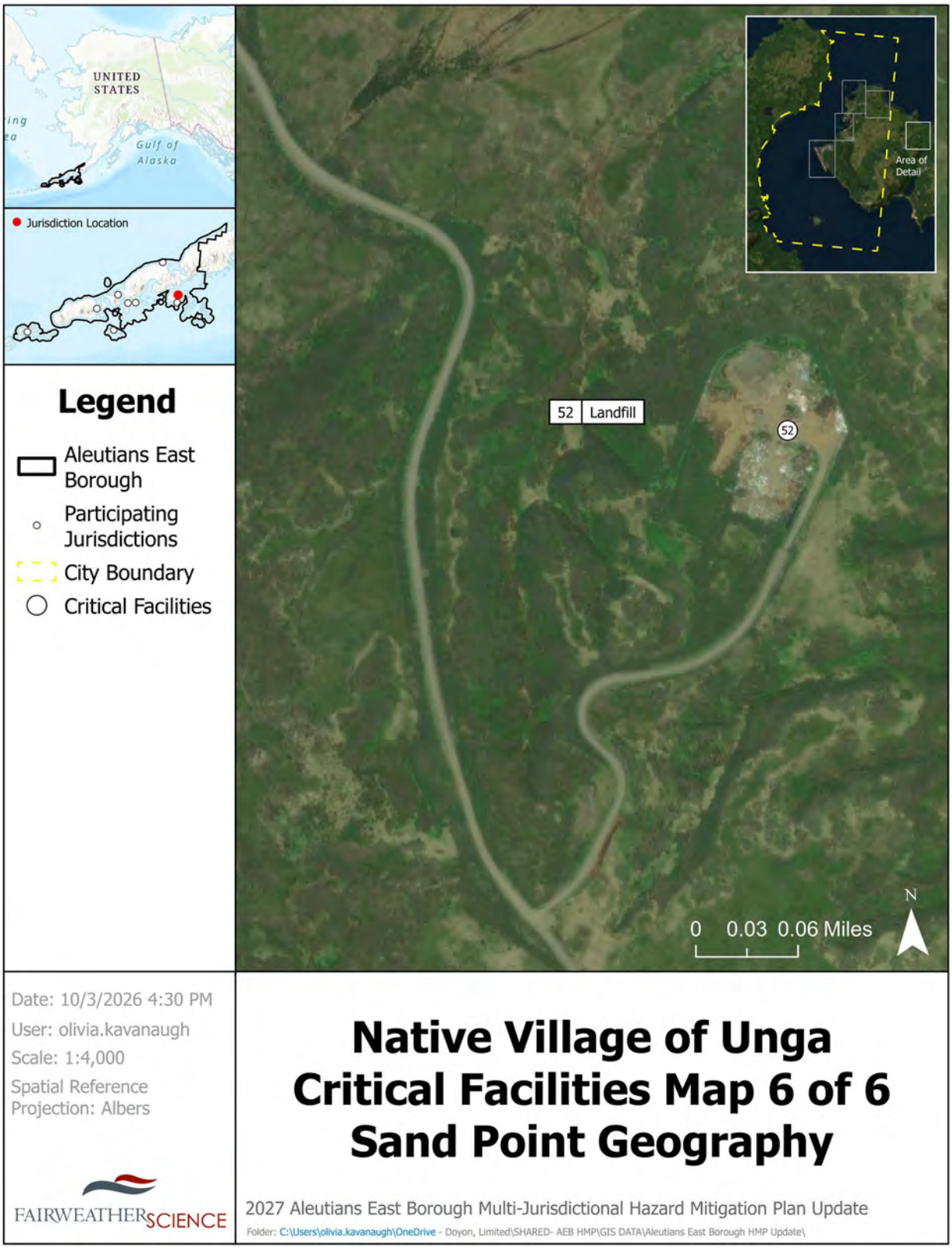



**Figure M-44- Native Village of Unga Critical Facilities Map 6 of 6**

## M.4.3 Summary of Vulnerability

**Table M-7- Jurisdictional Summary of Vulnerability- Native Village of Unga- Historical Village/Unga Island**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | 0 | 0 | $0 | N/A | N/A | N/A |
| Cryosphere-Snow Avalanche | 2 | 0 | $2,000,000 | N/A | N/A | N/A |
| Earthquake | 3 | 0 | $22,000,000 | N/A | N/A | N/A |
| Sediment Deterioration and Land Destabilization | 0 | 0 | $0 | N/A | N/A | N/A |
| Flood | 3 | 0 | $22,000,000 | N/A | N/A | N/A |
| Ground Failure/ Landslide | 2 | 0 | $2,000,000 | N/A | N/A | N/A |
| Severe Weather | 3 | 0 | $22,000,000 | N/A | N/A | N/A |
| Tsunami | 3 | 0 | $22,000,000 | N/A | N/A | N/A |
| Volcano | 3 | 0 | $22,000,000 | N/A | N/A | N/A |
| Wildland Fire | 3 | 0 | $22,000,000 | N/A | N/A | N/A |
| Dam Failure | 1 | 0 | $20,000,000 | N/A | N/A | N/A |
| Invasive Species | 0 | 0 | $0 | N/A | N/A | N/A |

The Native Village of Unga's vulnerability extends beyond the permanent population and built facilities represented in the quantitative assessment above. Although Unga is not occupied year-round, Tribal members and descendants continue to maintain cultural, subsistence, family, and traditional relationships with the historic village and surrounding lands and waters. Unga remains a subsistence-use area, and continued access supports fishing, hunting, gathering, and other traditional activities. Hazards that affect access, cultural resources, traditional-use areas, subsistence resources, or transportation to Unga may therefore affect the Tribe even where no permanent residents or occupied facilities are directly exposed.

**Table M-8- Jurisdictional Summary of Vulnerability- Native Village of Unga- Sand Point**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere- Sea Ice | 1 | 0 | $20,000,000 | 0 | 0 | $0 |
| Cryosphere- Snow Avalanche | 16 | 20 | $283,050,000 | 0 | 0 | $0 |
| Earthquake | 61 | 1200 | $528,179,381 | 237 | 948 | $170,395,480 |
| Sediment Deterioration and Land Destabilization | 1 | 0 | $20,000,000 | 4 | 16 | $2,899,552 |
| Flood | 60 | 1200 | $527,179,381 | 236 | 944 | $169,670,592 |
| Ground Failure/ Landslide | Did not profile this hazard | | | | | |
| Severe Weather | 61 | 1200 | $528,179,381 | 237 | 948 | $170,395,480 |
| Tsunami | 30 | 75 | $338,200,000 | 50 | 200 | $35,831,760 |
| Volcano | 61 | 1200 | $528,179,381 | 237 | 948 | $170,395,480 |
| Wildland Fire | 61 | 1200 | $528,179,381 | 237 | 948 | $170,395,480 |
| Dam Failure | 7 | 10 | $48,500,000 | 1 | 4 | $724,888 |
| Invasive Species | 0 | 0 | $0 | 0 | 0 | $0 |

## M.5 Capability Assessment

***Note: the Native Village of Unga does not participate in the National Flood Insurance Program (NFIP).***

| Planning and Regulatory Tools | |
|---|---|
| **Plans** | **Existing?** |
| Comprehensive/ Master Plan | No |
| Capital Improvements Plan | No |
| Economic Development Plan | Yes |
| Emergency Operations Plan or Small Community Emergency Operations Plan | No |
| Transportation Plan | Yes |
| Housing Plan | No |
| Hazard-specific plans or studies | No |
| **Land Use Planning and Ordinances or Practices** | |
| **Ordinance/Practice** | **Existing?** |
| Zoning Ordinance | No |
| Subdivision Ordinance | No |
| Building Codes | No |
| Natural Hazard Specific Ordinance or Practices (Stormwater, Steep Slopes, Wildfire) | No |
| Acquisition of Land for Open Space and Public Recreation Uses | No |
| Maintenance Programs to Reduce Risk, E.G., Tree Trimming, Clearing Drainage Systems | No |
| Other | No |
| **Administrative and Technical** | |
| **Resource** | **Existing?** |
| Tribal Council/ Governing Body | Yes – 5 Member Council |
| Tribal Chief Executive | Yes – Tribal President |
| Mitigation Planning Committee | No |
| Business Committees | No |
| Mutual Aid Agreements | No |
| Code Inspector | No |
| Environmental/Natural Resources Specialist | Yes – IGAP EPA Environmental Coordinator |

| Administrative and Technical | |
|---|---|
| **Resource** | **Existing?** |
| Emergency Manager | No |
| Community Planner | No |
| Housing Specialist | No |
| Engineer | No |
| Historian/ Cultural Advisor | No |
| Financial or Grants Specialist | No |
| Administrative Staff Person | No |
| Other- IGAP Coordinator | No |
| Warning Systems/ Services | No |
| Hazard Data/Information | No |
| Grant Writing | No |
| Geographic Information Systems (GIS) Analysis | No |

| Financial | |
|---|---|
| **Resource** | **Existing?** |
| Capital Improvements Project Funding | No |
| Gaming Revenue, Enterprise Revenues | Yes |
| Fees For Water, Sewer, Gas, or Electric Services | No |
| Fees From Festivals, Campsites, and recreational Areas | No |
| Permits and Other Fees | No |
| Federal Funding (BIA, HUD) | Yes |
| Contract Services | No |

| Education and Outreach | |
|---|---|
| **Program/Organization** | **Existing?** |
| Gatherings, Festivals, Celebrations and/or Meetings | No |
| Natural Disaster or Safety- Related School Programs | No |
| Fire Safety Programs | No |

The Tribe's continuing knowledge and use of Unga Island provide place-based information relevant to hazard identification and vulnerability assessment. Community observations regarding sea ice, earthquakes, shoreline conditions, invasive species, severe weather, and other environmental conditions can complement technical information in a geography where year-round monitoring and formal hazard mapping are limited. Continued Tribal involvement in documenting and interpreting these conditions is therefore an important planning capability.

# M.6 Mitigation Strategy

## M.6.1 Mitigation Goals

The Native Village of Unga has identified its goals related to hazard mitigation as:

1. Reduce potential natural hazard vulnerability, damage, and loss.
2. Protect critical infrastructure and community facilities from natural hazards.
3. Implement actions to protect cultural and subsistence resources from natural hazards.
4. Improve the resilience of transportation infrastructure and emergency access routes.
5. Strengthen emergency communications and warning systems.
6. Implement public outreach/educational actions to increase awareness of hazards and promote overall preparedness.
7. Increased community resilience through hazard planning, public education, emergency preparedness, and climate adaptation.
8. Improve hazard monitoring and data collection through continued shoreline monitoring, GIS mapping, and environmental assessments.
9. Implement actions that protect the lives and property of residents and visitors from natural hazard events.

## M.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

This is the first edition of the Pauloff Harbor Tribe's HMP. As such, they were not a participating jurisdiction in the 2021 AEB HMP.

## M.6.3 2027 Mitigation Action Plan

**Table M-9- 2027 Mitigation Action Plan- Native Village of Unga**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | Cryosphere-Snow Avalanche | Evaluate slope (GSA in Unga Village and other areas) to identify area where avalanche risk exists | L | Tribal Administrator | USGS, HMA, BIA Tribal Resilience, Alaska DGGS | Natural Systems Protection | Unga Russian Cemetery, Unga American Cemetery | 5-10 years | B/C: Identifying avalanche risk reduces future injury and property loss. TF: Technically feasible using slope modeling, field review, and state data. | Existing Plans: Long Range Transportation Plan. Future Plans: Comprehensive Plan; Land Use Plan; Environmental Plan; Capital Improvement Plan |
| **2** | Dam Failure | Procure inspection report for Squaw Harbor Dam to determine if repairs or maintenance are needed to avoid dam failure (Unga Island) | L | Tribal Administrator | FEMA HHPD, USACE, State of Alaska, BIA | Structure and Infrastructure Projects | Squaw Harbor Dam | 3-4 years | B/C: Inspections reduce dam failure risk and costly emergency impacts. TF: Technically feasible using standard dam safety evaluation. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Dam Safety Plan; Emergency Response Plan; Capital Improvement Plan |
| **3** | Dam Failure | Procure inspection report for New England Fish CO Dam and Humboldt Creek Reservoir Dam to determine if any critical facilities or culturally significant sites are at risk of dam failure | L | Tribal Administrator | FEMA HHPD, USACE, State of Alaska, BIA | Structure and Infrastructure Projects | New England Fish CO Dam, Humboldt Creek Reservoir Dam | 3-4 years | B/C: Identifying vulnerabilities reduces downstream risks and repair costs. TF: Technically feasible through formal dam inspection and hydrologic review. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Dam Safety Plan; Emergency Response Plan; Comprehensive Plan; Capital Improvement Plan |
| **4** | Dam Failure | Identify ownership of Squaw Harbor Dam and conduct inspection | H | Tribal Administrator | FEMA HHPD, USACE, State of Alaska, BIA | Structure and Infrastructure Projects | Squaw Harbor Dam | 0-2 years | B/C: Clarifying ownership and condition reduces liability and failure-related damages. TF: Technically feasible using records research and dam inspection protocols. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Dam Safety Plan; Emergency Response Plan; Capital Improvement Plan |
| **5** | Dam Failure | Explore protection of any areas at risk of dam failure that are used for cultural or subsistence activities | H | Tribal Administrator, Tribal Council | FEMA HHPD, BIA | Natural Systems Protection | New England Fish CO Dam, Humboldt Creek Reservoir Dam, Squaw Harbor Dam, Unga Russian Cemetery, Unga American Cemetery | 0-2 years | B/C: Protection reduces losses to culturally important sites and subsistence activities. TF: Technically feasible, phasing of assessment, design, engineering and construction needed. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Dam Safety Plan; Emergency Response Plan; Comprehensive Plan; Cultural Resources Plan |
| **6** | Earthquake | Strengthen critical facilities, recreation sites, subsistence sites, and culturally significant sites on Unga Island to be more seismically resilient. | M | Tribal Administrator, Environmental Coordinator, Tribal President | HMA, HUD, BIA Tribal Resilience, USGS, Denali Commission | Structure and Infrastructure Projects | All Unga Island Critical Infrastructure | 3-4 years | B/C: Strengthening facilities reduces seismic damage and future repair costs. TF: Technically feasible with phased engineering and structural upgrades. | Existing Plans: Economic Development Plan; Long Range Transportation Plan. Future Plans: SCERP/EOP; Capital Improvement Plan; Comprehensive Plan; Emergency Preparedness Plan; Facilities Management Plan |
| **7** | Earthquake, Severe Weather | Support City of Sand Point's efforts to harden the water and sewer systems to be more resilient against seismic and severe weather events | H | Tribal Administrator | HMA, USDA, EPA, BIA, ANTHC | Structure and Infrastructure Projects | Utilities | 3-4 years | B/C: Hardening utilities reduces outage costs and protects essential services. TF: Technically feasible through standard utility engineering and phased improvements. | Existing Plans: Economic Development Plan; Long Range Transportation Plan. Future Plans: SCERP/EOP; Water System/Utility Plan; Capital Improvement Plan; Continuity of Operations Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **8** | Earthquake, Tsunami | Develop and support education and outreach to prepare residents for earthquakes and tsunamis | M | Tribal Administrator | EMPG, HMA, NOAA, USGS, Alaska DHS&EM, APIA | Education and Awareness Programs | Associated Critical Infrastructure | 0-2 years | B/C: Public education reduces casualties and emergency response costs. TF: Technically feasible using existing communication channels and local partners. | Existing Plans: Economic Development Plan; Long Range Transportation Plan. Future Plans: SCERP/EOP; Tsunami/Emergency Evacuation Plan; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **9** | Earthquake, Tsunami | Support efforts to harden transportation infrastructure to include roads and boat harbor to protect against earthquakes and tsunamis. | H | Tribal Administrator | HMA, MARAD, USACE, EDA, FHWA, Alaska DOT | Structure and Infrastructure Projects | Robert E Golovin Small Boat Harbor, Sand Point new harbor, Humboldt Harbor Dock, Harbor Dock, Big Boat Dock | 3-4 years | B/C: Protecting transportation routes reduces economic losses and emergency access disruptions. TF: Feasible using transportation and coastal engineering standards. | Existing Plans: Economic Development Plan; Long Range Transportation Plan. Future Plans: SCERP/EOP; Transportation Plan; Capital Improvement Plan; Port/Harbor Plan; Tsunami/Emergency Evacuation Plan |
| **10** | Earthquake, Tsunami | Public info and data gathering to finds areas susceptible to landslide and public education for mariners who dropped anchor in areas that could be impacted by a seismic event | M | Tribal Administrator | EMPG, USGS, NOAA, APIA | Education and Awareness Programs | Robert E Golovin Small Boat Harbor, Sand Point new harbor, Humboldt Harbor Dock, Harbor Dock, Big Boat Dock | 0-2 years | B/C: Early identification and outreach reduce injury and vessel damage costs. TF: Technically feasible using public education and GIS data collection. | Existing Plans: Economic Development Plan; Long Range Transportation Plan. Future Plans: SCERP/EOP; Comprehensive Plan; Land Use Plan; Public Information/Outreach Plan |
| **11** | Flood | Feasibility study to install rip rap on critical shoreline on Unga Island to mitigate from coastal flooding impacts | L | Environmental Dept | USACE, HMA, NOAA, Denali Commission | Natural Systems Protection | Unga Russian Cemetery, Unga American Cemetery, Squaw Harbor Dam, Unga Tribal Council | 0-2 years | B/C: Evaluating riprap reduces future flood and erosion damage costs. TF: Technically feasible using coastal engineering and site surveys. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Dam Safety Plan; Emergency Response Plan; Emergency Preparedness Plan; Cultural Resources Plan |
| **12** | Invasive Species | Support establishment of marine cargo/vessel inspection station to ensure no new invasive species are introduced to Sand Point | M | Environmental Dept | NOAA, USFWS, State of Alaska, EDA, BIA Tribal Resilience | Structure and Infrastructure Projects | Harbor House, Cargo Storage Area, City Dock, Sand Point Ferry dock, Sand Point Boat Storage, Trident Seafood Dock | 0-2 years | B/C: Prevention reduces long-term ecological and economic impacts. TF: Technically feasible with existing inspection practices and coordination. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Environmental Plan; Natural Resources Plan |
| **13** | Invasive Species | Education on removal techniques and monitoring methods to eradicate orange hawkweed from Unga Island to reduce the proliferation rate in historic lands | H | Environmental Dept | USDA NRCS, USFWS, NOAA, EMPG, University of Alaska | Education and Awareness Programs | Unga Russian Cemetery, Unga American Cemetery, Squaw Harbor Dam | 0-2 years | B/C: Education helps reduce spread and future eradication costs. TF: Technically feasible with simple field techniques and public outreach. Possible university partnership. | Existing Plans: Long Range Transportation Plan. Future Plans: SCERP/EOP; Environmental Plan; Natural Resources Plan; Public Information/Outreach Plan; Port/Harbor Plan |
| **14** | Invasive Species | In coordination with other Sand Point tribes, support the establishment of an invasive slug monitoring event | M | Environmental Dept | University of Alaska, USDA, USFWS, Alaska DEC | Education and Awareness Programs | Associated Critical Infrastructure | 3-4 years | B/C: Monitoring reduces long-term ecological harm and control costs. TF: Technically feasible using shared equipment and community volunteers. | Existing Plans: Economic Development Plan. Future Plans: Environmental Plan; Natural Resources Plan; Public Information/Outreach Plan; SCERP/EOP |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **15** | Landslide | Conduct historical landslide inventory to better understand hazard risk on Unga Island, and where to focus future mitigation actions | M | Unga Tribe | USGS, HMA, Denali Commission, Alaska DGGS | Plans and Regulations | Unga Russian Cemetery, Unga American Cemetery, Squaw Harbor Dam | 5-10 years | B/C: Inventory reduces siting risks and future losses to landslides. TF: Technically feasible with GIS, records review, and field verification. | Existing Plans: Economic Development Plan. Future Plans: Environmental Plan; Natural Resources Plan; Public Information/Outreach Plan; SCERP/EOP |
| **16** | Landslide | Explore USGS or UAF funded project to install landslide monitoring equipment on Unga Island to identify hazard areas | L | Unga Tribe | USGS, UAF/UAA, HMA, BIA Tribal Resilience, Alaska DGGS | Plans and Regulations | Unga Russian Cemetery, Unga American Cemetery, Squaw Harbor | 5-10 years | B/C: Monitoring improves early warning and helps avoid costly damage. TF: Technically feasible with existing monitoring technologies and partner support. | Existing Plans: Economic Development Plan. Future Plans: Comprehensive Plan; Land Use Plan; Environmental Plan; Natural Resources Plan; SCERP/EOP |
| **17** | Sediment Deterioration and Land Destabilization | Identify and implement measures to mitigate erosion at cabin on Unga Island. Explore engineering studies to identify solutions | H | Tribal Administrator | USACE, NOAA Coastal Resilience, HMA, Denali Commission | Plans and Regulations | Unga Island Cabin | 0-2 years | B/C: Erosion mitigation protects the cabin and reduces future repair costs. TF: Technically feasible with coastal engineering and site stabilization methods. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Emergency Response Plan; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **18** | Severe Weather | Educate public about high wind hazards and maintain access to high wind forecasting, especially for mariners | M | Tribal Administrator, Environmental coordinator | Tribe, APIA, NOAA, EMPG | Education and Awareness Programs | All associated infrastructure | 0-2 years | B/C: Public awareness reduces injury, vessel loss, and emergency response costs. TF: Technically feasible using existing communication channels. | Existing Plans: Economic Development Plan. Future Plans: Comprehensive Plan; Coastal Management Plan; Capital Improvement Plan; Environmental Plan |
| **19** | Tsunami | Work with City of Sand Point to ensure tsunami siren is active and maintain testing in Sand Point | H | Tribal Administrator | Tribe, NOAA, FEMA | Structure and Infrastructure Projects | Tsunami Sirens | 0-2 years | B/C: Reliable siren testing reduces life-safety risk during tsunami events. TF: Technically feasible with standard maintenance and testing protocols. | Existing Plans: Economic Development Plan; Long Range Transportation Plan. Future Plans: SCERP/EOP; Tsunami/Emergency Evacuation Plan; Emergency Preparedness Plan; Public Information/Outreach Plan |
| **20** | Tsunami | Identify high grounds on Unga Island to identify tsunami evacuation routes and locations | H | Tribal Administrator | NOAA, HMA, BIA Tribal Resilience, Tribe | Plans and Regulations | Unga Russian Cemetery, Unga American Cemetery | 0-2 years | B/C: Identifying safe routes reduces evacuation time and potential loss of life. TF: Technically feasible using mapping and field verification. | Existing Plans: Economic Development Plan; Long Range Transportation Plan. Future Plans: SCERP/EOP; Tsunami/Emergency Evacuation Plan; Emergency Preparedness Plan; Comprehensive Plan |
| **21** | Tsunami | Explore DGGS inundation mapping at Unga Island to better understand potential inundation areas | H | Tribal Administrator | HMA, Alaska DGGS, NOAA, ANTHC | Plans and Regulations | Unga Russian Cemetery, Unga American Cemetery | 0-2 years | B/C: Inundation mapping reduces future hazard losses by guiding planning and siting. TF: Feasible with state and federal coastal modeling methods. | Existing Plans: Economic Development Plan; Long Range Transportation Plan. Future Plans: SCERP/EOP; Tsunami/Emergency Evacuation Plan; Comprehensive Plan; Land Use Plan |
| **22** | Volcano | Support City of Sand Point's effort to evaluate water treatment plant to ensure that ashfall can't enter the system | H | Tribal Administrator | HMA, EPA, Alaska DEC, USDA, BIA, USGS | Structure and Infrastructure Projects | Water treatment plant | 3-4 years | B/C: Evaluating ashfall risks reduces contamination and emergency water supply costs. TF: Technically feasible with standard engineering review. | Existing Plans: Economic Development Plan; Long Range Transportation Plan. Future Plans: SCERP/EOP; Water System/Utility Plan; Capital Improvement Plan; Continuity of Operations Plan |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **23** | Volcano | Develop home emergency kits that address health and vehicle protection from poor air quality and ashfall. | M | Tribal Administrator and Council | EMPG, USGS, THSGP | Structure and Infrastructure Projects | Fire Boat, Aviation Terminal, Reeve Air Building, Small airplane storage, Sand Point boat storage | 0-2 years | B/C: Kits reduce health impacts and vehicle damage at low cost. TF: Technically feasible using local distribution and outreach methods. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Comprehensive Plan |
| **24** | Volcano | Develop guidance on how to respond to ashfall events | M | Tribal Administrator | EMPG, USGS, THSGP | Education and Awareness Programs | Associated Critical Infrastructure | 0-2 years | B/C: Clear guidance reduces health impacts and emergency response costs. TF: Technically feasible with existing volcanic hazard resources. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Comprehensive Plan |
| **25** | Wildland Fire | Establish campfire protocol and education for Unga Island to mitigate risk of wildland fire | L | Environmental Dept | EMPG, THSGP, USFS, BIA, FEMA | Education and Awareness Programs | All Unga Island Critical Infrastructure | 0-2 years | B/C: Proper campfire practices reduce wildfire risks and suppression costs. TF: Technically feasible through local outreach and signage. | Existing Plans: Economic Development Plan. Future Plans: SCERP/EOP; Emergency Preparedness Plan; Public Information/Outreach Plan; Transportation Plan |

### M.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Identify buildings and facilities that must be able to remain operable during and following an earthquake event. | An alternate project was selected which strengthens these sites to be more seismically resilient, as opposed to only identifying them. |

# M.7 Plan Update

## M.7.1 Changes in Development, including in Hazard-Prone Areas (current and future)

### M.7.1.1 Changes in Development Since 2021

This MJHMP is the first analysis for the Native Village of Unga. It is reported there has been little development in Sand Point between 2021 and 2026, and the City's overall vulnerability to natural hazards has not significantly changed.

