Native Village and City of Wales
2024 Multi-Jurisdictional Hazard Mitigation Plan

Tribal Adoption: XX

City Adoption: XX

Dates Active: XX, 2024 - XX, 2029

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This document was prepared under a grant from the Bureau of Indian Affairs to Kawerak, Inc., and managed by the Emergency Preparedness Department of Kawerak, Inc.

Front Cover Photo Acknowledgments:

Buzard et al. (2021)- Erosion Exposure Assessment- Wales

TABLE OF CONTENTS

EXECUTIVE SUMMARY **1**
Community Profile 2
Vulnerability Snapshot 8
Critical Facilities and Infrastructure in Wales 9
Mitigation Action Plan (MAP) 12
FEMA APPROVAL LETTER **19**
PLAN DISTRIBUTION LIST **20**
RECORD OF CHANGES **20**
1. PLAN INTRODUCTION AND BACKGROUND **21**
1.1 Purpose 21
1.2 Multi-Jurisdictional Hazard Mitigation Plan Layout Description 21
2. PLANNING PROCESS **23**
2.1 Overview 24
2.2 Hazard Mitigation Planning Team 26
2.3 Opportunities for Collaborators and Other Interested Parties to Participate 27
2.4 Public Involvement and Tribal Definition of Membership 29
2.5 Review and Incorporation of Existing Plans, Studies, and Reports 30
2.6 Other Ongoing Tribal Efforts 31
3. RISK ASSESSMENT/HAZARD ANALYSIS **32**
3.1 Overview 32
3.2 Hazard Identification and Screening 33
3.2.1 Hazards Not Profiled in this MJHMP 34
3.3 Hazard Profiles 35
3.3.0 Climate Change 36
3.3.1 Earthquake 38
3.3.2 Severe Weather 48
3.3.3 Wildland/Tundra Fire 74
3.3.4 Changes in the Cryosphere 84
3.3.5 Naturally Occurring Uranium 98
3.3.6 Flood 101
3.3.7 Tsunami 115
3.3.8 Erosion 122
3.3.9 Landslide 130
3.4 Summary of Vulnerability 133
3.4.1 Overview 134
3.4.2 Cultural and Sacred Site Sensitivity 135

3.4.3 Population and Building Stock ... 135
3.4.4 Vulnerability Assessment Methodology ... 136
3.4.5 Data Limitations ... 136
3.4.6 Asset Inventory ... 137
3.4.7 Vulnerability Exposure Analysis ... 142
3.4.8 Land Use in Wales ... 143
3.4.9 Future Development ... 148
3.4.10 Subsistence and Food Sovereignty in Rural Alaska ... 150

4. MITIGATION STRATEGY ... 151

4.1 Capability Assessment ... 152
4.1.1 Ability to Expand and Improve Resources ... 156
4.2 NFIP Participation and Repetitive Loss ... 156
4.3 Mitigation Goals ... 156
4.4 Mitigation Actions ... 157
4.5 Evaluating and Prioritizing Mitigation Actions ... 158
4.6 Mitigation Action Plan (MAP) ... 159
4.7 Monitoring and Reviewing Mitigation Actions ... 167

5. PLAN MAINTENANCE ... 168

5.1 Planning Team MJHMP Maintenance Commitment ... 168
5.2 Continued Public Involvement ... 169
5.3 Implementing, Monitoring, Evaluating, and Updating the MJHMP ... 169
5.4 Plan Integration ... 172

6. PLAN UPDATE ... 173

6.1 Changes in Development in Hazard-Prone Areas ... 173
6.2 Changes in Priorities in Mitigation Efforts ... 173

7. PLAN ADOPTION ... 174

7.1 Tribal Assurances ... 174
7.2 Formal Adoption ... 174

8. REFERENCES ... 175

9. APPENDICES ... 180

Appendix A – Federal Funding Resources for Mitigation Projects ... 180
Appendix B – FEMA Review Tool, Tribal and Local Hazard Mitigation Plans ... 183
Appendix C – Adoption Resolutions ... 184
Appendix D – Public Outreach Activities ... 185