### M.7.1.2 Future/Planned Development

The City of Sand Point has no planned or anticipated future development projects within the community.

## M.7.2 Changes in Priorities and Mitigation Efforts

This MJHMP is the first analysis for the Native Village of Unga.

# M.8 Plan Maintenance

## M.8.1 Planning Team MJHMP Maintenance Commitment

The Native Village of Unga is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.7.

The Native Village of Unga is committed to annually reviewing the Plan and Tribal staff will work to complete their review responsibilities.

## M.8.2 Continued Public Involvement

The Native Village of Unga is dedicated to continued public involvement over the next five years.

The Native Village of Unga will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2032.

Future engagement should also provide opportunities for Tribal citizens and other community knowledge holders to identify new local observations, environmental changes, subsistence-related impacts, traditional access concerns, and other knowledge relevant to hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where Indigenous Knowledge or other community-provided information is considered for incorporation into the MJHMP, appropriate attention should be given to Tribal review, attribution, sensitivity, and preferences regarding public disclosure.

## M.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The Native Village of Unga jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The Tribal Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### M.8.3.1.1 Implementing

Upon adoption of the Plan, the Native Village of Unga will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The Native Village of Unga will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### M.8.3.1.2 Monitoring

The Native Village of Unga will monitor the progress of mitigation actions on an annual basis. The Tribal Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### M.8.3.1.3 Evaluating

The Native Village of Unga will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

### M.8.3.1.4 Updating

The Native Village of Unga will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.7. The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Annual reviews should also consider whether new Indigenous Knowledge, local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

Figure M-45 provides a visual of the HMP plan maintenance activities per year.

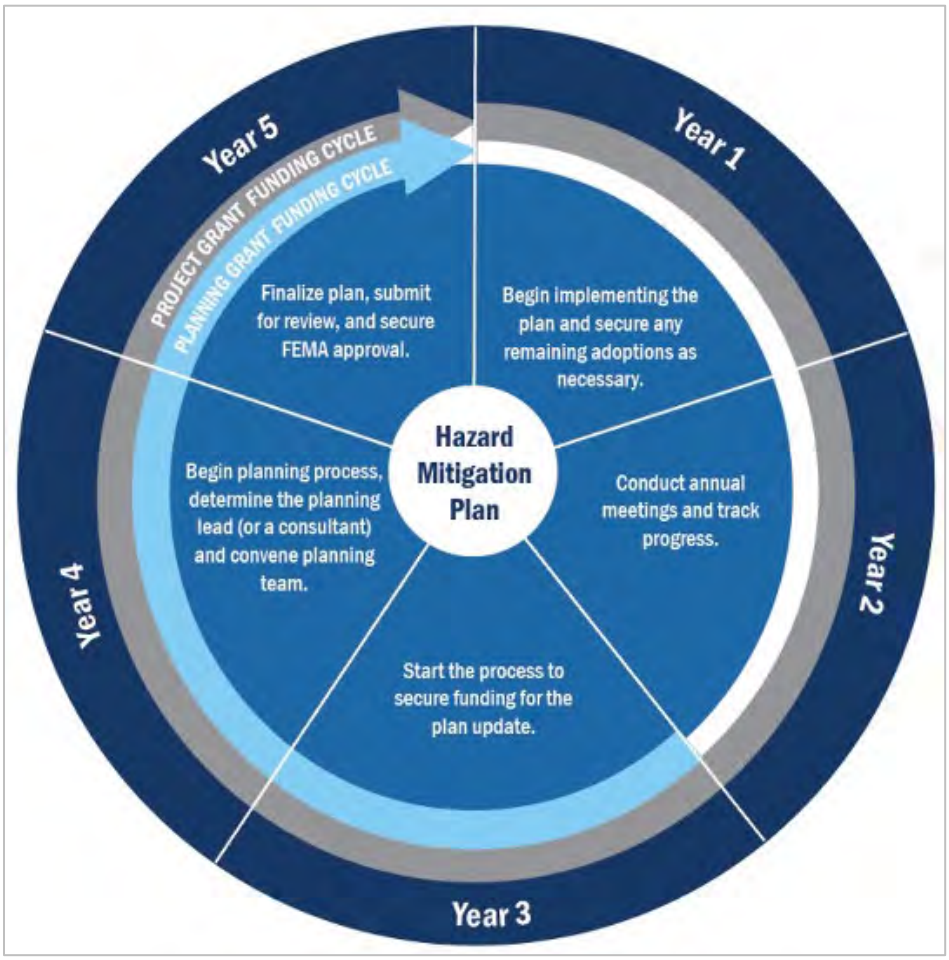



**Figure M-45- HMP Update Schedule**

## M.8.4 Plan Integration

The Native Village of Unga will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other planning and implementation processes, when appropriate including other FEMA programs and initiatives.

The Native Village of Unga will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include comprehensive and land use planning processes, economic development planning, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects as well as the upcoming APIA Regional Adaptation Plan.

As the plan is implemented, the Native Village of Unga will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

## M.9 Plan Adoption

The Unga Tribal Council formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

### M.9.1 Tribal Assurances

The Native Village of Unga assures that the Tribal Planning Team and Tribal Council will comply with applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding (including 2 CFR Parts 200 and 3002) and will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes.

[insert signed adoption resolution]

# N. Native Village of Nelson Lagoon



Photo Credit: Aleutians East Borough

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# N.1 Planning Team and Tribal Definition of Public

## N.1.1 Planning Team

| Name | Role/Position |
|---|---|
| **Angela Johnson** | Tribal President |
| **Samantha McNeley** | Tribal Council Member |
| **Melinda Johnson** | Health Aide |
| **Felicia Johnson** | Tribal Employee |
| **Darren Johnson** | Water Treatment Plant Operator |
| **Mark McNeley** | Climate Resiliency Coordinator |
| **Contractor Team** | |
| **Laura Young** | Project Manager- Fairweather Science |
| **Olivia Kavanaugh** | Risk Assessment Lead- Fairweather Science |
| **Lizzy Dean** | Mitigation Strategy Lead- Fairweather Science |
| **Malcolm Yerkes** | Planner- Fairweather Science |
| **Cooper Calahan** | Planner- Fairweather Science |
| **Mason Page** | Planner- Fairweather Science |
| **Kymmie Scott** | Tribal Planning Specialist- Tidal Basin |
| **Aleutian Pribilof Islands Association Project Team** | |
| **Sue Unger** | APIA Project Manager<br>Environmental Projects Specialist |
| **Karen Pletnikoff** | Environmental & Safety Program Administrator |
| **Edgar Pinzon** | Senior Scientist |

## N.1.2 Tribal Definition of Public

For purposes of public involvement in the HMP Update planning process, the Native Village of Nelson Lagoon defines the “public” as anyone living or working in Nelson Lagoon, including individuals who are not enrolled members of the Native Village of Nelson Lagoon Tribe. The public also includes Tribal members enrolled in the Native Village of Nelson Lagoon Tribe who do not currently reside in Nelson Lagoon.

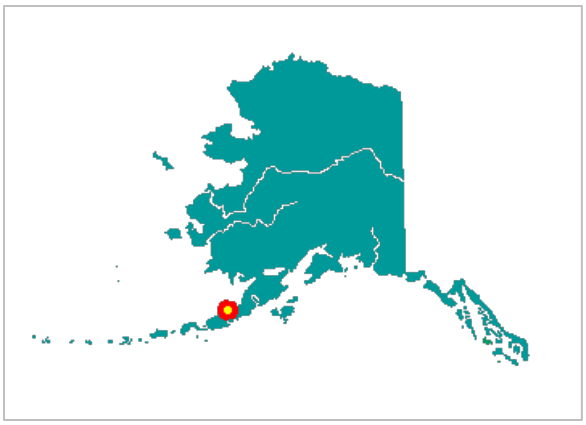
This definition ensures that anyone who lives or works within the community, as well as enrolled Tribal Members residing outside the community, is eligible to attend and participate in the public involvement portion of the HMP Update planning process.

# N.2 Community Profile

## N.2.1 Location and Geography

Nelson Lagoon is located on the northern coast of the Alaska Peninsula, on a narrow sand spit that separates the lagoon from the Bering Sea. It is 580 miles southwest of Anchorage. It lies at approximately 56.0012º north latitude and -161.2019º west longitude. The width of the spit is approximately 1,900 feet near the community. The community is located on a series of vegetated sand dunes gradually increasing in size to the north to an elevation of approximately 20 to 30 feet.

Nelson Lagoon is accessible only by air and sea. A State-owned gravel runway serves regularly scheduled flights. It has a dock, boat ramp, harbormaster's office, and warehouse. Some freight is landed at the Peter Pan Seafoods dock, 30 miles away at Port Moller.



## N.2.2 History

Nelson Lagoon was used historically as an Unangan summer fish camp. The resources of the lagoon and nearby Bear River are excellent. The lagoon was named in 1882 for Edward William Nelson of the U.S. Signal Corps, an explorer in the Yukon Delta region between 1877 and 1920. In the 1800s, Arthur Johnson, a common family name in Nelson Lagoon to this day, operated a saltery in the lagoon. Pacific American Seafoods operated a salmon saltery from 1906 to 1917 on Heart/Egg Island in the lagoon, which attracted Scandinavian fishermen. The operation moved to Port Moller, and Pacific American Seafoods became Peter Pan Seafoods. In 1965, a school was built, and the community began to be occupied year-round. While the community itself is relatively new, the residents and families that make up the community have ties to this land that go back generations.

## N.2.3 Population

The Tribal Village of Nelson Lagoon is an unincorporated, census designated place. The 2020 U.S. Census recorded a total population of 41. The DCRA has estimated a population of 31 in 2025. The 2024 American Community Survey Demographics and Housing estimates reports a population of 78 with a margin of error of ±35.

## N.2.4 Demographics

The 2020 U.S. Census reports the following demographic data:

## N.2.5 Economy

The economy of Nelson Lagoon has always centered around subsistence activities and more recently commercial fishing, from the early commercial canneries of the 19th and 20th centuries to modern dishing fleets.

The introduction of commercial fishing and its related infrastructure began attracting new populations to the region, such as the Scandinavian fishermen bringing their catch to the Pacific American Seafood site in the lagoon. In the 1980s, 130 commercial fishing boats operated during the Sockeye season. Much of the catch went to Peter Pan seafoods in Port Moller for $0.60/lb. Additionally, the Akutan, a processing ship, would stop in the lagoon to buy and process catch. Many of these fishing boats were privately, locally owned, an improvement on prior boat lease agreements with Pacific American Fisheries. In 2010, residents held 26 commercial salmon fishing licences, though this is still only a summer enterprise. Outside of the salmon season, many residents turn their attention to subsistence hunting and gathering. Additionally, Nelson Lagoon is a member of the APICDA Groundfish Community Development Quota (CDQ) and coordinates a

local chapter of APICDA Fishermen's Association. This former aims to support and generate opportunities in historically disadvantaged economies, particularly with a focus on the investment in groundfish, halibut, and crab fisheries. The latter has a similar mission and grant making capabilities.

Outside of fisheries, there are a several seasonal and year-round enterprises in Nelson Lagoon. The APICDA operates a gear and vessel storage company in conjunction with the Nelson Lagoon Tribal Council. Some of the local businesses focus on charter fishing and hunting trips and associated support, such as seasonal lodging or restaurants.

Supplying the community has been a perpetual issue. The community receives one barge per year, with many supplies arriving at Port Moller twice per year, but 30 miles away. Food can be supplied by air from Akutan or Cold Bay, but all the above options come at a high cost to the residents of Nelson Lagoon.

These conditions increase the importance of locally harvested foods as both a subsistence resource and a component of household economic resilience.

### N.2.6 Land Use

Due to the provisions of the ANCSA, the regional and village native corporations received title to property in their traditional lands. The Nelson Lagoon Corporation holds title to significant surface lands while The Aleut Corporation holds title to the subsurface resources.

Nelson Lagoon is an unincorporated, census designated place; the Tribal Council is the only form of local government. The community has no capacity to exercise home rule, meaning there are no local laws or local zoning and land use plans. Because there is no local government, the duties of land use and permitting fall to the Aleutians East Borough, whose central land use legislation is Title 40.

Because of the unincorporated nature of Nelsons Lagoon and the importance of subsistence activities to residents, there have been land use conflicts in the past, especially as they relate to commercial hunting and fishing guide permits. The continued and increased approval of commercial guide permits has limited the availability of subsistence hunt species available to them.

## N.3 Review and Incorporation of Existing Plans, Studies, and Reports

During the planning process, the Planning Team and contractor, Fairweather Science, reviewed available plans, studies, reports, technical research, and other pertinent resources to inform the MJHMP Update.

In addition to the plans, studies, and reports listed in Table 4 of the Base Plan, the following community-specific documents were reviewed.

| Document | Contents Summary | Data Utilization |
|---|---|---|
| **AK-DGGS 2020. Alaska Water Level Watch Flood Events Database. Nelson Lagoon, Storm Surge, November 23, 2020.** | This database includes storm surge events reported in Nelson Lagoon. | Data in this plan was reviewed to inform this HMP Update; specifically, the Risk Assessment section for Flooding. |
| **Alaska Federation of Natives 2018. Erosion and Alaska Native Communities.** | This report is focused on communities in Western and Arctic Alaska, however, it includes information on regional erosion trends relevant to this HMP Update. | Data in this plan was reviewed to inform this HMP Update. |
| **ANTHC 2024. Alaska Native Tribal Health Consortium. The Unmet Needs of Environmentally Threatened Alaska Native Villages.** | This report details climate and environmental threats to infrastructure from erosion, flooding, and permafrost degradation. A representative from Nelson Lagoon participated in the development of this plan and participated in workshops informing the report's assessment and recommendations. | Data in this plan was reviewed to inform this HMP Update, specifically related to erosion and flooding. |
| **A.R. Mahoney 2018. NOAA. Arctic Report Card: Update for 2018.** | This report describes the role of landfast ice in coastal sea ice systems. | Data in this plan was reviewed to inform this HMP Update, specifically to inform the Risk Assessment section for changes in cryosphere – sea ice. |
| **Buzard, R. et al. 2024. Current and Projected Flood Exposure for Alaska Coastal Communities.** | This report used observation-based methods to estimate record flood elevations in Alaska communities. | Data in this plan was reviewed to inform this HMP Update; specifically, historic records were reviewed for inclusion in the Risk Assessment Flooding Profile. |
| **Denali Commission 2019. Statewide Threat Assessment: Identification of Threats from Erosion, Flooding, and Thawing Permafrost in Remote Alaska Communities.** | This report assessed threats to public infrastructure associated with erosion, flooding, and thawing permafrost and evaluated the combined threat of these hazards. | Data in this plan was reviewed to inform this HMP Update; specifically, evaluations of hazard risk for erosion and flooding in Nelson Lagoon were included in this HMP Update. |
| **IPCC 2019. IPCC Special Report on the Ocean and Cryosphere in a Changing Climate** | This report assesses new data on how the ocean and cryosphere have and are expected to change, as well as associated risks, | Data in this plan was reviewed to inform this HMP Update; specifically, to inform the Future Climate Conditions sections in the Risk Assessment. |

| Document | Contents Summary | Data Utilization |
|---|---|---|
| | opportunities, and mitigation strategies. | |
| **Stuart-Rasi, S. 2026. KUCB. Nelson Lagoon Faces Water Crisis After Storm Damages Pipelines. March 12, 2026.** | This news article details damages to the Nelson Lagoon water pipeline after a storm in 2026. | Information and local accounts included in this report were reviewed and included in this HMP Update, specifically in the Risk Assessment Severe Weather section. |
| **UAF ACCAP 2026. University of Alaska Fairbanks Alaska Center for Climate Assessment and Preparedness Sea Ice Atlas Report for Alaska and the Arctic 1850 to December 2025.** | Historical sea ice extent. | Data in this plan was reviewed to inform this HMP Update. |
| **USACE 2009. Alaska Baseline Erosion Assessment, Study Findings and Technical Report. U.S. Army Corps of Engineers Alaska District. March 2009.** | This baseline erosion assessment indicates that erosion has occurred in Nelson Lagoon. It assigned Nelson Lagoon as a "Monitor Conditions Community", meaning it has reported significant impacts related to erosion. | Data in this plan was reviewed to inform this HMP Update; specifically, the Risk Assessment section for Sediment Deterioration and Land Destabilization. |
| **USACE 2007. Alaska Baseline Erosion Assessments.** | This erosion information paper describes erosion trends in Nelson Lagoon and is current as of September 24, 2007. | Data in this plan was reviewed to inform this HMP Update; specifically, the Risk Assessment section for Sediment Deterioration and Land Destabilization. |
| **USCG 2025. Arctic and Western Alaska Area Contingency Plan. U.S. Coast Guard Sector Western Alaska and U.S. Arctic and State of Alaska Department of Environmental Conservation.** | This is an operational plan intended to support individuals in response roles in the Arctic and Western Alaska Area. | Data in this plan was reviewed to inform this HMP Update. |
| **Vaught, D. 2016. Nelson Lagoon, Alaska Wind and Solar Resource Assessment Report.** | This report summarizes wind data to inform the development of wind energy resources. | Data in this plan was reviewed to inform this HMP Update; specifically, the Severe Weather section of the Risk Assessment. |

# N.4 Risk Assessment

## N.4.1 Hazards

The Native Village of Nelson Lagoon Planning Team identified the following natural hazards that may impact their geography/community.

✓ Hazard profiled for this jurisdiction in the MJHMP Update
X Hazard not profiled for this jurisdiction in the MJHMP Update

| | | |
|---|---|---|
| ✓ Changes in the Cryosphere- Sea Ice | ✓ Flood | ✓ Severe Weather |
| X Changes in the Cryosphere- Snow Avalanche | X Ground Failure/Landslide | ✓ Tsunami |
| X Dam Failure | X Invasive Species | ✓ Volcano |
| ✓ Earthquake | ✓ Land Destabilization | X Wildland Fire |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| Cryosphere- Sea Ice | 3- Likely | 3- Critical | Nelson Lagoon is located on the northern coast of the Aleutian Islands, facing the Bering Sea. Nelson Lagoon historically had regular sea ice and now periodically has sea ice during the winter months.<br><br>The Planning Team reports that sea ice used to provide regular seasonal protection from winter storms and high tides. Now Nelson Lagoon experiences severe shoreline sediment deterioration and exposure to the Bering Sea from the lack of sea ice. |
| Cryosphere- Snow Avalanche | Did not profile this hazard | | |
| Earthquake | 4- Highly Likely | 4- Catastrophic | The entire geography of the Native Village of Nelson Lagoon is vulnerable to earthquakes. Nelson Lagoon lies along the Alaska-Aleutian Megathrust, which is an active fault line spanning the length of the Aleutian chain where the Pacific Plate subducts into the mantle beneath the North American Plate. This seismically active region also contains smaller faults capable of producing earthquakes.<br><br>According to the 2023 State of Alaska HMP, Nelson Lagoon is located in an area with the potential of Very Strong perceived shaking from earthquakes. |
| Sediment Deterioration and Land Destabilization | 4- Highly Likely | 3- Critical | The community of Nelson Lagoon is located on a sand spit on the northern side of the Alaskan Peninsula, bounded by the Bering Sea and Bristol Bay to the north, and Nelson Lagoon to the south. The community itself is built upon a series of vegetated sand dunes. Due to the nature of the site, essentially the entire village footprint is susceptible to sediment deterioration and land destabilization from both the Bering Sea and the Nelson Lagoon/Sapsuk River sides of the community. |

| Hazard | Probability | Magnitude/ Severity | Hazard Narrative |
|---|---|---|---|
| | | | Shoreline loss is one of the highest priority hazards affecting the community of Nelson Lagoon; it has been monitored and studied regularly. |
| Flood | 4- Highly Likely | 4- Catastrophic | Nelson Lagoon experiences flood events due to storm surge. According to the Planning Team, these events happen when there is a very high tide paired with any kind of southerly wind. This pushes the water into roadways and causes minor flooding. |
| Ground Failure/ Landslide | Did not profile this hazard | | |
| Severe Weather | 4- Highly Likely | 3- Critical | All of Nelson Lagoon is vulnerable to severe weather events. The Planning Team specifically described impacts from high winds and extreme cold events. |
| Tsunami | 2- Possible | 4- Catastrophic | The majority of critical facilities and infrastructure in Nelson Lagoon are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community. |
| Volcano | 4- Highly Likely | 3- Critical | The entire geography of Nelson Lagoon is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.<br>According to the 2023 State of Alaska HMP, Nelson Lagoon is located in a high volcanic ash hazard level area. |
| Wildland Fire | Did not profile this hazard | | |
| Dam Failure | Did not profile this hazard | | |
| Invasive Species | Did not profile this hazard | | |




**Figure N-1- Native Village of Nelson Lagoon Planning Area**

### N.4.1.1 Changes in the Cryosphere- Sea Ice

#### N.4.1.1.1 Location

Generally, sea ice forms further north in the Bering Sea. However, AEB communities do experience sea ice on and near their shorelines. Nelson Lagoon is located on the northern coast of the Aleutian Islands, facing the Bering Sea. Nelson Lagoon historically had regular sea ice and now periodically has sea ice during the winter months.

In 2026, Bering Sea ice extended as far as the Pribilof Islands - past Nelson Lagoon, Cold Bay, and Unimak Island.

#### N.4.1.1.2 History

According to the Planning Team, sea ice used to provide regular seasonal protection from winter storms and high tides. Now, Nelson Lagoon no longer gets regular sea ice.

*"Sea ice used to form on the Bering Sea beach and create what we call an "ice bench" that would shelter our banks from erosion. Now the bank is never sheltered and we experience severe erosion to our land from the lack of sea ice*." – Angela Johnson, Tribal President, 2026

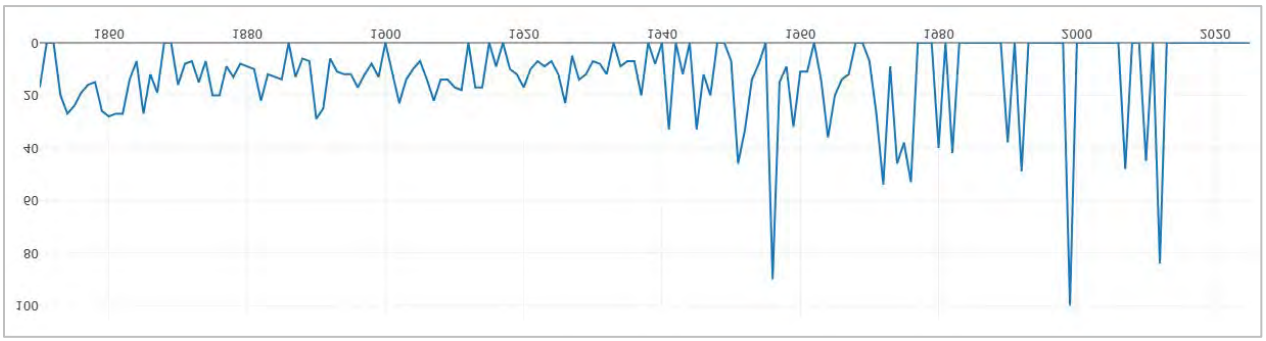
The 2011 *Nelson Lagoon Hazard Impact Assessment* stated:

In conversations with Mr. Mark McNeley (resident of Nelson Lagoon), one of the major changes in the community over the past 20 to 40 years has been the severe reduction in the "ice bench" that historically formed during the winter on the north beach**.** ***He stated that during the 1970s, there used to be large ice benches, possible on the order of 15 feet tall, which were formed from the ocean spray freezing during the winter. These ice benches provided some protection to the sand dunes on the north side of the island against the early spring storms. However, in recent years, these benches have been on the order of two feet tall and provided little protection against the spring storms.*** Mr. McNeley also stated that there have been several instances where the spit has been overtopped during storm events to the west of the community. This is consistent with information prepared by CE2 Engineers which stated that there was evidence the spit was overtopped by waves 1.2 miles east of Coast Lake in 1983 photography and 2.4 miles south of the village in 2001 aerial photography. CE2 also stated that the spit is narrowing at a rate of 10 to 15 feet per year. However, according to Mr. McNeley, to date, the spit has generally filled back in after the overtopping… winter ice and ground freezing help protect the shoreline from waves. If the duration of winter ice and ground freezing is steadily decreasing, a longer time period exists for waves to potentially erode the shoreline.

The Planning Team reported that the river was completely frozen over during the winter of 2025 – 2026, but there was no sea ice on the Bering Sea side. Planning Team members reported that there was some sea ice coverage on the Bering Sea side growing up, but the last big ice year was in 2012. Since then, cold winters have been reported but on the Bering Sea side there has not been a lot of snow or sea ice, according to the Planning Team.

### N.4.1.1.3 Extent

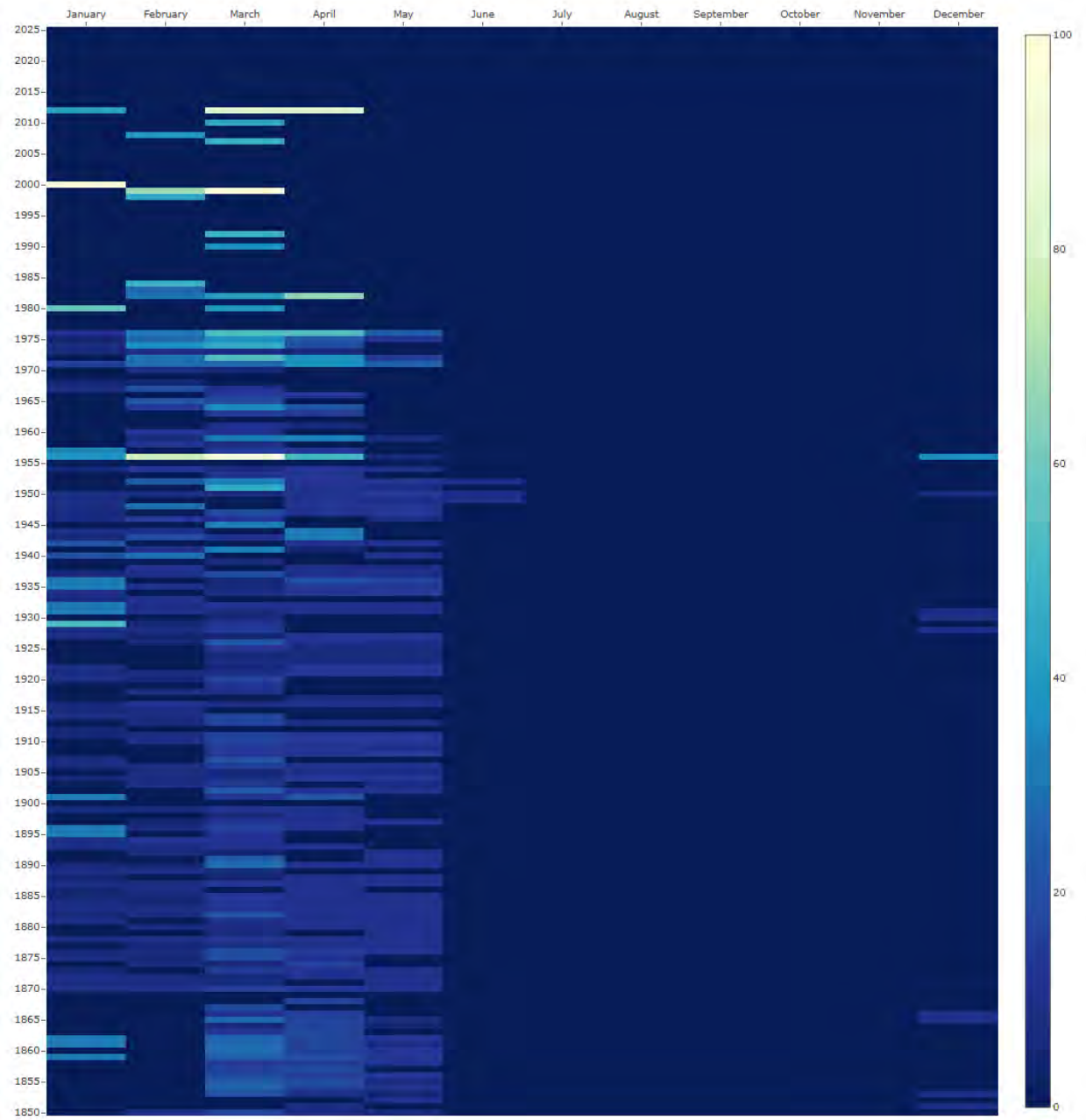
Nelson Lagoon is included in the historical sea ice atlas, created by the University of Alaska Fairbanks Alaska Center for Climate Assessment and Preparedness. It includes sea ice data from 1850 to 2025.



Source: University of Alaska Fairbanks Alaska Center for Climate Assessment and Preparedness Sea Ice Atlas Report

**Figure N-2- March Sea Ice Concentration in Nelson Lagoon, 1850-2025**

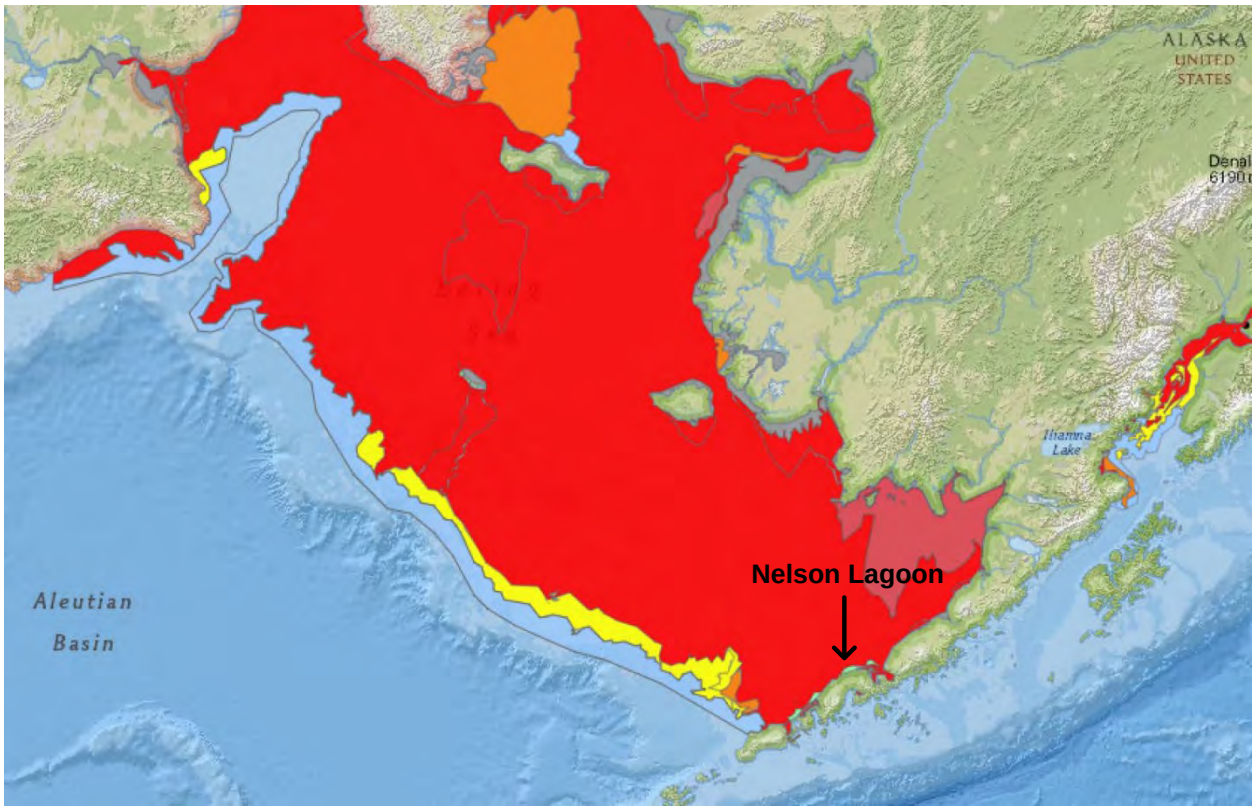
The next figure also shows sea ice concentration in Nelson Lagoon but uses color instead of lines and shows every month for every year. This figure affirms the trends described above, where much of the 20th century saw some winter ice across the months of January through April. Later in the 20th century and into the 2000s, sea ice concentration variability increased, with years of no or very little sea ice concentration, punctuated by years of higher sea ice concentration.




Source: University of Alaska Fairbanks Alaska Center for Climate Assessment and Preparedness Sea Ice Atlas Report

**Figure N-3- Sea Ice Concentration, Nelson Lagoon, 1850-2025**

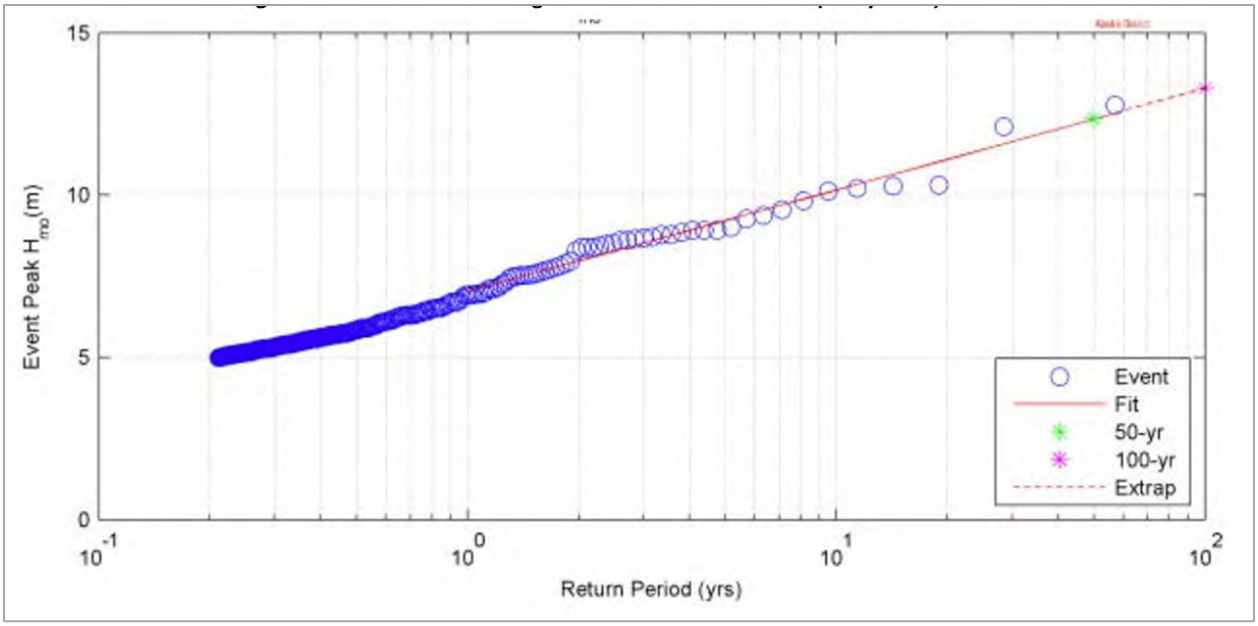
In 2026, Nelson Lagoon experienced sea ice cover. According to the National Weather Service's Alaska Sea Ice Program, the ice was about 10 inches thick, which is thin compared to previous decades (NWS, 2026). shows sea ice extent in the Bering Sea on March 31st, 2026. The areas in red are where 90 to 100% of the water surface is covered by ice. Areas in yellow are 40 to 60% covered in ice.




Source: NWS Alaska Sea Ice Program

**Figure N-4- Sea Ice Extent in the Bering Sea on March 31st, 2026**

A 2011 Hazard Impact Assessment for Nelson Lagoon includes a wave analysis in Nelson Lagoon. This analysis concludes that the 10-year return period for significant wave heights is approximately 33 feet (meaning a wave of this height can be expected on average once every 10 years). The 100-year return period is 44 feet. Wave height in the Bering Sea and the wave height that impacts coastal communities are different. This analysis concludes that a five-foot wave could occur within Nelson Lagoon during a 100-year return period event, meaning that this could occur on average once every 100 years.




Source: Nelson Lagoon Hazard Impact Assessment, 2011

**Figure N-5- Return Period for Significant Wave Heights in Nelson Lagoon**

The Planning Team reported that there was approximately two feet of ice on the river in the winter of 2025 – 2026. This ice could support the weight of a snow machine. The Planning Team reported that the thickness of ice on the Bering Sea side can also be approximately two feet thick.

Based on the extent of past sea ice loss events and the criteria identified in Table 5 of the Base Plan, the extent of sea ice loss in Nelson Lagoon is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### N.4.1.1.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | Sea ice used to provide regular seasonal protection from winter storms and high tides. Now Nelson Lagoon experiences severe shoreline sediment deterioration and exposure to the Bering Sea from the lack of sea ice. Specifically, ice benches used to provide protection to sand dunes on the north side of the island against early spring storms. There have been several instances where the spit has been overtopped during storm events to the west of the community. CE2 engineers reported in 2011 that the spit is narrowing at a rate of 10 to 15 feet per year. |
| Infrastructure | The Planning Team reported that the lack of sea ice leaves the Nelson Lagoon runway exposed to storm surges from the Bering Sea. |
| People | The Planning Team does not report specific previous impacts to people due to changes in sea ice in Nelson Lagoon. |

| Description of Previous Impacts | |
|---|---|
| Utilities | The Planning Team reported that the presence of sea ice has prevented work on the water line. They do not report any previous damages due to the presence of sea ice. |
| Transportation | As noted above, the Planning Team reported that the lack of sea ice leaves the Nelson Lagoon runway exposed to storm surges from the Bering Sea. The Planning Team did not report any damages due to the presence of sea ice, especially because there is not much marine traffic in the winter. |
| Economy | The Planning Team does not report specific previous local economic impacts due to changes in sea ice in Nelson Lagoon. |
| Subsistence Resources | The Planning Team reported that there are stories shared of the connection between sea ice changes and changes in the river ecosystem. According to the Planning Team, sea ice will come in and clean out the river. It will pull out the grass from upriver and help clean out the kelp. Residents in Nelson Lagoon notice that with a lack of sea ice, the river is getting dirtier with kelp and grass which impacts fishing and subsistence. Kelp will also stick on fishing nets, which the fish can sea. “My dad would say fish can smell the fresh water,” reported Nelson Lagoon President Angela Johnson. “When the snow and ice melts, the fish will smell the freshwater coming from where they need to go to spawn”. This local knowledge says that when there is less ice in the river, the fish migrations are impacted. |

#### N.4.1.1.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Likely** that Nelson Lagoon will experience a sea ice loss event in the next three years; there is a 1 in 3 years chance of occurring (1/3=33%); and the history of events is greater than 20% but less than or equal to 33% likely per year.

#### N.4.1.1.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Future climate conditions are not anticipated to influence the nature of sea ice hazards in Alaska. |
| Location | Future climate conditions are likely to influence the location of sea ice changes and associated hazards in Alaska by shifting the typical location of sea-ice loss northward and earlier in the season, resulting in longer periods of open water across the Bering Sea and reducing the likelihood that protective ice will form or persist near the Aleutians East Borough Planning Area. |
| Extent | Future climate conditions are likely to influence the extent of sea ice. The winter Bering Sea Ice cover continues to retreat as a long-term trend with year-to-year variability (State of Alaska DHS&EM 2023). |
| Impact | During the last several decades, Alaska has warmed twice as fast as the rest of the U.S. Sea ice and climate are intimately linked. An ice bench reduces wave development in the open ocean during winter months. Without an ice bench, waves can mechanically erode coastal beaches. Many villages are located along Alaska’s coastline and are threatened by eroding shores.<br><br>Retreat of sea ice is anticipated to disrupt marine ecosystem, impact local communities where sea ice is important for subsistence or tourism, and contribute to increased storm surge, coastal flooding, and sediment deterioration and land destabilization (City of Cold Bay LHMP 2022). The presence of sea ice, which may |

| Description of Future Conditions | |
|---|---|
| | continue to be highly variable from year to year despite a long-term downward trend, may cause delays to freight and damage to marine and coastal infrastructure. |
| Probability of Future Events | Future climate conditions are likely to influence the probability of sea ice cover-related events, especially severe storms, in Nelson Lagoon. Due to the loss of winter sea ice and other factors including increased temperatures and precipitation, Alaska as a whole is projected to see a threefold increase in severe storms (State of Alaska DHS&EM, 2023). |
| Population Patterns | Future climate conditions may influence population patterns as they relate to sea ice hazards, as increased frequency and adverse impacts from severe storms could lead people to relocate from vulnerable coastal areas, or from the community entirely. |
| Land Use Development | Future climate conditions may influence land use development as it relates to sea ice hazards, as an increase in severe storms without sea ice protection could lead to changes in the location of certain land use development activities - such as areas slated for marine infrastructure, residential construction or waste management - that are vulnerable to these severe storms. |
| Subsistence Resources | Future climate conditions are expected to influence subsistence resources as they relate to sea ice hazards. Low winter sea ice extents, which have been seen in the Bering Sea in the last decade, affect the marine ecosystem that supports subsistence resources that are critical to AEB communities' ways of life. Some species are expected to shift northward, such as Pacific Cod. Migration patterns and timing for species including salmon, marine mammals, and subsistence waterfowl are also observed and expected in the future. |

### N.4.1.2 Changes in the Cryosphere- Snow Avalanche

The Native Village of Nelson Lagoon Planning Team did not select this hazard to be profiled in the MJHMP Update.

### N.4.1.3 Dam Failure

The Native Village of Nelson Lagoon Planning Team did not select this hazard for the MJHMP Update. There are no dams in Nelson Lagoon.

### N.4.1.4 Earthquake

#### N.4.1.4.1 Location

The entire geography of the Native Village of Nelson Lagoon is vulnerable to earthquakes. Nelson Lagoon lies along the Alaska-Aleutian Megathrust, which is an active fault line spanning the length of the Aleutian chain where the Pacific Plate subducts into the mantle beneath the North American Plate. This seismically active region also contains smaller faults capable of producing earthquakes.

***According to the 2023 State of Alaska HMP, Nelson Lagoon is located in an area with the potential of Very Strong* perceived shaking from earthquakes (18.0 – 34.0%g)** (Figure N-6). Perceiving shaking maps depict the geographical distribution and magnitude of ground shaking caused by a failure based on the epicenter location. This map focuses on the actual variations in shaking intensity across a region as felt by people and structures.

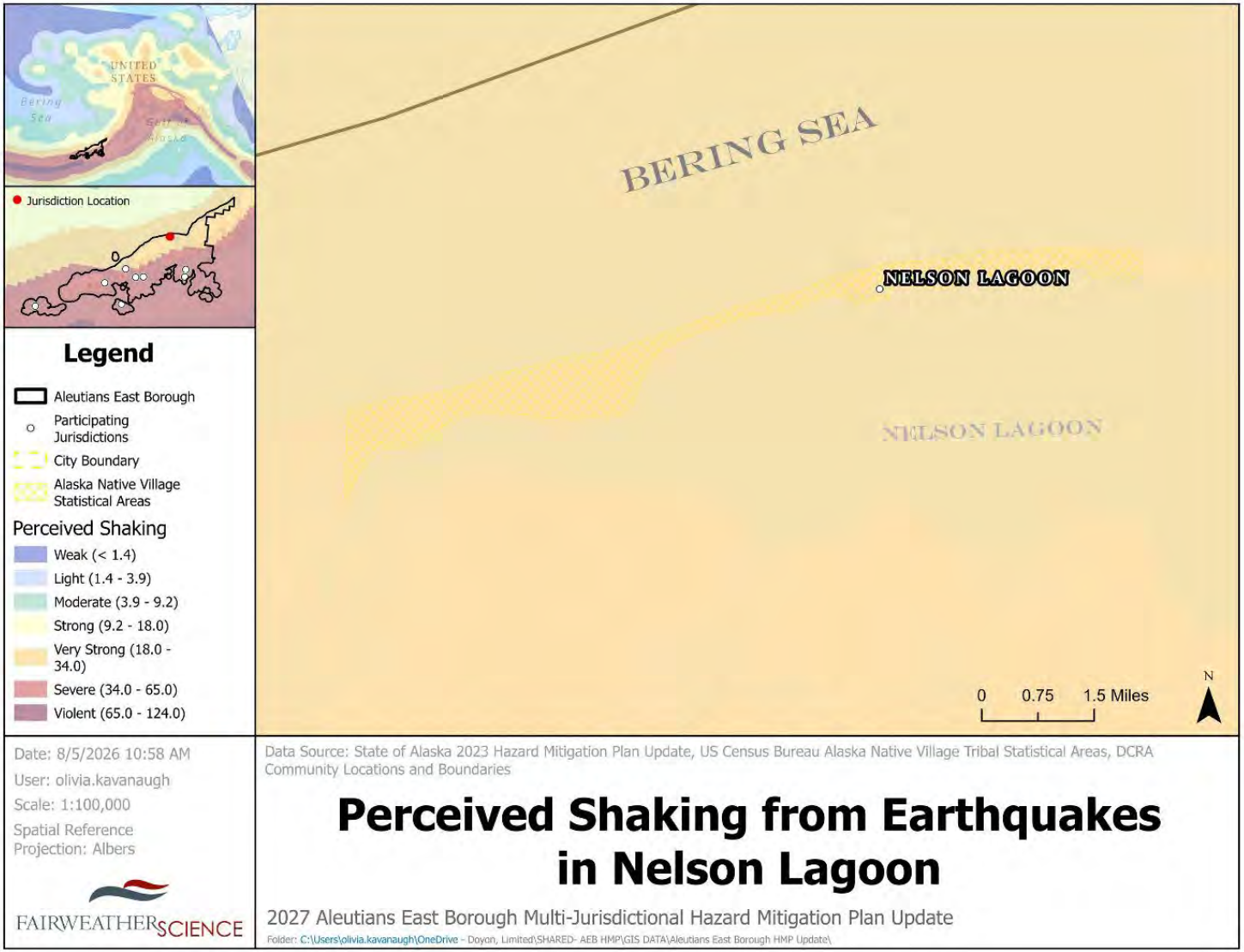



**Figure N-6 - Perceived Shaking from Earthquakes in Nelson Lagoon**

#### N.4.1.4.2 History

Between January 1,1900 and June 29, 2026, 107 earthquakes have been recorded within the AEB boundary with a M6 or greater (USGS 2026). The two largest earthquakes in this radius in the last 20 years are a M8.6 on April 1, 1946 (near Unimak Island) and a M7.6 occurring on October 19, 2020 (near Sand Point) (USGS 2026).

A comprehensive list of the historical earthquakes that have occurred within AEB, including Nelson Lagoon can be found in Table 11 of the Base Plan.

#### N.4.1.4.3 Extent (Magnitude and Severity)

Alaska records 35,000-55,000 seismic events per year, averaging 100-150 earthquakes per day. Based off this data, the area surrounding Nelson Lagoon experiences thousands of nearby earthquakes annually, the majority of which are too small to be felt (AVO 2025).

Based on the extent of past earthquake events and the criteria identified in Table 5 of the Base Plan, the extent of earthquakes in Nelson Lagoon is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### N.4.1.4.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The Planning Team reports feeling the effects of recent earthquakes that originated near Sand Point. Some of these quakes produced visible land movement. Because of the granular sand and gravel makeup of the beach, the relatively high-water table and surrounding ocean and lagoon, and common occurrence of earthquakes, it is possible that the ground beneath the community, particularly saturated soils, may liquefy during earthquake events, though further study would be required to assess the likelihood of liquefaction (NASEM, 2021). |
| Infrastructure | Historical earthquakes impacting the Native Village of Lagoon have resulted in relatively minor physical damage to community infrastructure. Future earthquakes have the potential to flatten structures, damage roadways and dams, and other infrastructure. |
| People | The Planning Team reported that during one recent earthquake, a glass ball fell inside of a residence, causing minor injuries to one person. Aside from this, there are no documented cases of serious injuries or health effects from an earthquake in Nelson Lagoon. Historical earthquakes have generally resulted in felt shaking and resultant hazards (tsunami warnings) rather than widespread harm to residents. |
| Utilities | While strong shaking could damage utility equipment causing outages, there have been no documented cases of earthquakes causing utility disruptions in Nelson Lagoon. |
| Transportation | The primary transportation related impacts from an earthquake in Nelson Lagoon are aircraft and vehicle interruptions. Impacts to air transportation associated with earthquakes are the potential for infrastructure damage to the Airport Terminal and Runway as well as potential tsunami related impacts to floatplanes landing or taking off if a significant wave occurs during that time. A tsunami could also damage boat harbors and marine vessels. Earthquakes of large magnitude have the potential to cause severe damage to roads and other transportation infrastructure. |

| Description of Previous Impacts | |
|---|---|
| Economy | There are no recorded economic impacts due to earthquakes in Nelson Lagoon. |
| Subsistence Resources | There have been no recorded cases of an earthquake in Nelson Lagoon that has impacted the community's access to subsistence resources. |

#### N.4.1.4.5 Probability of Future Events

Nelson Lagoon is located within the Alaska-Aleutian subduction zone, which is one of the most seismically active regions on Earth. Earthquake activity remains one of the highest natural hazards facing Nelson Lagoon. During the past five years, the community experienced numerous earthquakes, including the July 16, 2025, magnitude 7.3 earthquake south of Sand Point, which generated strong ground shaking and a tsunami warning requiring precautionary evacuations. While no major damage occurred, the event demonstrated the community's continued exposure to significant seismic and tsunami hazards.

Given Nelson Lagoon's location along the Alaska-Aleutian subduction zone, future damaging earthquakes remain highly probable and continue to represent one of the Tribe's greatest natural hazard risks.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that there will be an earthquake of any magnitude within 100 miles of Nelson Lagoon within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and based on the history of events, the probability of occurrence is greater than 33% likely per year.

#### N.4.1.4.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of earthquake events in Nelson Lagoon is not anticipated to change in the future. |
| Location | The location of earthquake events in Nelson Lagoon is not anticipated to change in the future. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of earthquakes in Nelson Lagoon. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of earthquakes in Nelson Lagoon. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future earthquake events in Nelson Lagoon. Earthquakes are impossible to predict. |
| Population Patterns | Due to the unknown location of earthquake hazards in Nelson Lagoon, it is possible that future earthquakes will impact future population patterns. Depending on the severity of the event, an earthquake in Nelson Lagoon could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Future climate conditions are not anticipated to influence Land Use Development due to earthquakes in Nelson Lagoon. |
| Subsistence Resources | Future climate conditions are not anticipated to influence earthquake related impacts on subsistence resources in Nelson Lagoon. |

### N.4.1.5 Flood

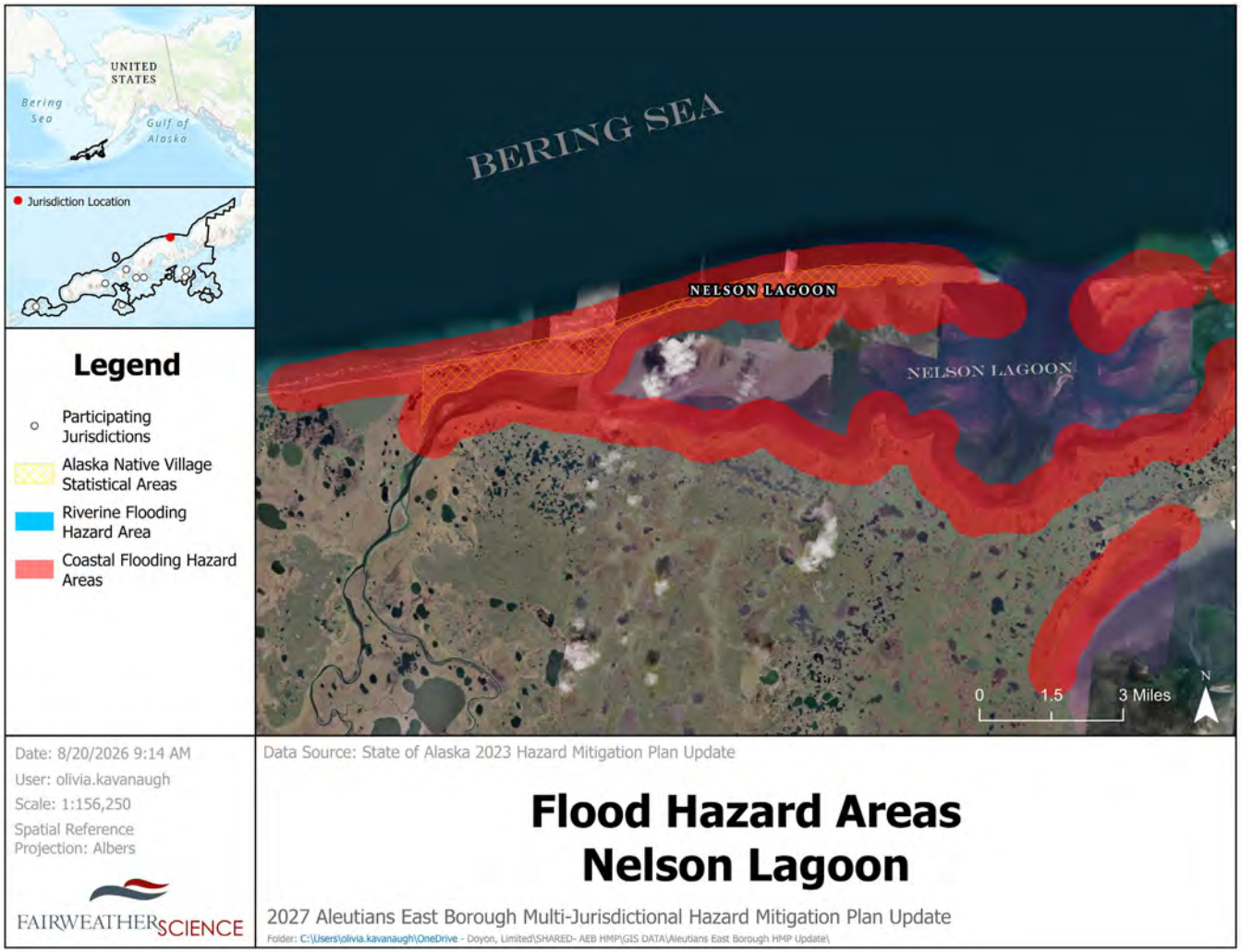
#### N.4.1.5.1 Location

Nelson Lagoon experiences flood events due to storm surge. According to the Planning Team, these events happen when there is a very high tide paired with any kind of southerly wind. This pushes the water into roadways and causes minor flooding. According to the Planning Team, this primarily happens in the fall and winter months.

In Nelson Lagoon, the four primary flood-impacted locations are the airstrip, solid waste disposal site, water transmission line, and coastline fronting the community on the lagoon side. A USACE Identified Linear Extent of Erosion map identifies an area near the junction of the Jeep Trail Road and Airport Road as a place where storm flooding cuts off the road (USACE, 2009).

According to the 2023 State of Alaska HMP, Nelson Lagoon is located within the identified Coastal Flooding Hazard Area (Figure N-7). The State of Alaska identifies coastal flooding hazard areas as areas within 0.5 miles of the coastline (DHS&EM 2023).

Additionally, Nelson Lagoon was included in a study of current and projected flood exposure for 63 Alaska coastal communities. It was the only community in the Aleutians East Borough included. Nelson Lagoon was assigned a category of “minor” for storm-driven flood impacts. The study reports that there are no elevation models or record flood descriptions to complete a full flood exposure analysis for Nelson Lagoon (Buzard, R. et al. 2024).




Note: Methodology for estimating flood hazard areas is consistent with the 2023 State of Alaska HMP Update, which estimates coastal flood hazard areas as 0.5 miles from the shoreline. This estimation is used for planning purposes and does not factor in site-specific characterizations and may over or underestimate flooding extent in the geography.

**Figure N-7- Nelson Lagoon Flood Hazard Areas**

#### N.4.1.5.2 History

In 2019, a water level sensor was installed at the Nelson Lagoon Dock by the University of Alaska Fairbanks Arctic Coastal Geoscience Lab. It is funded by the Alaska Ocean Observing System.

The Alaska Division of Geological & Geophysical Surveys Flood Events Database includes a storm surge event that took place on November 23, 2020, in Nelson Lagoon (AK-DGGS 2020). Figure N-8, Figure N-9, and Figure N-10 are photographs taken during this event. The impacts of this event are pending assessment.



Source: AK-DGGS 2020

**Figure N-8- Storm Surge Event in Nelson Lagoon, November 23, 2020**



Source: AK-DGGS 2020

**Figure N-9- Storm Surge Event in Nelson Lagoon, November 23, 2020**



Source: AK-DGGS 2020

**Figure N-10- Storm Surge Event in Nelson Lagoon November 23, 2020**

#### N.4.1.5.3 Extent (Magnitude and Severity)

The 2019 Denali Commission Statewide Threat Assessment: Identification of Threats from Erosion, Flooding, and Thawing Permafrost in Remote Alaska Communities identified False Pass and Nelson Lagoon as “threatened” communities based on the results of the USACE’s Alaska Baseline Erosion Assessment, completed in 2009.

The Denali Commission’s Statewide Threat Assessment aggregated the vulnerability of 187 Alaskan communities across three threats – erosion, flooding, and thawing permafrost – into one overall vulnerability ranking. The community ranked lowest (number 1) has the highest vulnerability. The community ranked highest (number 63) has the lowest vulnerability. Of these 187 communities, Nelson Lagoon received a community ranking of number 58. Some communities received the same ranking, indicating equal threat rankings.

A closer examination of the individual threat ranking shows Nelson Lagoon ranking 55 out of 63 for the threat of flooding (Denali Commission, 2019). While 187 communities were assessed, these rankings are out of 63 because many communities received the same numerical ranking for flood threat.

The Planning Team reports that flood waters have reached over 6 inches in the community. They report that maximum flood water depth has been at least two feet deep, coming right up underneath the door of a truck. This water depth is significant enough that people do not drive through it with their vehicles. Water is pushed into roadways, flooding roads that provide access to vital areas like the airport, fuel farm, and power plant. The Planning Team also reported that flooding happens along a couple of road access points to the beach on the Lagoon side of town. Every fall, residents stack gravel and sand from the beach at those entrances as a barrier.

Based on the extent of past flooding events and the criteria identified in Table 5 of the Base Plan, the extent of flooding in Nelson Lagoon is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### N.4.1.5.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The Planning Team reports that with storm surge and sea level rise, the river side of the community is experiencing shoreline sediment deterioration. |
| Infrastructure | According to the Planning Team, flooding pushes water into roadways, flooding roads that provide access to vital areas like the airport, fuel farm, and power plant. Shoreline sediment deterioration associated with storm surge and sea level rise puts infrastructure at risk, and some land destabilization is occurring right in front of people's homes. |
| People | The Planning Team reported that flooding on roadways can make transportation and mobility around Nelson Lagoon difficult. It takes a few days, or up to a week, for flood waters to subside. The Planning Team also reported that flooding can be hard on vehicles, and it is difficult and expensive to get vehicle parts in Nelson Lagoon. |
| Utilities | The Planning Team did not report specific previous utility impacts due to flooding in Nelson Lagoon. |
| Transportation | The Planning Team reports that flooding pushes water into roadways, flooding roads that provide access to vital areas like the airport, fuel farm, and power plant. The road to the airport was specifically reported as an area that gets flooded, making it difficult to access the airport.<br>The Planning Team also reported that flooding happens along a couple of road access points to the beach on the Lagoon side of town. Every fall, residents stack gravel and sand from the beach at those entrances as a barrier. |
| Economy | The Planning Team did not report specific previous local economic impacts due to flooding in Nelson Lagoon. |
| Subsistence Resources | The Planning Team did not report specific previous subsistence impacts due to flooding in Nelson Lagoon. |

#### N.4.1.5.5 Probability of Future Events

The Planning Team reported that flood events occur multiple times per year. In the last 5 years, they report that flood events occur approximately 3 to 4 times per year.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** Highly Likely that Nelson Lagoon will experience a flooding event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### N.4.1.5.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | Generally, the nature of flooding is not expected to change due to future climate conditions. |
| Location | It is possible that future climate conditions may influence the location of future flood hazard areas in Nelson Lagoon as warmer temperatures and increased precipitation inundate streams already prone to flooding or smaller streams not historically flooded. Additionally, as sea ice continues to decline in the Bering Sea it is possible that stronger storms will bring coastal flooding to locations not previously inundated. |
| Extent (Magnitude/ Severity) | According to listening sessions on the Aleutian Islands and Southwest Alaska conducted by the USDA, residents are observing “less sideways snow and more rain… mid-winter melt”. Warming air temperature drives the timing of mountain snowpack melt and effects river levels (USDA, 2021).<br><br>As heavy rainfall and atmospheric river events become more frequent, the magnitude and severity of rainfall run-off flooding in Nelson Lagoon is likely to increase. As mid-winter temperature shifts become more frequent and variable, the extent of snowmelt flooding may increase. |
| Impact | As the probability of annual precipitation increases in Nelson Lagoon, so does the potential of flooding, which increases the potential impacts to residents and infrastructure in Nelson Lagoon. |
| Probability of Future Events | The probability of future flooding events is likely to increase due to increasing precipitation and heavy rainfall events.<br><br>According to the EPA and NOAA records, coastal flooding events are increasing in frequency in Alaska (EPA 2022). According to the States at Risk Climate Change Preparedness Report Card, Alaska's coastal floodplain is expected to expand by over 15,000 square miles, which accounts for the greatest increase of any state (States at Risk 2015).<br><br>According to the International Panel on Climate Change’s 2025 Arctic Report Card, the Aleutian Islands are considered “Sub Arctic”. Across the Arctic, increasing river runoff and increasing heavy precipitation are noted, with high confidence of likelihood (Ranasinghe et al., 2021). A higher percentage of precipitation as rainfall is expected, as opposed to snowfall (Ranasinghe et al., 2021). This is also noted with a high confidence level. Coastal floods/shoreline loss are expected to increase, with medium confidence (Ranasinghe et al., 2021).<br><br>Additionally, sea ice plays a buffering role, protecting the coastline from severe winter storms and associated flooding. Sea ice cover loss has accelerated in the Arctic since 2011 (Fox-Kemper et al., 2021). |
| Population Patterns | It is possible that future flood events will cause changes in population patterns in Nelson Lagoon as future floods may impact more homes, residents, and critical facilities resulting in current residents relocating out of flood prone areas. |

| Description of Future Conditions | |
|---|---|
| Land Use Development | Increased flood events may influence future land use development through zoning regulations that limit development in flood zones. Transportation infrastructure, such as roads, bridges, and culverts, may need to be designed to withstand increased flooding, influencing how and where they are built. There may be a greater emphasis on preserving and restoring natural ecosystems, such as wetlands and floodplains, which can absorb excess water and mitigate flooding risks. |

#### N.4.1.6 Ground Failure/Landslide

The Native Village of Nelson Lagoon Planning Team did not select this hazard for the MJHMP. Historical landslide events have not occurred near the community (Figure N-11).




**Figure N-11- Historical Landslide Events near Nelson Lagoon**

### N.4.1.7 Invasive Species

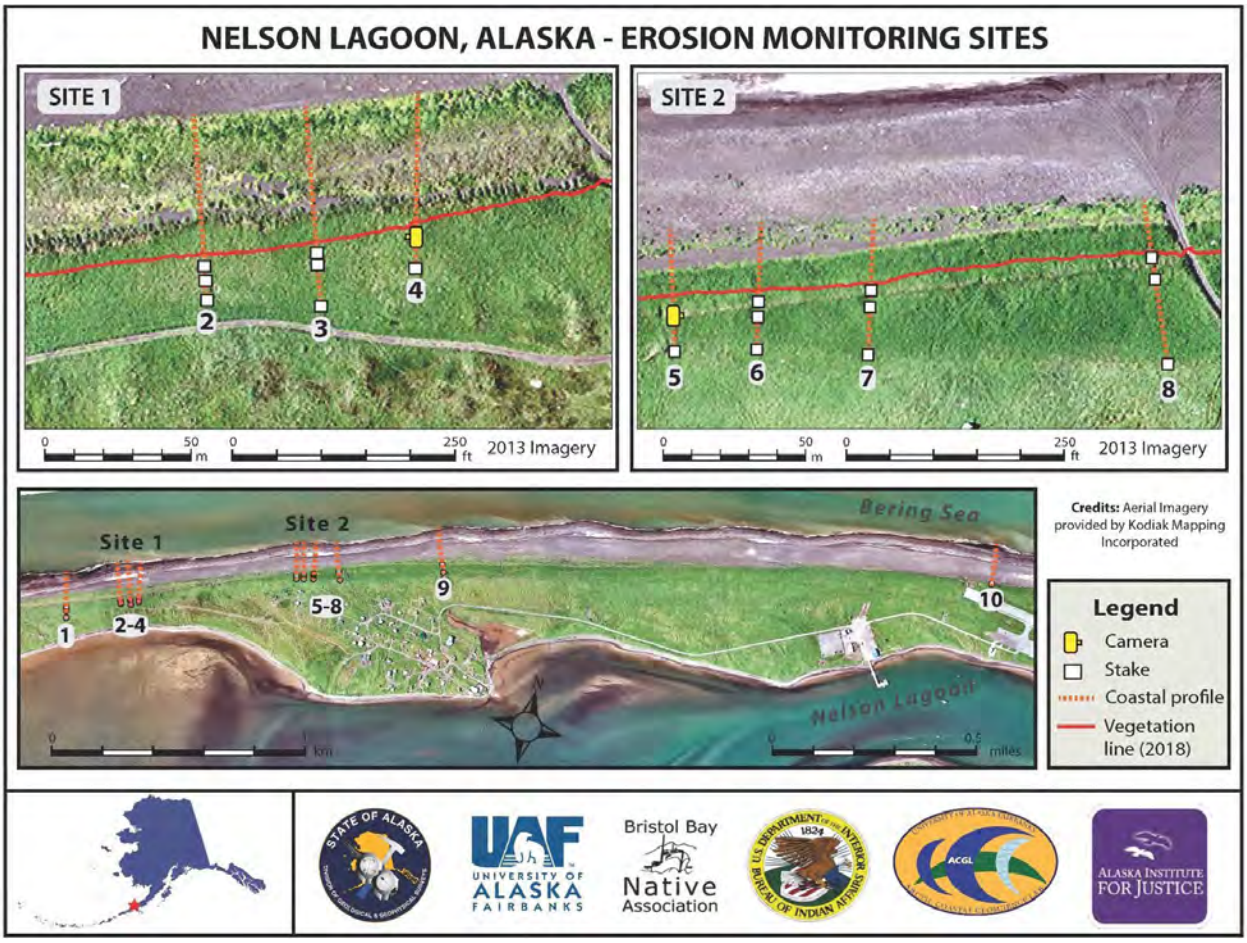
The Native Village of Nelson Lagoon Planning Team did not select this hazard for the MJHMP.

### N.4.1.8 Sediment Deterioration and Land Destabilization

#### N.4.1.8.1 Location

The community of Nelson Lagoon is located on a sand spit on the northern side of the Alaskan Peninsula, bounded by the Bering Sea and Bristol Bay to the north, and Nelson Lagoon to the south. The community itself is built upon a series of vegetated sand dunes. Due to the nature of the site, essentially the entire village footprint is susceptible to sediment deterioration and land destabilization from both the Bering Sea and the Nelson Lagoon/Sapsuk River sides of the community.

Shoreline loss is one of the highest priority hazards affecting the community of Nelson Lagoon; it has been monitored and studied regularly. In 2007, the US Army Corps of Engineers completed the Baseline Erosion Assessment. The study determined that areas along the Nelson Lagoon side of the community are experiencing shoreline loss.




Source: UAF-ACGL 2018

**Figure N-12 – Nelson Lagoon Sediment Deterioration and Land Destabilization Monitoring Sites**

#### N.4.1.8.2 History

Sediment deterioration and land destabilization has always been a concern throughout the history of Nelson Lagoon. According to a Native Village of Nelson Lagoon Planning Team member, in the last 10 years, an underground water transfer line, which is used to pump water from the lake to the treatment plant has been washing out from storm surges and localized destabilization. In January 2026, a severe winter storm impacted the community, resulting in winds up to 60 mph. This storm surge resulted in over 5000 feet of water line being washed out, which eventually led to a local water crisis, with the community being without running water for 50 days.

Riverine sediment deterioration and land destabilization is also a concern for Nelson Lagoon, with the Planning Team reporting destabilization on the river side of the community.

#### N.4.1.8.3 Extent (Magnitude and Severity)

Sediment deterioration and land destabilization is a natural phenomenon that occurs to practically every stream, river, and coastline on earth. Due to changes in local weather patterns, the magnitude and severity of sediment deterioration and land destabilization vary throughout select communities. In 2019, the Denali Commission created a Statewide Threat Assessment that identified 144 Alaskan communities that are likely to face some degree of infrastructure damage from erosion, flooding, and/or permafrost thaw (DGGS 2021). To identify risk, communities are grouped into three categories, Groups 1-3, with Group 1 (red) most at-risk, Group 2 (yellow) at moderate risk, and Group 3 (green) at lower risk.

***Nelson Lagoon was categorized in Erosion Group 1, which places it at a higher risk of sediment deterioration and land destabilization according to the study.***

According to the Native Village of Nelson Lagoon Planning Team, over 5,000 feet of water line has been washed out from coastal sediment deterioration and land destabilization resulting from sea level rise and storm surges.

In Nelson Lagoon, the Bering Sea coast side experiences an average loss of 5 ft per year, while the Nelson Lagoon shore experiences 1-2 ft per year (USACE, 2007). According to the Native Village of Nelson Lagoon Planning Team, this rate of sediment deterioration has increased recently on the lagoon side, with at least 4 feet of land being taken away during the 2025-2026 winter season. It is also reported that several cabins along the shoreline that are used for subsistence resources are about to fall in the water due to sediment deterioration and land destabilization. The bank that runs along the airport road is also reported to have experienced rapid sediment deterioration and bank destabilization.

The Planning Team reported that rising sea levels and lack of sea ice contribute to more detrimental winter storms and storm surge, leading to more sediment degradation and deterioration along the coastline. They report that lack of sea ice, rising sea levels, and increase in storm surge all work together in the increased sediment deterioration and land destabilization that Nelson Lagoon experiences. According to the UAF ACGL, the Nelson Lagoon Tidal Sensor, located at the dock, indicates local sea level rise at 0.3 feet per 100 years.

Based on the extent of past sediment deterioration and land destabilization events and the criteria identified in Table 5 of the Base Plan, the extent of sediment deterioration and land destabilization in Nelson Lagoon is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### N.4.1.8.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | Wave action, storm surges, high tides, and high winds drive sediment deterioration and land destabilization in Nelson Lagoon, particularly during storm events.<br>Destabilizing events tend to remove sediment near the community and deposit it along the two ends of the spit. (USACE, 2007).<br>The Bering Sea coast experiences an average loss of 5 ft per year, while the Nelson Lagoon shore experiences 1-2 ft per year (USACE, 2007).<br>The actively destabilized area on the lagoon side of the community has continually encroached upon community infrastructure, the airstrip, and homes. In 2007 the shoreline was less than 100 ft from structures (USACE, 2007). |
| Infrastructure | While sediment deterioration and land destabilization events in Nelson Lagoon have not resulted in significant damage to infrastructure, past damages to the community water system highlights the potential of future infrastructure damages. The runway was specifically noted as being at risk. |

| Description of Previous Impacts | |
|---|---|
| People | Sediment deterioration and land destabilization has not resulted in injuries or fatalities to the residents of Nelson Lagoon. Destabilization has contributed to a water crisis in Nelson Lagoon that has impacted the community's ability to have running water. |
| Utilities | During a 1998 winter storm, sediment deterioration and land destabilization exposed a 3,000 ft section of the community's potable water line. This line then froze, cutting off the water supply to the community. This 10.5-mile line is constantly at risk from sediment deterioration and land destabilization events. The community has planted dune grasses atop the buried line to slow the loss of shoreline. In the 2007 Baseline Erosion Assessment, the community reported having replaced water lines 3 times in previous years due to land destabilization effects (USACE, 2007).<br>During the winter of 2020/2021, sediment deterioration and land destabilization revealed about 1,000 feet of potable water line, again freezing the line and interrupting community water supply (Bogardus et al., 202In January 2026, sustained winds of 60 mph with gusts up to 70 mph revealed roughly 5,000 ft of the community's potable water line, leading to a water crisis and conservation orders. A sudden cold snap following the wind event interrupted water supply from March 18th to May 7th, a total of 50 days (Angela Johnson, Tribal President). |
| Transportation | The airstrip and associated infrastructure and buildings were within 100 ft of the receding shoreline in 2007 (USACE). The Planning Team reported that the runway is at risk from land destabilization. |
| Economy | There are a substantial number of roads and trails in Nelson Lagoon that can experience long term sediment deterioration and land destabilization impacts related to coastal flooding, which can contribute to significant economic impacts for the necessary repairs or mitigation activities. |
| Subsistence Resources | The Planning Team did not report direct impacts to subsistence resources themselves; however, shoreline destabilization is affecting infrastructure that supports subsistence activities. Several shoreline cabins used for subsistence activities are reported to be at risk of falling into the water. Continued land loss may therefore affect subsistence access and supporting infrastructure even where the harvested resource itself is not directly affected. |

#### N.4.1.8.5 Probability of Future Events

The community reports that the loss of winter sea ice since the 1990s has accelerated the rate of shoreline destabilization as the sand spit does not have the protection against winter wind and wave action it once had.

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Nelson Lagoon will experience a sediment deterioration and land destabilization event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### N.4.1.8.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | It is unlikely future climate conditions will influence the nature of sediment deterioration and land destabilization in Nelson Lagoon. |
| Location | It is possible future climate conditions will influence the location of sediment deterioration and land destabilization in Nelson Lagoon. Projected increases in air temperature and changes in precipitation patterns can increase soil saturation and |

| Description of Future Conditions | |
|---|---|
| | ultimately accelerate coastal land destabilization in Nelson Lagoon (AK DGGS 2026). Additionally, according to the UAF ACGL, the Nelson Lagoon Tidal Sensor, located at the dock, indicates local sea level rise at 0.3 feet per 100 years which can expand the amount of coastline exposed to sediment deterioration. |
| Extent (Magnitude/ Severity) | It is likely future climate conditions will influence the magnitude and severity of sediment deterioration and land destabilization in Nelson Lagoon. Increased severity and magnitude of winter storms and increased precipitation are already increasing the severity and magnitude of sediment deterioration and land destabilization events in Alaska, and the trend is expected to continue. According to the UAF ACGL, the Nelson Lagoon Tidal Sensor indicates local sea level rise at 0.3 feet per 100 years which may also contribute to more severe sediment deterioration as rising seas allow waves and tides to reach further inland and potentially strike shorelines with greater force. |
| Impact | It is likely future climate conditions will influence the impacts of sediment deterioration and land destabilization events in Nelson Lagoon. Projected increases in precipitation intensity may increase the impacts of sediment deterioration by affecting infrastructure and transportation corridors (AK DGGS 2026). |
| Probability of Future Events | It is likely future climate conditions will influence the probability of sediment deterioration and land destabilization in Nelson Lagoon. Although the probability for land destabilization is location-specific, the probability is likely, and increasing, due to environmental factors, such as increased precipitation intensity and sea-level rise. |
| Population Patterns | It is possible future climate conditions will influence population patterns in Nelson Lagoon. Continuation or increased frequency of sediment deterioration and land destabilization could cause residents to move out of hazard areas or relocate out of Nelson Lagoon entirely. |
| Land Use Development | It is possible future climate conditions will influence future land use development in Nelson Lagoon. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from developing land in areas impacted by land destabilization. |
| Subsistence Resources | It is possible future climate conditions will influence subsistence resources in Nelson Lagoon. Due to an increase in precipitation events, the likelihood of sediment deterioration and land destabilization will increase, which could prevent residents from accessing subsistence areas impacted by land destabilization. |

### N.4.1.9 Severe Weather

#### N.4.1.9.1 Location

All of Nelson Lagoon is vulnerable to severe weather events.

#### N.4.1.9.2 History

Severe weather events occur annually in Nelson Lagoon.

A storm in the winter of 2026 washed out two miles of pipe that had just been reburied the previous fall, according to the Native Village of Nelson Lagoon. The community worries about its water supply, as the above-ground pipe is susceptible to freezing temperatures (Stuart-Rasi, S. 2026).



Source: Angela Johnson

**Figure N-13- January 2026 Storm Washes out Pipeline in Nelson Lagoon**

#### N.4.1.9.3 Extent (Magnitude and Severity)

According to a wind and solar resource assessment report completed in 2016, Nelson Lagoon has a mean annual wind speed of 6.67 m/s, with constant prevailing winds of 20 to 25 mpg. The maximum gust speed recorded between May 2012 and March 2013, and September 2014 and March 2015, was 32.2 mph (Vaught, D. 2016).

Nelson Lagoon has a maritime-influenced climate with average monthly temperatures varying from a low of 29.1 °F in February to a high of 52.7 °F in August (Vaught, D. 2016).

Based on the extent of past severe weather events and the criteria identified in Table 5 of the Base Plan, the extent of severe weather in Nelson Lagoon is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### N.4.1.9.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The Planning Team reports that high winds is a driving factor of the shoreline destabilization along the Bering Sea and Nelson Lagoon sides of the community. This wind action is transporting sediment from area around the community to the ends of the spit, which is actively accreting land. |
| Infrastructure | The Planning Team did not report specific previous infrastructure impacts due to severe weather in Nelson Lagoon. |
| People | The Planning Team did not report specific previous impacts to people due to severe weather in Nelson Lagoon. |
| Utilities | A winter storm in 2026 washed out two miles of pipe exposing it to freezing temperatures and threatening the community's water supply. The Planning Team did not report other specific previous impacts in this category in Nelson Lagoon. |
| Transportation | The Planning Team did not report specific previous transportation impacts due to severe weather in Nelson Lagoon. |
| Economy | The Planning Team did not report specific previous economic impacts due to severe weather in Nelson Lagoon. |
| Subsistence Resources | The Planning Team did not report specific previous subsistence impacts due to severe weather in Nelson Lagoon. |

#### N.4.1.9.5 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** that Nelson Lagoon will experience a severe weather event (dense fog, extreme cold, heavy rain, heavy snow, or high winds), within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

### N.4.1.9.6 Future Climate Conditions

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| Nature | It is unlikely that future climate conditions will influence the nature of future dense fog events in Nelson Lagoon. | It is unlikely that future climate conditions will influence the nature of future drought/water supply events in Nelson Lagoon. | It is unlikely that future climate conditions will influence the nature of future extreme cold events in Nelson Lagoon. | It is unlikely that future climate conditions will influence the nature of future heavy rain events in Nelson Lagoon. | It is unlikely that future climate conditions will influence the nature of future heavy snow events in Nelson Lagoon. | It is unlikely that future climate conditions will influence the nature of future high wind events in Nelson Lagoon. |
| Location | It is unlikely that future climate conditions will influence the location of future dense fog events in Nelson Lagoon. | It is possible that future climate conditions will influence the location of future drought/water supply events in Nelson Lagoon. | It is unlikely that future climate conditions will influence the location of future extreme cold events in Nelson Lagoon. | It is unlikely that future climate conditions will influence the location of future heavy rain events in Nelson Lagoon. | It is unlikely that future climate conditions will influence the location of future heavy snow events in Nelson Lagoon. | It is unlikely that future climate conditions will influence the location of future high wind events in Nelson Lagoon. |
| Extent | Due to a projected increase in future precipitation in the Aleutians East Borough over the next few decades, the magnitude and severity of dense fog events in Nelson Lagoon could increase (UAF/SNAP 2025). | In Nelson Lagoon, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+11°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026).<br>Climate changes within Alaska is likely to result in increased drought and longer fire seasons as the spring season is projected to become warmer and drier (Alaska DHS&EM 2023). | In Nelson Lagoon, average annual temperatures may increase by about 9°F by the end of the century. (UAF/SNAP 2026).<br>Winter temperatures are projected to increase the most (+11°F), with winter potentially transitioning from below freezing to above freezing temperatures in the future (UAF/SNAP 2026). | It is likely future climate conditions will influence the magnitude and severity of heavy rains events in Nelson Lagoon. Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (2023 State of Alaska HMP).<br>Extreme precipitation events have occurred throughout Alaska with increasing frequency.<br>In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026). | In southern and coastal parts of Alaska, large decreases in spring snowpack are expected by the mid-21st century, even with more winter precipitation because temperatures warm to above freezing, causing a shift from snow to rain or more melt during the winter (NPS 2020, UAF/SNAP 2026).<br>Nelson Lagoon experiences severe storm conditions in the wintertime. This could shift towards heavier rainstorms in the future due to rising temperatures, especially in the winter months.<br>Climate scientists have suggested that warming temperatures, caused by the increase of greenhouse gases in the atmosphere, may be enabling longer and more intense cycles of droughts, floods, and winter storms (NPS 2020). | High-wind events are projected by models to become more frequent in Alaska, with changes most noticeable in the northern and western coastal regions of Alaska (2023 State of Alaska HMP). |
| Impact | Projected increases in precipitation and associated moisture availability in Nelson Lagoon could contribute to more frequent or persistent dense fog events, particularly when combined with the region's cool marine conditions (UAF/SNAP 2026).<br>Reduced visibility from denser or longer-lasting fog could increase hazards for aviation, marine navigation, and roadway travel. | Overall temperature trends in Nelson Lagoon are projected to increase; with estimated winter temperature increases of approximately +11°F by the end of the century (UAF/SNAP 2026).<br>Potential impacts such as health concerns, water supply issues, and increased land destabilization and sediment transport due to drier soils associated with drought events remain possible for communities in the Aleutians East Borough (Alaska DHS&EM 2023). | While overall temperature trends in Nelson Lagoon are projected to increase, with estimated winter temperature increases of approximately +11°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Potential impacts such as transportation disruptions, health concerns, and damage to infrastructure (including frozen pipes and loss of utilities) associated with extreme cold events remain possible for communities in the Aleutians East Borough. | In Nelson Lagoon, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026).<br>As precipitation increases, impacts associated with heavy rainfall (localized flooding, landslide potential, roadway washouts, etc.) will increase. | Within the next century, climatically driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (NPS 2020). Projected future impacts are expected to reduce snowpack (AK HMP 2023).<br>Winter is likely to have more precipitation, but winter may transition from below freezing to above freezing in the future meaning less heavy snowfall events and more precipitation falling as rain (UAF/SNAP 2026). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). A lack of snowpack during winter could also lead to less runoff to maintain reservoir | As high wind events are projected to increase (NOAA 2025), impacts from high wind events may increase. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | | | | levels.<br>The impacts from heavy snow events – such as property and infrastructure damage, transportation disruptions, road and vehicle impacts, and snow avalanches – may be less frequent due to future climate conditions creating less days below freezing. | |
| Probability of Future Events | Future climate conditions, including projected increases in precipitation, will likely increase the probability of dense fog events in Nelson Lagoon by providing greater atmospheric moisture under the region's cool marine climate. | Overall temperature trends in Nelson Lagoon are projected to increase; with estimated winter temperature increases of approximately +11°F by the end of the century (UAF/SNAP 2026). In the AEB, annual precipitation has increased by 2% over the past 50 years (ACCAP 2026).<br>In Nelson Lagoon, models have higher uncertainty regarding precipitation, but winter is likely to have more precipitation (+24%) (UAF/SNAP 2026).<br>Although increased precipitation may constrain the overall frequency or duration of drought events, episodic events of no precipitation may continue to occur due to climate variability. | While overall temperature trends in Nelson Lagoon are projected to increase, with estimated winter temperature increases of approximately +11°F by the end of the century (UAF/SNAP 2026), extreme cold events are still likely to occur in the future.<br>Although warming conditions may reduce the overall frequency or duration of extreme cold, episodic events like the winter 2025/2026 extreme cold event may continue to occur due to climate variability. | In Nelson Lagoon, winter is likely to have more precipitation (UAF/SNAP 2026).<br>Given the moderating effect of the ocean, this precipitation may fall as rain or snow. With increased precipitation, the impact of heavy rain in Nelson Lagoon may increase. These impacts may include increased flooding and road washouts throughout the community, as well as more landslides and land destabilization being triggered due to increased ground saturation. | Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (ASHMP 2023). Therefore, as winter temperatures continue to increase, the amount of snowfall will decrease and precipitation in the form of rain will be more common in winter months. | Impacts from high winds in Nelson Lagoon have included loss of utilities, damage to buildings and residences, and transportation disruptions and delays. |
| Population Patterns | Future conditions of dense fog are not anticipated to affect future population patterns in Nelson Lagoon. | Future conditions of drought are not anticipated to significantly affect population patterns in Nelson Lagoon. | Future conditions of extreme cold are not anticipated to significantly affect population patterns in Nelson Lagoon. While individual extreme cold events may temporarily affect travel, access, and daily activities, they are unlikely to drive long-term changes in population distribution in the area. | It is not likely that future conditions influencing heavy rain will impact changes in Nelson Lagoon population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in Nelson Lagoon population patterns. | It is not likely that future conditions influencing high winds will impact changes in Nelson Lagoon population patterns. |
| Land Use Development | Future conditions of dense fog are not anticipated to affect future land use development in Nelson Lagoon. | Future conditions of drought are not anticipated to substantially affect future land use development in Nelson Lagoon. | Future conditions of extreme cold are not anticipated to substantially affect future land use development in Nelson Lagoon, as extreme cold is a regional hazard. | As heavy rain events affect the entire Planning Area, it is not likely that future conditions of heavy rain will impact changes in Nelson Lagoon population patterns. | It is not likely that future conditions influencing heavy snow will impact changes in Nelson Lagoon land use development. | It is not likely that future conditions of high winds will impact changes in Nelson Lagoon population patterns. |
| Subsistence Resources | Future conditions of dense fog are not anticipated to affect subsistence resources in Nelson Lagoon. | Future conditions of drought may affect subsistence resources in Nelson Lagoon, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | Future conditions of extreme cold may affect subsistence resources in Nelson Lagoon, particularly berry availability, by influencing plant growth, flowering, and seasonal productivity.<br>Some studies have been conducted to understand the relationship between changing climatic patterns and berry activity. Projections based on two IPCC Representative Carbon Pathways for 2060-2069 shore that the Aleutian | It is possible that future conditions of heavy rain will impact changes in Nelson Lagoon land use development. An increase in frequency of heavy rains could oversaturate soil on the slopes above Nelson Lagoon, leading to an increase in frequency and magnitude and severity of landslides. This could alter where new developments would be deemed safe and/or possible. Land use may also change due to development of | It is possible that future conditions influencing heavy snow will impact subsistence resources. The factors influencing changes in heavy snow – such as predicted changes in temperature and precipitation – have complex and cascading impacts in ecological systems. In the Aleutians, the maritime climate regulates the local ecology. A shift toward less winter snow could alter stream flows, | It is not likely that future conditions of high winds will impact changes in Nelson Lagoon land use development. |

| | Dense Fog | Drought | Extreme Cold | Heavy Rain | Heavy Snow | High Winds |
|---|---|---|---|---|---|---|
| | | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs may expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>Changes in the frequency or timing of drought events could alter berry harvest conditions and availability for subsistence users. Increased frequency of drought could contribute to increased wildfire risk, impacting ecosystems necessary to support subsistence species. | Meadows are at very low risk of historic and projected percent of summer days stressful for cloudberry photosynthesis. Generally, berries such as the lowbush cranberry can be sensitive to sudden changes in temperature, such as mid-winter warming events. Some berries, such as salmonberries, are found primarily near the coast where temperatures are more mild. As winter temperatures become less severe and the growing season lengthens, salmonberry shrubs ay expand their distribution northward and into higher elevation areas (UAF CASC Alaska Berry Futures).<br>While extreme cold is a regional hazard, changes in the frequency or timing of cold events could alter berry harvest conditions and availability for subsistence users. Reduced snow cover and winter precipitation in the form of snow, along with increased air temperature, are expected to increase stream water temperature (NPS 2020). During winter and spring, warmer waters could hasten development and growth of salmon eggs and fry, possibly leading to earlier life stage transitions (NPS 2020). Additionally, ecological impacts to spawning salmon from rising temperatures may be seen. During summer, warmer waters could increase physiological stress on adult salmon migrating to spawning grounds, potentially reducing spawning rates (NPS 2020). | landslide monitoring equipment and/or landslide barriers/diversion structures. | thermal stress, and nutrient availability for subsistence species. | |

**Projected Conditions for Nelson Lagoon (Niilsanam Alĝuudaa)**

In Nelson Lagoon (Niilsanam Alĝuudaa), average annual temperatures may increase by about 9°F by the end of the century.

Winter temperatures are projected to increase the most (+11°F).

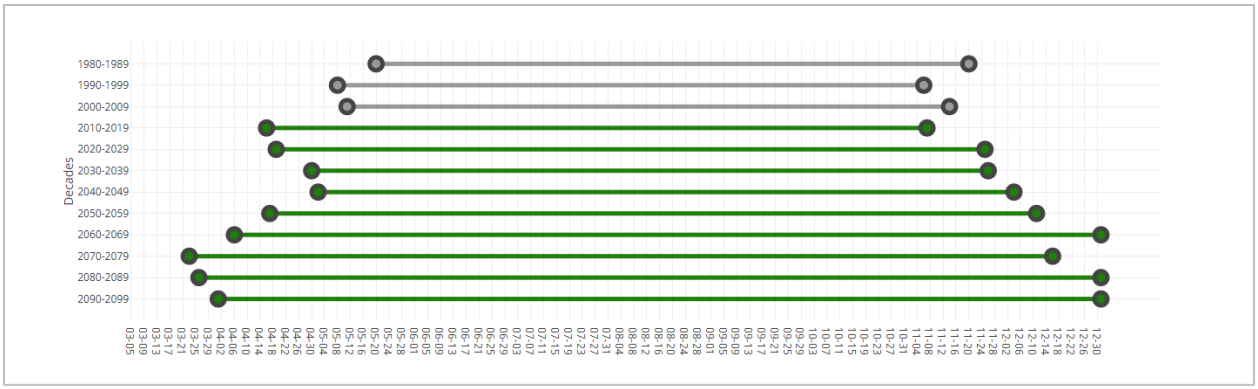
Winter may transition from below freezing to above freezing in the future.

Models have higher uncertainty with regard to precipitation, but winter is likely to have more precipitation (+24%).

In the past, this area had very low flammability. Future flammability may be about the same.

*Source: UAF/SNAP 2026- Northern Climate Reports*

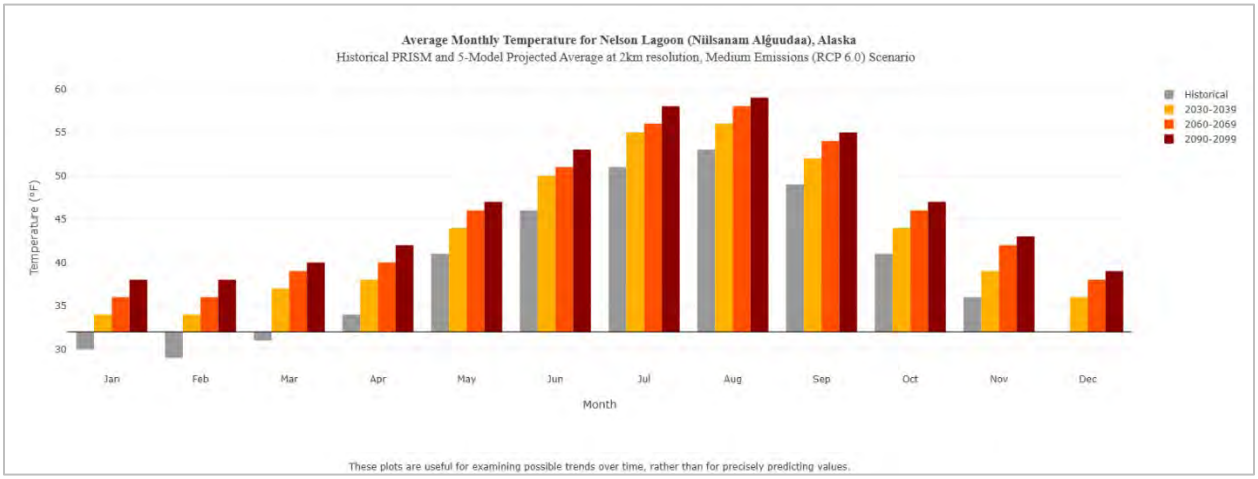
Figure N-14 models historical and future duration of the growing season in Nelson Lagoon from 1980 through 2099 (UAF/SNAP 2026). This model predicts a variance in growing season in the community by the end of the century, but an overall longer growing season as compared to historical time periods.




Source: UAF/SNAP 2026- Alaska Garden Helper

**Figure N-14- Historical and Future Projected Changes in Growing Season in Nelson Lagoon (1980-2099)**

Figure N-15 models historical and future average monthly temperatures in Nelson Lagoon from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly temperatures, with increases between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure N-15- Historical and Future Projected Average Monthly Temperature in Nelson Lagoon (1980-2099)**

Figure N-16 models historical and future average monthly precipitation in Nelson Lagoon from 1980 through 2099 (UAF/SNAP 2026). This model predicts an overall increase of average monthly precipitation, with variances of increase/decrease between each decade.




Source: UAF/SNAP 2026- Community Climate Charts

**Figure N-16- Historical and Future Projected Average Monthly Precipitation in Nelson Lagoon (1980-2099)**

### N.4.1.10 Tsunami

#### N.4.1.10.1 Location

The majority of critical facilities and infrastructure in Nelson Lagoon are vulnerable to effects from tsunamis, due to the estimated inundation zone encompassing most of the infrastructure in the community (Figure N-17).

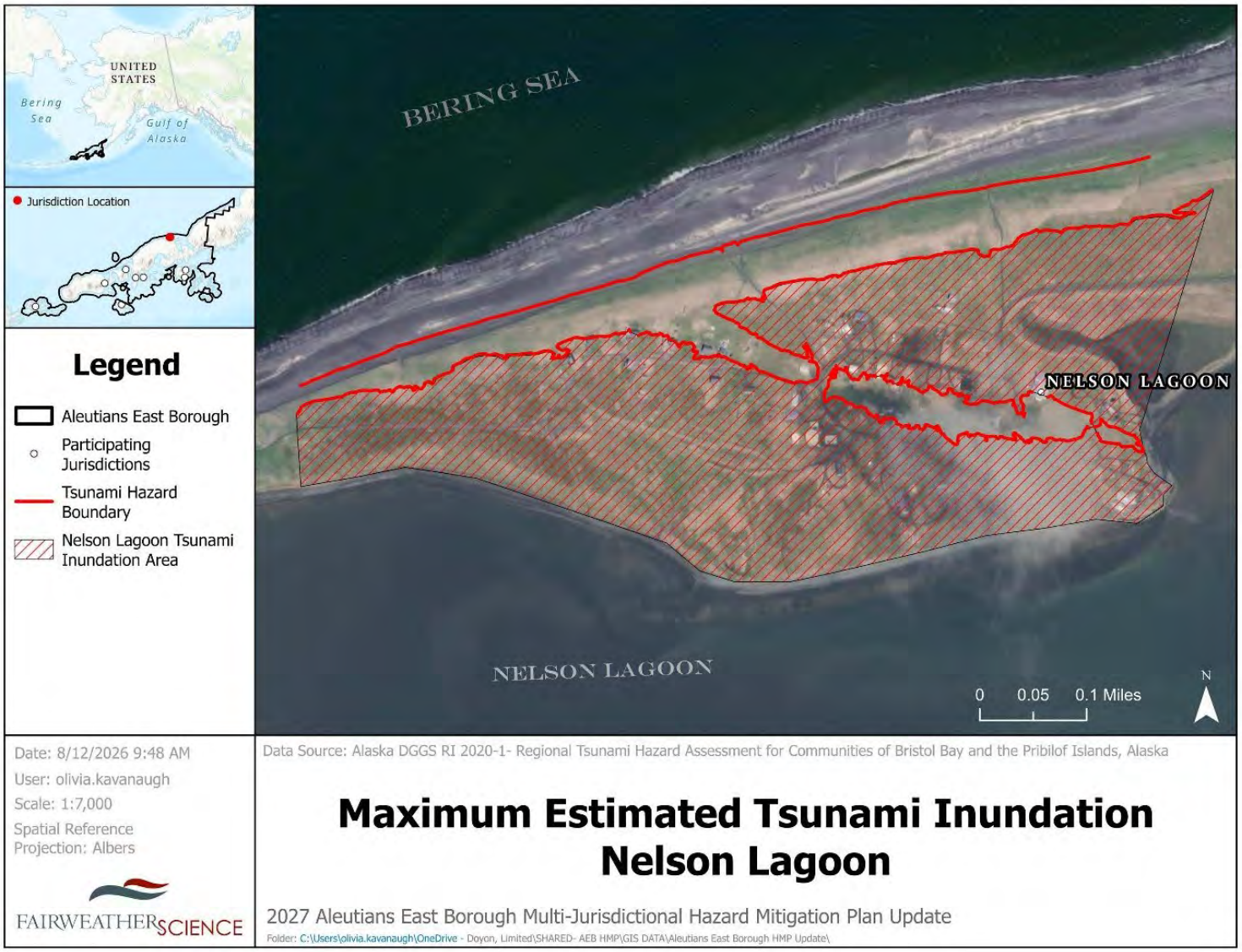



**Figure N-17 - Maximum Estimated Tsunami Inundation, Nelson Lagoon**

#### N.4.1.10.2 History

There are no recorded tsunami runups in Nelson Lagoon. However, earthquakes have resulted in tsunami evacuation warnings being issued in Nelson Lagoon (AEC 2021).

#### N.4.1.10.3 Extent (Magnitude and Severity)

Nelson Lagoon has not experienced tsunami run up events in the past. Based on Figure N-17, maximum potential inundation in Nelson Lagoon could extend up to 0.2 miles inland, and the depth of inundation could be less than one foot to over several feet.

When conducting tsunami inundation studies in 2020, Alaska DGGS stated "We assess potential tsunami hazards for the communities of Dillingham, Nelson Lagoon, and Platinum in Bristol Bay. The Bristol Bay communities have no high-resolution bathymetry or topography; therefore, we conduct tsunami hazard assessments for these areas on the regional scale. The regional approach is a suitable, cost-effective approximation and replacement for high-resolution tsunami inundation maps. The maximum assumed runup height in Nelson Lagoon is 3.5 m (11.5 ft).

Based on the extent of past tsunami events and the criteria identified in Table 5 of the Base Plan, the extent of tsunamis in Nelson Lagoon is considered **Catastrophic**, with the potential for multiple deaths, a complete shutdown of facilities and services for 30 or more days, and more than 50% of property or critical infrastructure being severely damaged.

#### N.4.1.10.4 Impact

| | Description of Impacts |
|---|---|
| Geography/Land | There have been no documented tsunami runups in Nelson Lagoon. Future tsunami runups could potentially impact low lying Nelson Lagoon, having significant impact on the shoreline. |
| Infrastructure | There are no recorded impacts from tsunamis in Nelson Lagoon. Water damage in coastal lying infrastructure is possible during a tsunami, as is damage to boat harbors, roadways, and airport runways. Critical facilities at risk of tsunami inundation include the Tide's Inn, Community Garage, US Post Office, Community Center, Cemetery West, Community Office, Building, Safety Office, Nelson Lagoon Council, VPSO housing and jail, Paul Martin Gunderson Memorial, Clinic, Clinic Housing, Water Towers 1 & 2, and the Water Tower Building. |
| People | There is no record of injuries or fatalities due to tsunamis or in Nelson Lagoon. Injuries and death are possible during a tsunami runup due to drowning, being swept into debris, or trapped during inundation. |
| Utilities | There is no record of utility disruptions due to tsunamis in Nelson Lagoon. Tsunamis can damage underground water and sewer lines, underwater cables, overhead power lines, and septic systems. |
| Transportation | There are no recorded tsunami related impacts on transportation systems in Nelson Lagoon. Future tsunamis could impact road and air travel by damaging or inundation runway surfaces and roadways. Marine travel could also be limited or delayed due to damage to boat harbors, marine vessels, or fueling stations along the coast. |
| Economy | There are no recorded economic impacts due to tsunamis in Nelson Lagoon. |
| Subsistence Resources | There are no recorded tsunami related impacts on subsistence resources in Nelson Lagoon. |

#### N.4.1.10.5 Probability of Future Events

Based on DGGS inundation mapping, and the criteria identified in Table 6 of the Base Plan, it is **Possible** that Nelson Lagoon will experience a tsunami event in the next five years; there is a 1 in 5 years chance of occurring (1/5=20%); and the history of events is greater than 10% but less than or equal to 20% likely per year.

#### N.4.1.10.6 Future Climate Conditions

| Description of Future Conditions | |
|---|---|
| Nature | The nature of tsunami events in Nelson Lagoon is not anticipated to change in the future. |
| Location | The location of tsunami events in Nelson Lagoon is not anticipated to change in the future. All low-lying coastal areas in Nelson Lagoon will remain at risk of a tsunami. |
| Extent (Magnitude/ Severity) | Future climate conditions are not anticipated to change the extent of tsunamis in Nelson Lagoon. Earthquake-induced tsunamis generated from the Aleutian Trench can be catastrophic to unnoticeable in the future. |
| Impact | Future climate conditions are not expected to change the impact of tsunamis in Nelson Lagoon. Currently there is no correlation between magnitude and frequency of earthquakes (which lead to tsunamis) and climate change. |
| Probability of Future Events | Future climate conditions are not expected to change the probability of future tsunami events in Nelson Lagoon. Earthquakes are impossible to predict; therefore, tsunamis are not possible to predict either. Current technology only allows for tsunami warning systems and forecasts after an earthquake has been detected. |
| Population Patterns | Due to the location of tsunami hazards in Nelson Lagoon, it is possible that future tsunamis will impact future population patterns. Depending on the severity of the event, a tsunami in Nelson Lagoon could displace residents located within the inundation area, which could leave some residents without viable housing options. |
| Land Use Development | Due to the location of tsunami hazards in Nelson Lagoon, it is likely that future tsunamis will impact future land use development particularly in coastal areas. If a tsunami event occurs in Nelson Lagoon, the property values in affected areas may decrease, which could increase development in areas outside of the inundation area. Additionally, land use development may change by elevating/relocating critical facilities out of the inundation area, restricting new development in the inundation area, and potential additional of tsunami sirens or another community warning system. |
| Subsistence Resources | Future climate conditions are not anticipated to influence tsunami related impacts on subsistence resources in Nelson Lagoon. |

#### N.4.1.11 Volcano

##### N.4.1.11.1 Location

The entire geography of Nelson Lagoon is vulnerable to volcanic eruptions, particularly eruptions from nearby and active Mount Pavlof.

According to the 2023 State of Alaska HMP, Nelson Lagoon is located in a **High** volcanic ash hazard level area (Figure N-18).

***Nelson Lagoon is the only community in the Aleutians East Borough located in a High volcanic ash hazard area.***

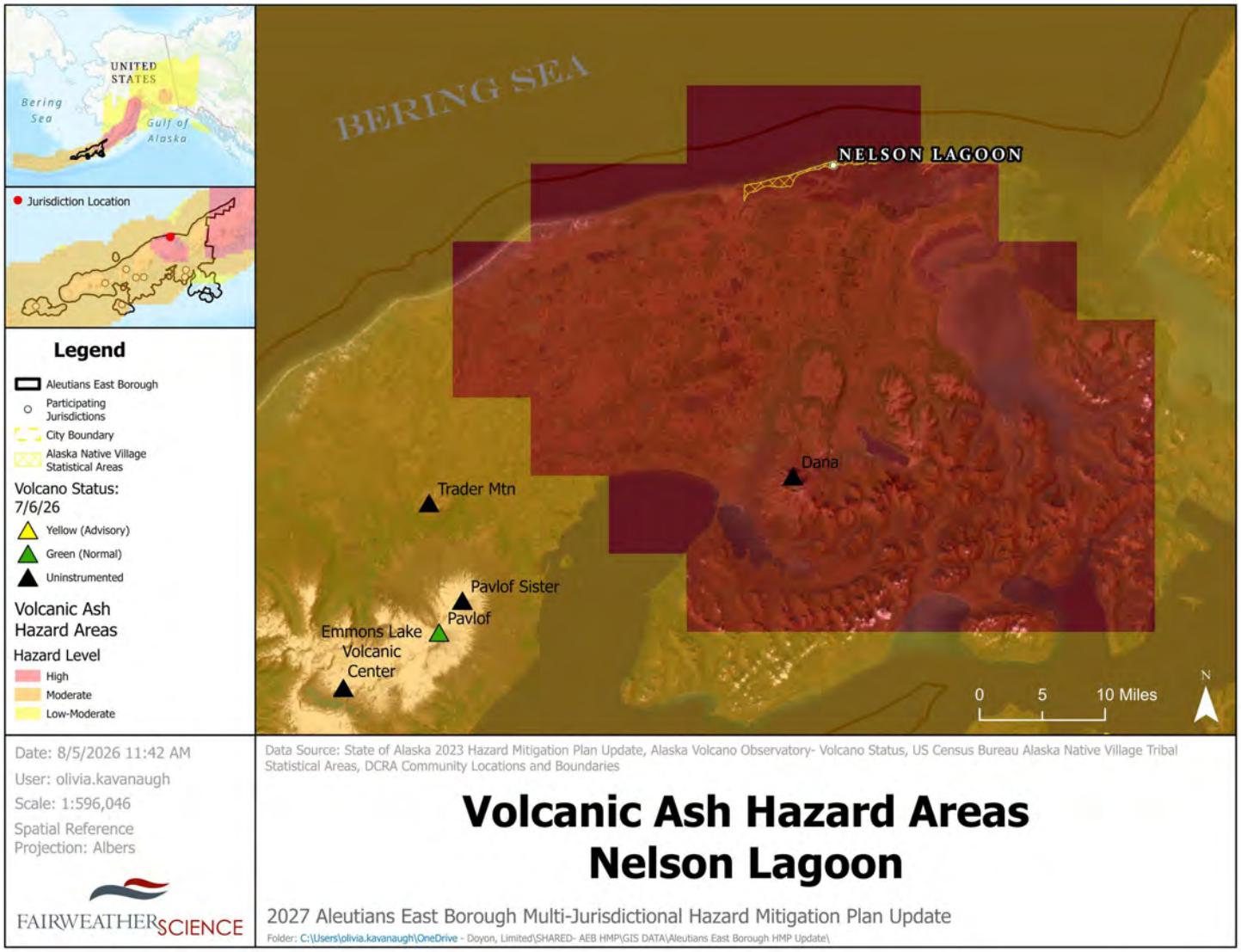



**Figure N-18 – Nelson Lagoon Volcanic Hazard Areas**

#### N.4.1.11.2 History

Nelson Lagoon has had a storied history of volcanic eruptions that have impacted the surrounding communities.

The closest active volcano to Nelson Lagoon is **Mount Pavlof**, which is approximately 48 miles southwest of the community. Pavlof has erupted a total of 31 times since 1900, with several of them resulting in localized impacts. The eruptions in 1996, 2013, and 2016 resulted in light ash fall accumulating in Nelson Lagoon. Local accounts stated that the 2016 eruption impacted the community with ash fall accumulating throughout Nelson Lagoon, with ash covering truck beds. During this eruption, air quality was affected, with several community members not able to spend unnecessary time outdoors. The Planning Team reported "thick" ashfall during this event which took time before the winds blew it away.

#### N.4.1.11.3 Extent (Magnitude and Severity)

Nelson Lagoon is located in relatively close proximity to several volcanoes that have produced large eruptions over the past century, particularly Mount Pavlof, which has averaged an eruption approximately every five years since 1900 (AVO 2026). Based on recorded eruptions and data from other surrounding volcanoes, Nelson Lagoon has been impacted by a volcanic ashfall event on approximately 5 occasions, with the majority resulting in trace to light ashfall in the community.

Based on the extent of past volcano events and the criteria identified in Table 5 of the Base Plan, the extent of volcanoes in Nelson Lagoon is considered **Critical**, with the potential for injuries and/or illnesses resulting in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property or critical infrastructure being severely damaged.

#### N.4.1.11.4 Impact

| | Description of Previous Impacts |
|---|---|
| Geography/Land | The primary impact of volcanic eruptions on the land surrounding Nelson Lagoon has been ashfall. While most of the ash deposit incorporates into the soil or is transported by wind, community clean-up is needed in certain circumstances to prevent ash inhalation from airborne deposit (USGS 2015). |
| Infrastructure | The historical ashfall reported in Nelson Lagoon has resulted in relatively minor physical damage to community infrastructure. |
| People | The Planning Team reports ashfall from a 2016 Mt. Pavlof eruption, which resulted in sheltering in place due to poor air quality. People did not go to work or drive during that time. Angela Johnson, Tribal President, reported that there were more seasonal allergy symptoms the spring after the 2016 event. |
| Utilities | There have been no documented cases of volcanic eruptions causing utility disruptions in Nelson Lagoon. While wet ash can cause power outages by coating insulators and transformers, the ashfall in the community from past eruptions have only resulted in trace amounts scattered throughout Nelson Lagoon (USGS 2015). |
| Transportation | The primary transportation related impact from a volcanic eruption in Nelson Lagoon is aircraft interruptions. Nelson Lagoon does not have a store or pharmacy, so air service is critical. There have been no recorded instances of the Nelson Lagoon airport closing due to a volcanic eruption. |
| Economy | The primary economic related impact from a volcanic eruption in Nelson Lagoon is aircraft interruptions. Flights cancelled due to volcanic ash can interrupt business operations and economic revenue from airport operations. |
| Subsistence Resources | During the 2016 Mt. Pavlof eruption, Angela Johnson, Tribal President, reports that the ashfall filled truck beds throughout the community but also contributed to a highly productive berry season. |

#### N.4.1.11.5 Probability of Future Events

The Alaska Volcano Observatory (AVO) monitors Alaska volcanoes and provides hazard information, forecasts, and notices of eruption. Alaska experiences about 2 eruptions per year, many of these having the potential to impact Nelson Lagoon.

Based on current volcanic activity trends, previous occurrences, proximity of nearby volcanoes, and the criteria identified in Table 6 of the Base Plan, it is **Highly Likely** Nelson Lagoon will experience a volcanic ashfall event within the calendar year; there is a 1 in 1 year chance of occurring (1/1=100%); and the history of events is greater than 33% likely per year.

#### N.4.1.11.6 Future Climate Conditions

| | Description of Future Conditions |
|---|---|
| Nature | Future climate conditions are not expected to influence the nature of volcanic eruptions in Nelson Lagoon. |
| Location | Future climate conditions are not expected to influence the location of volcanic eruptions in Nelson Lagoon. |
| Extent | Future climate conditions are not expected to influence the extent of volcanic eruptions in Nelson Lagoon. |
| Impact | Future climate conditions are not expected to influence the impact of volcanic eruptions in Nelson Lagoon. |
| Probability of Future Events | Future climate conditions are not expected to influence the probability of future volcanic eruptions in Nelson Lagoon. |
| Population Patterns | Future climate conditions are not expected to influence population patterns in Nelson Lagoon. |
| Land Use Development | Future climate conditions are not expected to influence land use development in Nelson Lagoon. |
| Subsistence Resources | Future climate conditions are not expected to influence Nelson Lagoon's ability to access subsistence resources. |

### N.4.1.12 Wildland Fire

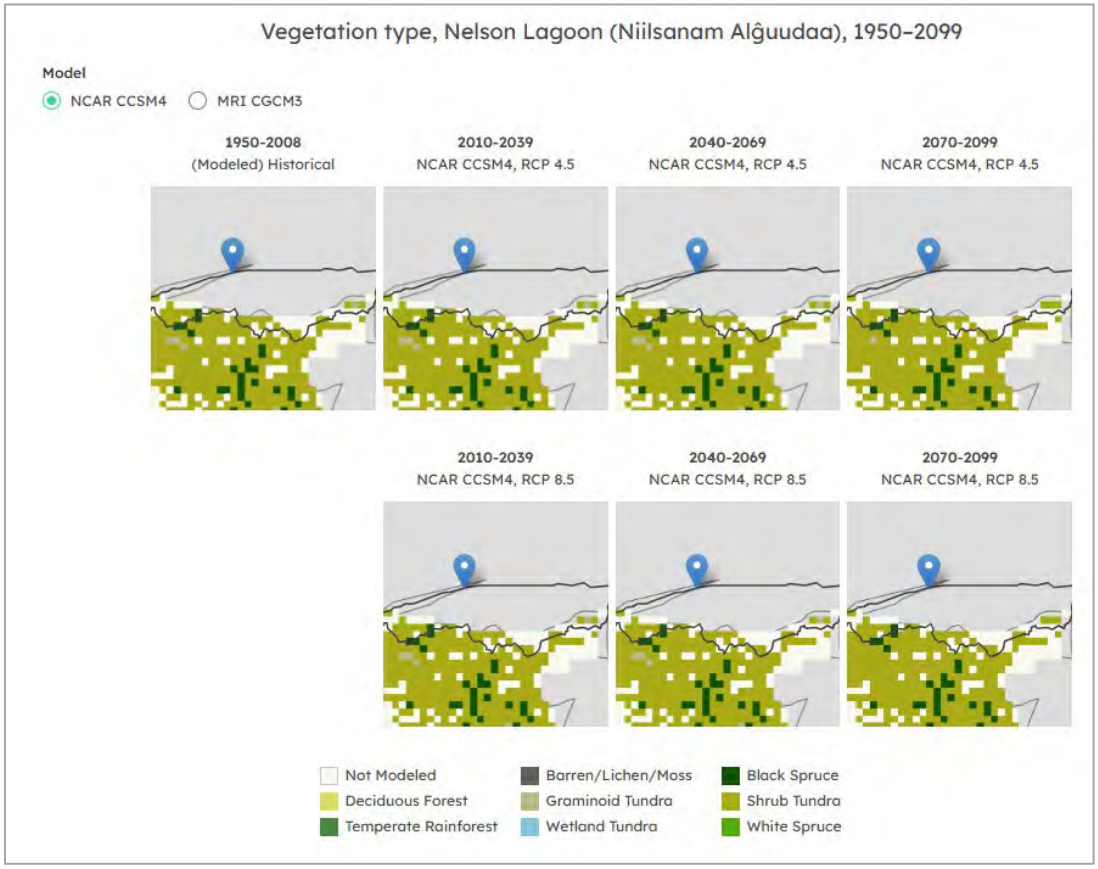
The Native Village of Nelson Lagoon Planning Team did not select this hazard to profile in the MJHMP Update.

According to LANDFIRE's (Landscape Fire and Resource Management Planning Tools Project) 2025 Alaska Statewide Wildfire Exposure Assessment, the majority of the Nelson Lagoon Planning Area is located in an area that is **Minimally Exposed to Wildfire Hazard**. The population center of Nelson Lagoon is located in an area that is Infrequently Exposed to Wildfire Hazard.




**Figure N-19- Nelson Lagoon Wildfire Exposure Risk**

Vegetation Type: In Nelson Lagoon, the predominant vegetation types are currently Shrub Tundra, Graminoid Tundra, and Black Spruce (UAF/SNAP 2026). Figure N-20 shows the projected changes in the location of vegetation in Nelson Lagoon from 1950 through year 2099.

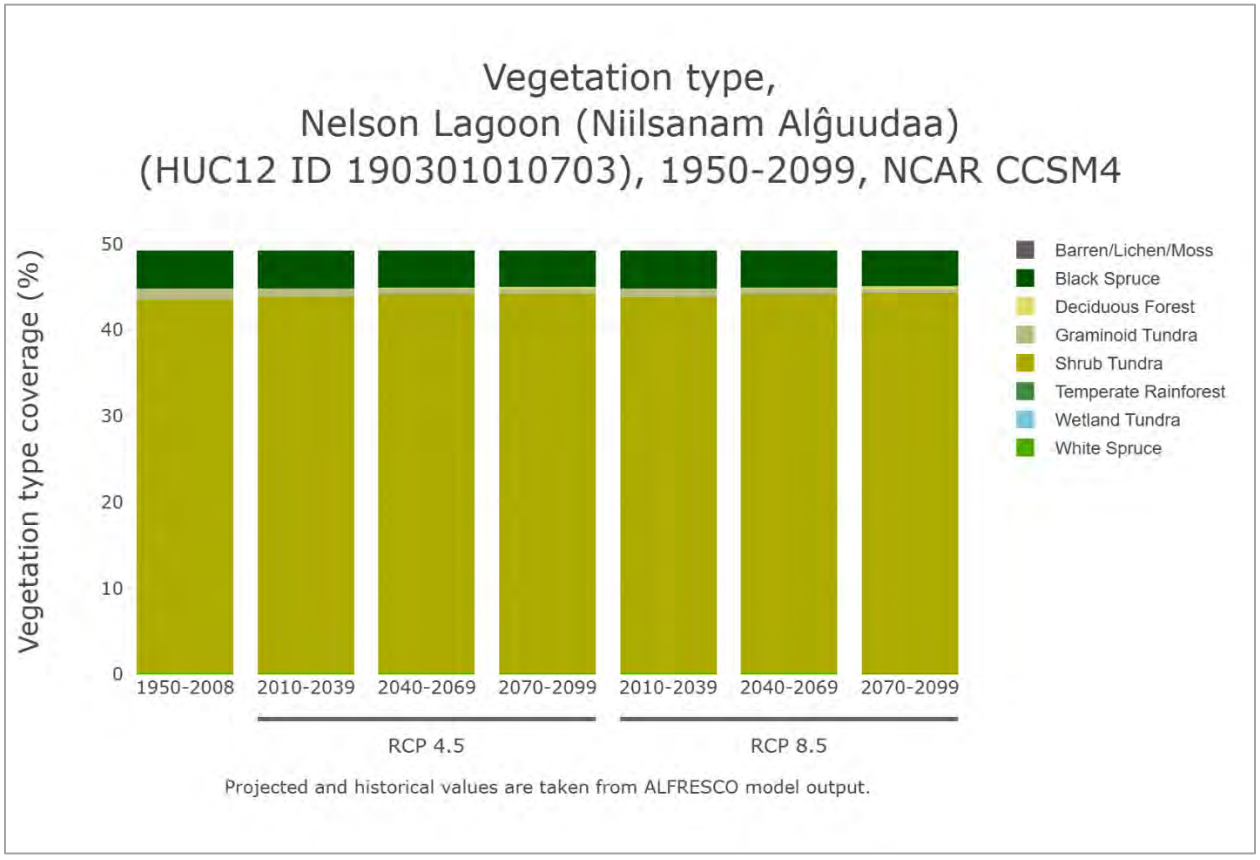



Source: UAF/SNAP 2026- Northern Climate Reports

**Figure N-20- Nelson Lagoon Vegetation Type Map (1950 - 2099)**

Figure N-21 shows historical and projected changes in vegetation type coverage in Nelson Lagoon from 1950 through year 2099.

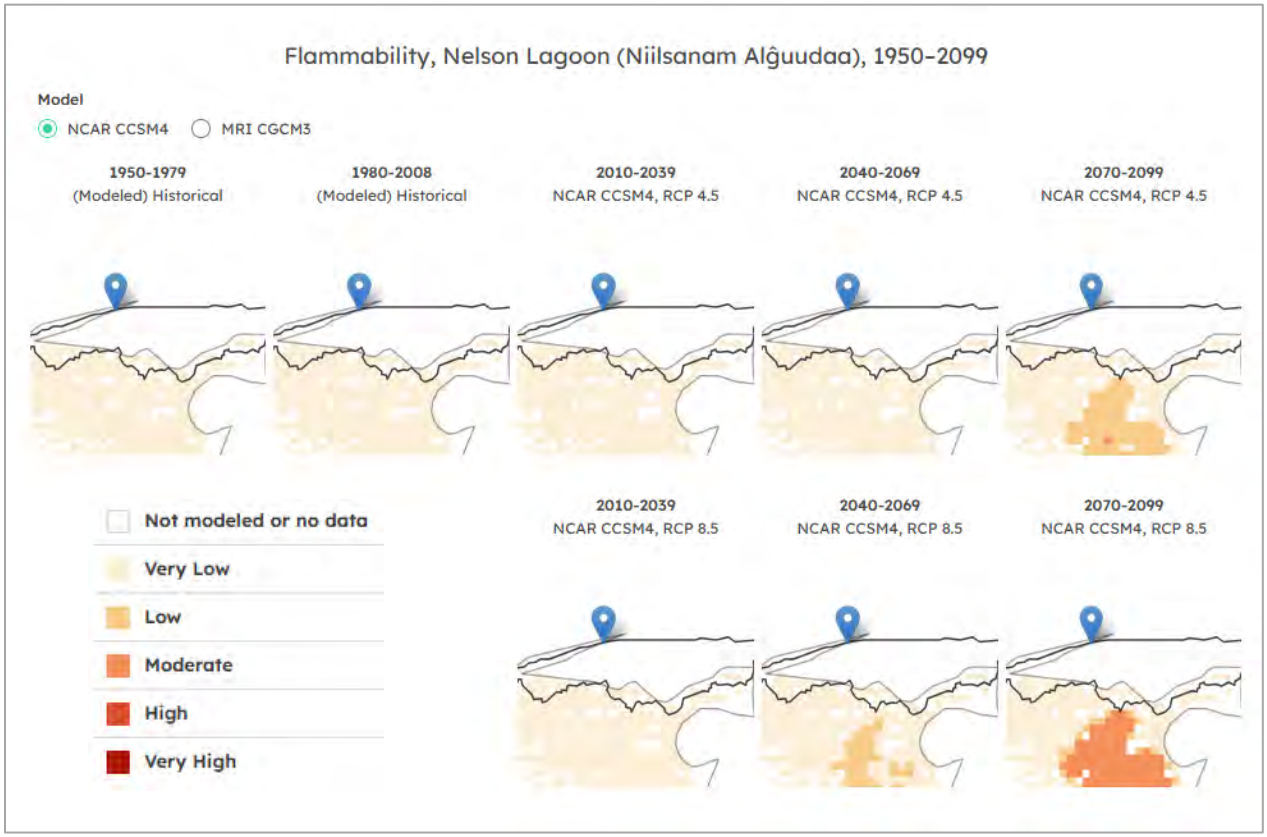
These models predict that the vegetation type in the community will stay relatively consistent through the end of the century, with a slight increase in the presence of Shrub Tundra and decrease in Graminoid Tundra type.




Source: UAF/SNAP 2026- Northern Climate Reports

**Figure N-21- Nelson Lagoon Vegetation Type Graph (1950 - 2099)**

Flammability: Historically, Nelson Lagoon has had Very Low flammability (UAF/SNAP 2026). Under the NCAR CCSM4 climate model, areas within Nelson Lagoon are expected to increase flammability to Low and Moderate through the end of the century, with higher concentrations of Moderate flammability under the RCP 8.5 (higher rate of change) climate model (Figure N-22).




Source: UAF/SNAP 2026- Northern Climate Reports

**Figure N-22- Nelson Lagoon Historical and Projected Flammability (1950 - 2099)**

## N.4.2 Critical Facilities

**Table N-1- Critical Facilities- Native Village of Nelson Lagoon**

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Native Village of Nelson Lagoon | Commercial | 20 | Coho Commercial Store | 901 N Main St | 56.00113 | -161.20748 | $1,000,000 | | | | | | x | | x | | x | | x | | | |
| 2 | Native Village of Nelson Lagoon | Commercial | 20 | Bering Inn | Storseth Rd | 56.00077 | -161.20285 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 3 | Native Village of Nelson Lagoon | Community | 0 | Cemetery East | Storseth Rd | 56.00095 | -161.20072 | $1,000,000 | | | | | | x | | x | | x | | x | | | |
| 4 | Native Village of Nelson Lagoon | Community | 0 | Community Garage | Storseth Rd | 56.00046 | -161.20171 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 5 | Native Village of Nelson Lagoon | Community | 5 | US Post Office | | 56.00014 | -161.20292 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 6 | Native Village of Nelson Lagoon | Community | 20 | Community Center | 40 S Main St | 55.9999 | -161.20645 | $1,000,000 | | | | | | x | | x | | x | x | x | | | |
| 7 | Native Village of Nelson Lagoon | Community | 0 | Cemetery West | 40 S Main St | 55.99935 | -161.20553 | $1,000,000 | | | | | | x | | x | | x | x | x | | | |
| 8 | Native Village of Nelson Lagoon | Community | 10 | Community Office/ Building | | 56.000086 | -161.202916 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 9 | Native Village of Nelson Lagoon | Community | 0 | Public Dock/Boat Ramp | | 56.004476 | -161.175574 | $20,000,000 | | | | | | x | | x | | x | | x | | | |
| 10 | Native Village of Nelson Lagoon | Education | 0 | School | 423 N Main St | 56.00112 | -161.20191 | $5,000,000 | | AEB | AEB | | | x | | x | | x | | x | | | |
| 11 | Native Village of Nelson Lagoon | Government | 5 | Safety Office | S Main St | 56.000078 | -161.202682 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 12 | Native Village of Nelson Lagoon | Government | 10 | Nelson Lagoon Council | 101 S Main St | 56.00014 | -161.2026 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 13 | Native Village of Nelson Lagoon | Government | 20 | Eastern Aleutian Tribes Housing | 423 N Main St | 56.00109 | -161.20411 | $1,000,000 | | Tribal | | | | x | | x | | x | | x | | | |
| 14 | Native Village of Nelson Lagoon | Government | 10 | VPSO/Police | | 56.000063 | -161.202747 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 15 | Native Village of Nelson Lagoon | Medical | 5 | Paul Martin Gunderson Memorial Clinic | 40 S Main St, Suite 100 | 56.000733 | -161.207711 | $5,000,000 | | | | | | x | | x | | x | x | x | | | |
| 16 | Native Village of Nelson Lagoon | Medical | 10 | Clinic Housing | | 56.00072 | -161.207475 | $500,000 | | | | | | x | | x | | x | x | x | | | |

| Facility ID | Community | Facility Type | Number of Occupants | Facilities | Address | Latitude | Longitude | Estimated Value | Building Type* | Building Owner | Land Owner | Cryosphere- Sea Ice | Cryosphere- Snow Avalanche | Earthquake | Sediment Deterioration and Land Destabilization | Flood | Ground Failure/ Landslide | Severe Weather | Tsunami | Volcano | Wildland Fire | Dam Failure | Invasive Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Native Village of Nelson Lagoon | Transportation | 0 | Airport Runway | Airport Way ~1.5miles east of Nelson Lagoon | 56.00663 | -161.16887 | $20,000,000 | (4k ft by 75 ft) gravel path | State | State | | | x | x | x | | x | | x | | | |
| 18 | Native Village of Nelson Lagoon | Transportation | 10 | DOT Airport Terminal | Airport Way ~1.5 miles east of Nelson Lagoon | 56.006487 | -161.168865 | $5,000,000 | | State | State | | | x | | x | | x | | x | | | |
| 19 | Native Village of Nelson Lagoon | Transportation | 0 | Nelson Lagoon dock | Airport Way ~ 1.14 miles east of Nelson Lagoon | 56.004446 | -161.175582 | $60,000,000 | | | | | | x | | x | | x | | x | | | |
| 20 | Native Village of Nelson Lagoon | Transportation | 5 | Harbor Building | Airport Way ~ 1.14 miles east of Nelson Lagoon | 56.0052 | -161.17592 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 21 | Native Village of Nelson Lagoon | Utilities | 0 | Fuel Farm | Airport Way ~ 1.14 miles east of Nelson Lagoon | 56.00618 | -161.17771 | $20,000,000 | | | | | | x | | x | | x | | x | | | |
| 22 | Native Village of Nelson Lagoon | Utilities | 0 | Water Tower 1 | 9998 Nelson Lagoon Dr | 56.0018 | -161.207609 | $5,000,000 | | | | | | x | | x | | x | x | x | | | |
| 23 | Native Village of Nelson Lagoon | Utilities | 0 | Water Tower 2 | 9998 Nelson Lagoon Dr | 56.00024 | -161.20721 | $5,000,000 | | | | | | x | | x | | x | x | x | | | |
| 24 | Native Village of Nelson Lagoon | Utilities | 5 | Water Tower Building | | 56.000397 | -161.207194 | $500,000 | | | | | | x | | x | | x | x | x | | | |
| 25 | Native Village of Nelson Lagoon | Utilities | 0 | Landfill | | 55.99721 | -161.23017 | $500,000 | | | | | | x | | x | | x | | x | | | |
| 26 | Native Village of Nelson Lagoon | Utilities | 0 | Water Treatment Plant (Class 2) | | 56.00023841 | -161.208436 | $50,000,000 | | | | | | x | | x | | x | x | x | | | |
| 27 | Native Village of Nelson Lagoon | Utilities | 0 | Water transfer line from village to water site | | along shoreline | along shoreline | $20,000,000 | | | | x | | x | x | x | | x | | x | | | |
| **Total Occupants:** | | | **155** | | | | **Total Estimated Value:** | **$225,500,000** | | | | | | | | | | | | | | | |




**Figure N-23- Native Village of Nelson Lagoon Critical Facilities Map 1 of 3**

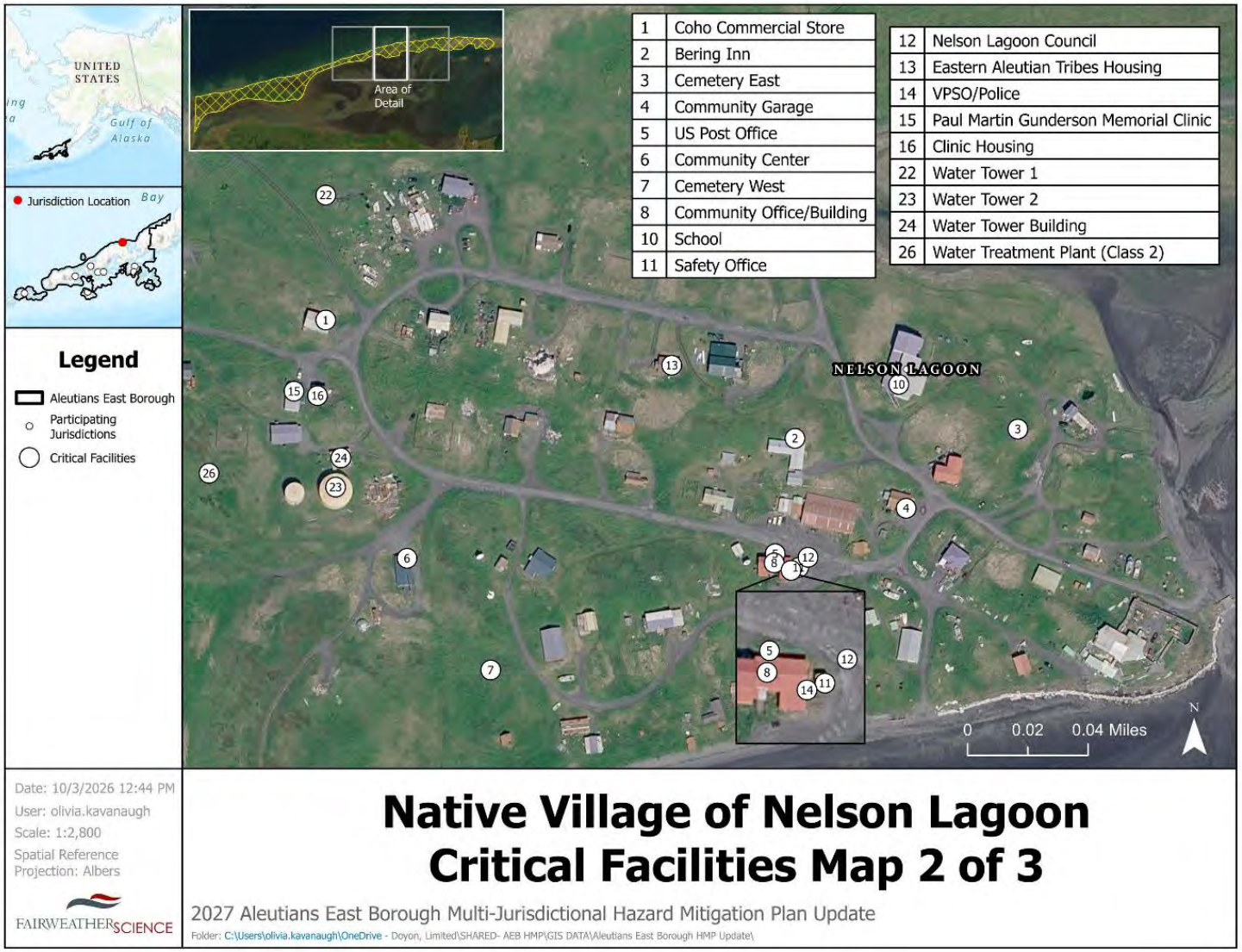



**Figure N-24- Native Village of Nelson Lagoon Critical Facilities Map 2 of 3**




**Figure N-25- Native Village of Nelson Lagoon Critical Facilities Map 3 of 3**

## N.4.3 Summary of Vulnerability

**Table N-2- Jurisdictional Summary of Vulnerability- Native Village of Nelson Lagoon**

| Hazard | # of Facilities | # of Occupants | $ of Facilities | # of Houses | # of Residents | $ of Houses |
|---|---|---|---|---|---|---|
| Cryosphere-Sea Ice | 1 | 0 | $20,000,000 | 3 | 12 | $2,174,664 |
| Cryosphere-Snow Avalanche | Did not profile this hazard | | | | | |
| Earthquake | 27 | 155 | $225,500,000 | 41 | 164 | $29,720,408 |
| Sediment Deterioration and Land Destabilization | 2 | 0 | $40,000,000 | 3 | 12 | $2,174,664 |
| Flood | 27 | 155 | $225,500,000 | 41 | 164 | $29,720,408 |
| Ground Failure/ Landslide | Did not profile this hazard | | | | | |
| Severe Weather | 27 | 155 | $225,500,000 | 41 | 164 | $29,720,408 |
| Tsunami | 14 | 80 | $71,000,000 | 37 | 148 | $26,820,856 |
| Volcano | 27 | 155 | $225,500,000 | 41 | 164 | $29,720,408 |
| Wildland Fire | Did not profile this hazard | | | | | |
| Dam Failure | Did not profile this hazard | | | | | |
| Invasive Species | Did not profile this hazard | | | | | |

Nelson Lagoon's vulnerability to natural hazards extends beyond potential damage to buildings and infrastructure. Subsistence, access to locally harvested resources, transportation, water supply, and the natural systems that help protect the community are interconnected with community well-being. Local observations demonstrate that changes in sea ice, shoreline stability, severe weather, flooding, and related environmental conditions can affect not only physical assets but also access, resource use, and the systems supporting continued community life. These consequences are not fully represented in the quantitative exposure estimates above.

## N.5 Capability Assessment

***Note: The Native Village of Nelson Lagoon does not participate in the National Flood Insurance Program (NFIP).***

| Planning and Regulatory Tools | |
|---|---|
| **Plans** | **Existing?** |
| Comprehensive/ Master Plan | No |
| Capital Improvements Plan | No |
| Economic Development Plan | No |
| Emergency Operations Plan or Small Community Emergency Operations Plan | Yes – SCERP |
| Transportation Plan | No |
| Housing Plan | No |
| Hazard-specific plans or studies | Yes |
| **Land Use Planning and Ordinances or Practices** | |
| **Ordinance/Practice** | **Existing?** |
| Zoning Ordinance | No |
| Subdivision Ordinance | No |
| Building Codes | No |
| Natural Hazard Specific Ordinance or Practices (Stormwater, Steep Slopes, Wildfire) | No |
| Acquisition of Land for Open Space and Public Recreation Uses | No |
| Maintenance Programs to Reduce Risk, E.G., Tree Trimming, Clearing Drainage Systems | Some yearly maintenance |
| Other | |
| **Administrative and Technical** | |
| **Resource** | **Existing?** |
| Tribal Council/ Governing Body | Yes, 5-member Council presently |
| Tribal Chief Executive | No |
| Mitigation Planning Committee | Yes |
| Business Committees | No |
| Mutual Aid Agreements | No |
| Code Inspector | No |
| Environmental/Natural Resources Specialist | Yes – Environmental Department with 5 staff |

| Administrative and Technical | |
|---|---|
| **Resource** | **Existing?** |
| Emergency Manager | No |
| Community Planner | Not specifically, but some staff serve in this role |
| Housing Specialist | No |
| Engineer | No |
| Historian/ Cultural Advisor | No |
| Financial or Grants Specialist | Yes – grant writer |
| Administrative Staff Person | Yes |
| Other- IGAP Coordinator | Yes |
| Warning Systems/ Services | No, not in Nelson Lagoon |
| Hazard Data/Information | Yes |
| Grant Writing | Yes, 3 people |
| Geographic Information Systems (GIS) Analysis | No |

| Financial | |
|---|---|
| **Resource** | **Existing?** |
| Capital Improvements Project Funding | Not sure |
| Gaming Revenue, Enterprise Revenues | No, although there is revenue from the fuel farm through the Corporation |
| Fees For Water, Sewer, Gas, or Electric Services | Yes |
| Fees From Festivals, Campsites, and Recreational Areas | No |
| Permits and Other Fees | No |
| Federal Funding (BIA, HUD) | Yes |
| Contract Services | Yes |

| Education and Outreach | |
|---|---|
| **Program/Organization** | **Existing?** |
| Gatherings, Festivals, Celebrations and/or Meetings | Yes – Tribal Council meetings and plenty of gatherings, celebrations, and community meetings. |
| Natural Disaster or Safety- Related School Programs | No |
| Fire Safety Programs | No |
| Culture Camp | Yes |

Nelson Lagoon residents use locally developed practices to reduce recurring hazard impacts. The Planning Team reports that residents place gravel and beach sand at vulnerable road entrances each fall to create barriers against recurring flooding. This practice represents an existing community adaptation that helps reduce access disruption during flood events.

Community response to water-system disruptions also represents an important local capability. During the 2026 water crisis, residents conserved water while local personnel worked to identify and repair the damaged water-transfer system. Continued local repair knowledge, conservation practices, and access to necessary materials are important components of water-system resilience.

# N.6 Mitigation Strategy

## N.6.1 Mitigation Goals

The Native Village of Nelson Lagoon has identified its goals related to hazard mitigation as:

1. Reduce potential sea ice vulnerability, damage, and loss.
2. Reduce potential earthquake vulnerability, damage, and loss.
3. Reduce potential flooding vulnerability, damage, and loss.
4. Reduce potential sediment deterioration, land destabilization, and shoreline loss vulnerability, damage, and loss.
5. Reduce potential severe weather vulnerability, damage, and loss.
6. Reduce potential tsunami vulnerability, damage, and loss.
7. Reduce potential volcano vulnerability, damage, and loss.

## N.6.2 Status of Mitigation Actions Identified in the 2021 AEB HMP

The Native Village of Nelson Lagoon reviewed mitigation actions identified in the 2021 AEB HMP and provided a status update for each action.

- ***Completed***- this action has been completed
- ***In Progress/Ongoing***- this action has been started is currently in-progress or ongoing
- ***Not Started***- this action has not been started

| ID | Action | Status |
|---|---|---|
| **1** | Identify buildings and facilities that must be able to remain operable during and following an earthquake event. | Not Started |
| **2** | Consider participation in the Tsunami Awareness Program. | Not Started |
| **3** | Conduct special awareness activities, such as Winter Weather Awareness Week. | Not Started |
| **4** | Update, as needed, emergency notification procedures and emergency planning for ash fall events. | Not Started |
| **5** | Evaluate water treatment plant to ensure that ashfall can't enter the system. | Not Started |
| **6** | Implement long-term erosion control project to protect waterline and other infrastructure. | Not Started |
| **7** | Relocate Nelson Lagoon water transmission line away from shoreline. | Not Started |
| **8** | Install geodetically referenced, permanent, real-time water level gauge and wave buoys. | Not Started. This was not selected as a mitigation action for this HMP Update, as the Planning Team determined that wave buoys do not survive here. A related mitigation action was added. |

## N.6.3 2027 Mitigation Action Plan

**Table N-3- 2027 Mitigation Action Plan- Native Village of Nelson Lagoon**

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | All Hazards | Make necessary upgrades to the school as an emergency shelter, including the door, the porch, the heating system, and the water system. | H | President | HMA, BIA, HUD, Denali Commission, State of Alaska | Structure and Infrastructure Projects | School | 3-4 years | B/C: Enhances safety for entire community during disasters. TF: Facility upgrades may need to be phased. | SCERP |
| **2** | All Hazards | Equip the school with generator and emergency supplies. | H | President | HMA, BIA Tribal Preparedness, DHS&EM, Tribal Homeland Security Grants | Structure and Infrastructure Projects | School | 3-4 years | B/C: Reliable shelter operation saves lives; very cost-effective. TF: Phased purchase and installation. | SCERP |
| **3** | All Hazards | Identify resources to support the incorporation of Traditional/Indigenous knowledge into hazard identification, monitoring, and interventions. | H | President | BIA Tribal Resilience Program, ANA Environmental & Cultural Grants, NOAA Tribal Climate, USGS Tribal Partnerships | Other | All | 5-10 years | B/C: Enhances culturally grounded, locally relevant mitigation outcomes. TF: Ongoing partnership development. | SCERP, Hazard-specific Studies |
| **4** | Flood | Elevate the roadway from the village to the airstrip because flooding is impacting the roadway in certain places. This is the only access to the airstrip and is crucial for emergency response. | H | President | HMA, Denali Commission, Alaska DOT, BIA Tribal Transportation, U.S. DOT | Structure and Infrastructure Projects | Airstrip, Roads | 5-10 years | B/C: Protects vital evacuation access; major benefit but potentially costly. TF: Phased funding needed for assessment, engineering, construction. | SCERP, Hazard-specific Studies |
| **5** | Sediment Deterioration and Land Destabilization | Monitor erosion, including rates and locations. | H | President | NOAA, BIA, HMA, USGS | Other | All | 5-10 years | B/C: Targeted monitoring informs effective mitigation actions. TF: Ongoing, seasonal data collection needed. | SCERP, Hazard-specific Studies |
| **6** | Sediment Deterioration and Land Destabilization | Build a sea wall on the lagoon side to protect land and critical infrastructure from erosion. | H | President | USACE, HMA, NOAA, BIA | Structure and Infrastructure Projects | All | 5-10 years | B/C: Hard structure prevents long-term land loss and protects infrastructure; this type of infrastructure can be extremely expensive. TF: Long-term design, permitting, and construction. | SCERP, Hazard-specific Studies |
| **7** | Sediment Deterioration and Land Destabilization | Fund studies and other efforts to plan for protect in place and/or managed retreat measures. | H | President | BIA, HMA, USACE, ANTHC, NOAA | Plans and Regulations | All | 3-4 years | B/C: Strategic planning prevents mis investment. TF: Scoping of planning effort needed; could be done in smaller pieces. | SCERP, Hazard-specific Studies |
| **8** | Sediment Deterioration and Land Destabilization | Identify alternative and more resilient access points to reach the water source when erosion impacts access. | H | President | BIA, HMA, USACE | Plans and Regulations | Water source, Roads | 3-4 years | B/C: Current access points are vulnerable to flood/erosion; additional access points increase resilience of a needed community resource. TF: Assessment and route development need to be phased. | SCERP, Hazard-specific Studies |

| Action ID | Hazard | Description | Priority | Responsible Dept. | Potential Funding Sources | Action Type | Associated Critical Infrastructure | Time Frame | Benefit Costs / Technical Feasibility | Other plans to include Development Action In |
|---|---|---|---|---|---|---|---|---|---|---|
| **9** | Sediment Deterioration and Land Destabilization, Cryosphere - Sea Ice | Identify long-term solution to protect the water transmission line. This could mean partial or full relocation of the water transmission line away from the shoreline. | H | President | HMA, USACE, BIA TCR, EPA Water Infrastructure Grants, Denali Commission, ANTHC | Structure and Infrastructure Projects | Water transmission line | 5-10 years | B/C: Relocation avoids repeated damage, reducing long-term costs. TF: Long-term; requires engineering and permitting. | SCERP, Hazard-specific Studies |
| **10** | Sediment Deterioration and Land Destabilization, Flood | Explore additional short-term solutions to erosion and flood threats. | H | President | BIA, HMA, Denali Commission, ANTHC, NOAA | Structure and Infrastructure Projects | All | 0-2 years | B/C: Rapid solutions reduce urgent risk potentially at a lower cost. TF: Identification of high-priority areas and effective solutions needed; phased implementation. | SCERP, Hazard-specific Studies |
| **11** | Sediment Deterioration and Land Destabilization, Flood | Explore additional long-term solutions to erosion and flood threats. | H | President | USACE, HMA, BIA, Denali Commission, ANTHC | Structure and Infrastructure Projects | All | 5-10 years | B/C: Long-term solutions avoid repeat losses and costly repairs. TF: Multi-year phasing necessary as conditions are dynamic. | SCERP, Hazard-specific Studies |
| **12** | Sediment Deterioration and Land Destabilization, Flood, Cryosphere - Sea Ice | Implement a long-term erosion control project to protect the waterline and other infrastructure. | H | President | USACE, HMA, NOAA, Denali Commission, ANTHC | Structure and Infrastructure Projects | Water line and other critical infrastructure | 5-10 years | B/C: Erosion mitigation protects critical assets and prevents costly emergency repairs. TF: Multi-year phasing to include project design and feasibility as well as implementation with staged construction. | SCERP, Hazard-specific Studies |
| **13** | Sediment Deterioration and Land Destabilization, Flood, Cryosphere - Sea Ice | Increase the capacity for holding water in the community, likely by adding another water tank. | H | President | EPA Drinking Water SRF, FEMA HMA, USDA, ANTHC | Structure and Infrastructure Projects | Water tank | 0-2 years | B/C: Additional storage provides resilience during droughts or infrastructure failures. TF: Phasing needed for tank selection, procurement and installation. | SCERP, Hazard-specific Studies |
| **14** | Sediment Deterioration and Land Destabilization, Flood, Cryosphere - Sea Ice | Rebury section of water transmission line exposed in winter 2026 and relocate this. | H | President | HMA, USACE, EPA, ANTHC | Structure and Infrastructure Projects | Water line | 0-2 years | B/C: Reduces freeze, erosion, and breakage risk. TF: Timing constrained by construction seasons/weather. | SCERP, Hazard-specific Studies |
| **15** | Severe Weather | Continue to improve the reliability of the energy system, such as upgrading the old transformers. | H | President | DOE Tribal Grid Resilience Grants, BIA Tribal Energy Development Grants, Denali Commission, HMA | Structure and Infrastructure Projects | Energy infrastructure | 5-10 years | B/C: Reduces outages and costly emergency repairs. TF: Consider phased actions in coordination with other projects. | SCERP, Hazard-specific Studies |
| **16** | Severe Weather | Identify strategies to protect critical utilities (such as water) during extreme cold weather events. | H | President | HMA, BIA, EPA, ANTHC | Structure and Infrastructure Projects | All | 3-4 years | B/C: Prevents freeze-related failures; very cost-effective. TF: Phased assessment and implementation. | SCERP, Hazard-specific Studies |
| **17** | Tsunami | Secure funding to complete high resolution elevation data, which can be used to predict accurate tsunami inundation depths and to inform other hazard assessments. | H | President | USGS, HMA, NOAA, DHS&EM | Other | All | 5-10 years | B/C: High-quality data improves tsunami + flood modeling. TF: Field seasons constrained by funding availability and weather. | SCERP, Hazard-specific Studies |
| **18** | Volcano | Evaluate water treatment plant to ensure that ashfall can't enter the system. | H | President | Tribe, EPA, FEMA HMA, USGS Volcano Hazards | Structure and Infrastructure Projects | Water treatment plant | 5-10 years | B/C: Prevents contamination; avoids expensive shutdowns. TF: Potential to implement low-cost improvements. Phasing needed for assessment and implementation. | SCERP, Hazard-specific Studies |

### N.6.3.1 Projects Considered but Not Selected for Inclusion in the 2027 Mitigation Action Plan

The following projects were reviewed by the Planning Team but were not selected for inclusion in the 2027 Mitigation Action Plan.

| Proposed Project | Reason for Not Selecting |
|---|---|
| Install geodetically referenced, permanent, real time water level gauge and wave buoys. | Wave buoys don't survive here. We have a water level gauge but it was damaged this summer – a project was selected to repair this and ensure it is strong enough to withstand environmental conditions. |
| Conduct special awareness activities, such as Winter Weather Awareness Week. | This is not a priority and is not selected for this HMP Update. |

# N.7 Plan Update

## N.7.1 Changes in Development, including in Hazard-Prone Areas (Current and Future)

### N.7.1.1 Changes in Development Since 2021

No changes in development since 2021 were reported in Nelson Lagoon.

### N.7.1.2 Future/Planned Development

The Planning Team reported that protection of drinking water infrastructure is a high priority as well as increasing capacity for holding water.

## N.7.2 Changes in Priorities and Mitigation Efforts

Little progress was made on the specific mitigation actions identified in the last planning effort. The planning team is focused on protecting infrastructure from erosion and land destabilization with particular focus on water infrastructure.

# N.8 Plan Maintenance

## N.8.1 Planning Team MJHMP Maintenance Commitment

The Native Village of Nelson Lagoon is responsible for monitoring, evaluating, and updating the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan in accordance with 44 CFR §201.7.

The Native Village of Nelson Lagoon is committed to annually reviewing the Plan and Tribal staff will work to complete their review responsibilities.

## N.8.2 Continued Public Involvement

The Native Village of Nelson Lagoon is dedicated to continued public involvement over the next five years.

The Native Village of Nelson Lagoon will continue public involvement by publishing a survey on their website and social media (like the survey used in this MJHMP Update), prior to the annual review and after a significant hazard event. This survey will ask the public for details of the event (how fast did the wind blow, total snowfall, how deep were flood waters, etc.), including how they were impacted, and suggestions for future mitigation activities. This will help in streamlining the Plan update in 2032.

Future engagement should also provide opportunities for Tribal citizens and other community knowledge holders to identify new local observations, environmental changes, subsistence-related impacts, traditional access concerns, and other knowledge relevant to hazard mitigation planning. Engagement should not rely exclusively on a single written question or survey prompt, since relevant knowledge may emerge through hazard-specific discussions and other forms of community participation. Where Indigenous Knowledge or other community-provided information is considered for incorporation into the MJHMP, appropriate attention should be given to Tribal review, attribution, sensitivity, and preferences regarding public disclosure.

## N.8.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP

The Native Village of Nelson Lagoon jurisdictional Planning Team will complete an annual review of the HMP utilizing the Annual Review Checklist in Appendix E- Annual Plan Review Checklist. The intent of the annual review is for the Planning Team to monitor, track, and evaluate all elements of the plan, including those specified below, and update them as required.

**The Tribal Administrator will be responsible for coordinating and facilitating the annual review each year.**

#### N.8.3.1.1 Implementing

Upon adoption of the Plan, The Native Village of Nelson Lagoon will reference the 2027 MJHMP in future land use planning, capital improvement planning, grant applications, emergency management activities, and other relevant planning and development decisions. The Borough will use the Plan to help identify opportunities to incorporate hazard mitigation into future projects, policies, and programs.

#### N.8.3.1.2 Monitoring

The Native Village of Nelson Lagoon will monitor the progress of mitigation actions on an annual basis. The Tribal Administrator will work with responsible departments, agencies, and partners to document the status of each action, including accomplishments, challenges, and any changes to implementation schedules or responsibilities.

#### N.8.3.1.3 Evaluating

The Native Village of Nelson Lagoon will evaluate the effectiveness of the Hazard Mitigation Plan annually by reviewing progress on mitigation actions, changes in hazard risks and community conditions, and whether actions continue to address identified vulnerabilities. The results of this review will be used to determine whether mitigation actions or priorities need to be modified.

Annual reviews should also consider whether new Indigenous Knowledge, local observations, environmental changes, or community priorities warrant updates to hazard, vulnerability, capability, or mitigation information.

#### N.8.3.1.4 Updating

The Native Village of Nelson Lagoon will conduct a comprehensive update of the Hazard Mitigation Plan at least once every five years, in accordance with 44 CFR § 201.7. The plan coordinator, in coordination with participating departments, agencies, and stakeholders, will incorporate the results of monitoring and evaluation, updated hazard and risk information, changes in community conditions, and progress on mitigation actions into the updated plan.

Future plan updates should provide opportunities for the Native Village of Nelson Lagoon to identify local knowledge, subsistence practices, resource-sharing relationships, and other community-based systems that contribute to hazard preparedness and resilience, while allowing the Tribe to determine what information is appropriate for inclusion in the public plan.

Figure N-26 provides a visual of the HMP plan maintenance activities per year.

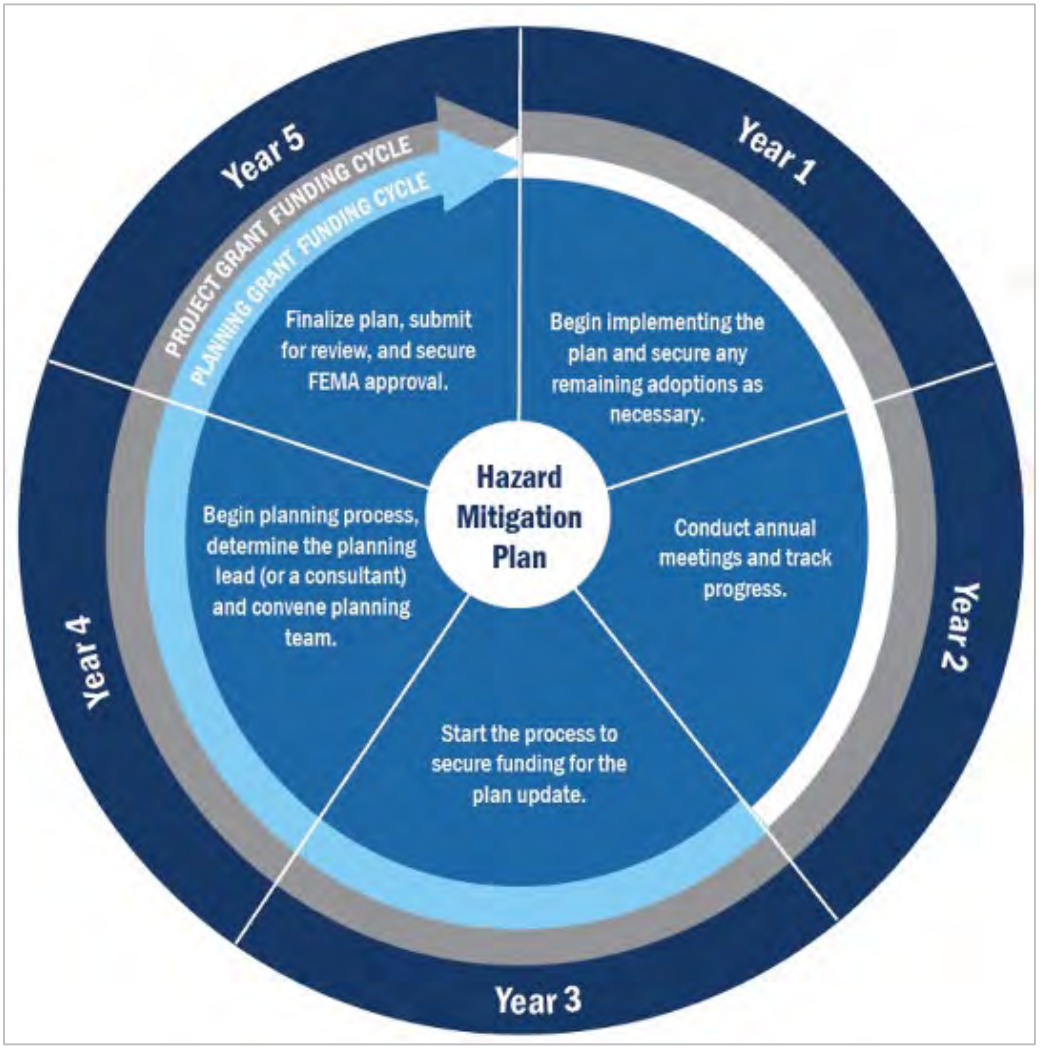



**Figure N-26- HMP Update Schedule**

## N.8.4 Plan Integration

The Native Village of Nelson Lagoon will integrate the information, recommendations, and mitigation actions identified in the 2027 MJHMP into other Tribal planning and implementation processes, when appropriate, including other FEMA programs and initiatives.

The Tribe will review relevant planning documents and projects during their normal update or development cycles and identify opportunities to incorporate hazard mitigation priorities, risk information, and mitigation actions.

Planning mechanisms that may incorporate information from the 2027 MJHMP include the Tribe's comprehensive and land use planning processes, economic development planning, capital improvement planning, emergency management planning, infrastructure planning, community development activities, and grant-funded projects as well as the upcoming APIA Regional Adaptation Plan.

As the plan is implemented, The Native Village of Nelson Lagoon will identify applicable mitigation actions for incorporation into these mechanisms and coordinate with the departments, agencies, and organizations responsible for their development and implementation. Progress toward integration will be reviewed during the annual mitigation plan monitoring process.

# N.9 Plan Adoption

The Nelson Lagoon Tribal Council formally adopted the 2027 Aleutians East Borough Multi-Jurisdictional Hazard Mitigation Plan Update on DATE.

## N.9.1 Tribal Assurances

The Native Village of Nelson Lagoon assures that the Tribal Planning Team and Tribal Council will comply with applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding (including 2 CFR Parts 200 and 3002) and will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes.

[insert signed adoption resolution]

Agenda Statement

Date: October 14, 2026

To: Mayor Osterback and Assembly

From: Anne Bailey, Borough Administrator

**Re: Resolution 27-28, Authorizing the Mayor to negotiate and execute an agreement with LONG Building Technologies for the Sand Point Boiler and Miscellaneous Mechanical Services, Maintenance, and Repair in an amount not to exceed $350,375**

On September 8, 2026, the Borough issued a Request for Proposals for Boiler and Miscellaneous Services, Maintenance, and Repairs in Sand Point. The scope of work includes annual maintenance or hydronic and other mechanical systems at the Sand Point School, Sand Point Office and the 4-Plex. It also includes replacing the De Dietrich and Weil McLain boilers at the school and the Vaillant boilers at the office. The proposals were originally due on September 29, 2026.

Due to inquiries by contractors, Addendum No. 1 was issued on September 29, 2026 extending the deadline to October 6, 2026. Due to further inquiries, Addendum No. 2 was issued on October 5, 2026 extending the proposal deadline to October 8, 2026 and replaced the schedule, which is now reflected as follows:

**PROCUREMENT**

- September 8, 2026 RFP Advertised
- September 14, 2026 Deadline for Questions
- October 8, 2026 Proposals Due
- October 8, 2026 AEB Assembly Meeting
- ~October 15, 2026 AEB Special Assembly Meeting

**CONSTRUCTION**

- Mid-October, 2026 Contractor Award/NTP
- October/November 2026 Annual Maintenance Repairs and Boiler Replacement Procurement
- November/December 2026 Annual Maintenance Completion/Boiler Replacement Procurement
- Spring 2027 Boiler Replacements

By the October 8, 2026 deadline, two proposals were submitted. The selection committee reviewed and LONG Building Technologies was selected for the work in the amount of $350,375.

If approved, the Borough will pay for the Sand Point Boiler Work out of the Deferred Maintenance account (line item 21-502-8025).

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RECOMMENDATION:
Administration recommends the approval of Resolution 27-28 authorizing the Mayor to negotiate and execute an agreement with LONG Building Technologies for the Sand Point Boiler and Miscellaneous Mechanical Services, Maintenance, and Repair in an amount not to exceed $350,375.

**RESOLUTION 27-28**

**A RESOLUTION OF THE ALEUTIANS EAST BOROUGH ASSEMBLY AUTHORIZING THE MAYOR TO NEGOTIATE AND EXECUTE AN AGREEMENT WITH LONG BUILDING TECHNOLOGIES FOR THE SAND POINT BOILER AND MISCELLANEOUS MECHANICAL SERVICES, MAINTENANCE, AND REPAIR IN AN AMOUNT NOT TO EXCEED $350,375**

**WHEREAS**, on September 8, 2026, the Borough issued a Request for Proposal (RFP) for Boiler and Miscellaneous Services, Maintenance, and Repairs in Sand Point; and

**WHEREAS**, the scope of work includes annual maintenance or hydronic and other mechanical systems at the Sand Point School, Sand Point Borough Office and the 4-Plex and boiler replacement at the school and office; and

**WHEREAS**, the proposals were originally due on September 29, 2026; however, Addendum No. 1 was issued on September 29, 2026 extending the deadline to October 6, 2026; and

**WHEREAS,** Addendum No. 2 was issued on October 5, 2026 extending the proposal deadline to October 8, 2026 and changing the schedule in the RFP; and

**WHEREAS**, two proposals were received by the October 8, 2026 deadline; and

**WHEREAS,** a selection committee reviewed and selected LONG Building Technologies for the work in the amount of $350,375; and

**WHEREAS,** the Borough would pay for the Sand Point Boiler work out of the Deferred Maintenance account (21-502-8025).

**NOW THEREFORE, BE IT RESOLVED**, the Aleutians East Borough Assembly authorizes the Mayor to negotiate and execute an agreement with LONG Building Technologies for the Sand Point Boiler and Miscellaneous Mechanical Services, Maintenance, and Repair in an amount not to exceed $350,375

**PASSED AND ADOPTED** by the Aleutians East Borough on this 16th day of October 2026.

_____
Alvin D. Osterback, Mayor

ATTEST:

_____
Beverly Rosete, Clerk

# NEXT MEETING DATE, TIME AND PLACE

# ADJOURNMENT