LIST OF FIGURES

Figure 1- Wales Location Map ... 2
Figure 2- Arctic Arc Sculpture in Wales ... 2
Figure 3- Historical Population of Wales ... 7
Figure 4- Statewide Volcanic Ash Hazard Areas ... 34
Figure 5- Annual Relative Sea Level in Nome and Future Projections (1960-2100) ... 37
Figure 6- How Climate Change is Affecting the Timing of Traditional Subsistence Activities ... 38
Figure 7- Types of Seismic Waves ... 39
Figure 8- Historical Alaska Earthquakes Greater than M5.5, 1900 - February 6, 2024 ... 42
Figure 9- Map of Alaska's Recorded Earthquakes in 2023 ... 43
Figure 10- Historical Earthquakes M4.0 and Greater near Wales ... 44
Figure 11- Alaska's Faults and Folds ... 45
Figure 12- Faults and Folds Near Wales ... 46
Figure 13- Wales Earthquake Probability/Risk ... 47
Figure 14- Alaska Average Annual Temperature 1991-2020 ... 52
Figure 15- Alaska Average Annual Precipitation 1991-2020 ... 53
Figure 16- Historical Drought Monitor Conditions for Alaska (2000-January 2024) ... 54
Figure 17- Historical Drought Monitor Conditions for Nome Census Area (2000-January 2024) ... 55
Figure 18- Deep Snow Buries Boat in Wales ... 62
Figure 19- Snow Drift at the Native Store ... 62
Figure 20- Snow Drift in Wales ... 63
Figure 21- Annual Wind Speed/Direction Distribution in Wales, 2010-Present ... 64
Figure 22- Alaska's Predicted Temperature Changes Through 2099 ... 68
Figure 23- Percent Change in Annual Average Precipitation Statewide (1973-2022) ... 69
Figure 24- Historical and Projected Temperatures for Wales ... 70
Figure 25- Historical and Projected Precipitation Amounts for Wales ... 70
Figure 26- Historical and Projected Length of Growing Season in Wales ... 73
Figure 27- Historical Wildfire Perimeters near Wales (1940-2023) ... 78
Figure 28- Vegetation/Landcover Class and Ecoregions of Alaska ... 79
Figure 29- Statewide Wildfire Hazard Areas ... 81
Figure 30- Historical and Projected Changes in Vegetation Type Coverage in Wales ... 82
Figure 31- Projected Changes in Vegetation in Wales ... 82
Figure 32- Historical and Projected Flammability Conditions for Wales (1950-2099) ... 83
Figure 33- Components of the Cryosphere ... 84
Figure 34- Permafrost Characteristics of Alaska ... 85
Figure 35- Statewide Permafrost Hazard Areas ... 86
Figure 36- Wales Permafrost Profile/Risk ... 87
Figure 37- Mean Annual Ground Temperature in Wales (1995-2100) ... 89
Figure 38- Age of Arctic Sea Ice in 1985 vs. 2021 ... 90
Figure 39- Age of Arctic Sea Ice on March 28, 2024 ... 90
Figure 40- Historical Sea Ice Concentration in Wales (1850-2021) ... 91

Figure 41- Bering Sea Ice Extent 2013-2018 92
Figure 42- Bering Sea Average February Sea Ice Extent (1979-2022) 92
Figure 43- Path of an Avalanche 95
Figure 44- Statewide Avalanche Hazard Areas 96
Figure 45- Location of Cape and Razorback Mountain in Proximity to the Village 96
Figure 46- Location of Cape Mountain in Proximity to the Village 97
Figure 47- Alaska DEC Drinking Water Protection Area (Wales) 100
Figure 48- Statewide Coastal Flooding Hazard Areas 104
Figure 49- Location and Extent of Flooding at Village Creek 105
Figure 50- Historical Water Level of Village Creek (1909) 105
Figure 51- Wales Color-Indexed Elevation Ranges 106
Figure 52- Wales Color-Indexed Elevation Map (1 of 4) 107
Figure 53- Wales Color-Indexed Elevation Map (2 of 4) 108
Figure 54- Wales Color-Indexed Elevation Map (3 of 4) 109
Figure 55- Wales Color-Indexed Elevation Map (4 of 4) 110
Figure 56- Storm Surge in Wales (November 9, 2011) 111
Figure 57- Statewide Flooding Threat Risk Map 112
Figure 58- Estimated 50-year Surge Level in Wales 114
Figure 59- Cross Section of a Tsunami Propagation 116
Figure 60- National Tsunami Risk Map 119
Figure 61- Bathymetry of Norton Sound 120
Figure 62- Bathymetry of the Eastern Channel of the Bering Strait 121
Figure 63- Distinguishing Between Coastal Erosion and Scour 123
Figure 64- Linear Extent of Erosion in Wales (2007) 125
Figure 65- Shoreline Change in Wales (1950-2012) 125
Figure 66- Statewide Erosion Threat Risk Map 127
Figure 67- Erosion Damage to the Road to Tin City Due to Typhoon Merbok (September 2022) 128
Figure 68- Statewide Coastal Erosion Hazard Areas 129
Figure 69- Landslide Hazard Areas in Alaska 132
Figure 70- Razorback Mountain in Wales 132
Figure 71- Statewide Combined Threat Risk Map 135
Figure 72- Map of Critical Facilities in Wales 141
Figure 73- Wales Community Map (2004) (1 of 3) 144
Figure 74- Wales Community Map (2004) (2 of 3) 145
Figure 75- Wales Community Map (2004) (3 of 3) 146
Figure 76- Wales Area Map (2004) 147
Figure 77- Contractor Supplies Left in Wales 167
Figure 78- Contractor Supplies Left in Wales 167
Figure 79- HMP Update Schedule 170

LIST OF TABLES

Table 1- Average Weather Data for Tin City (2015-2023) ... 3
Table 2- Hazard Mitigation Planning Team Meetings ... 25
Table 3- Hazard Mitigation Planning Team ... 26
Table 4- Documents Reviewed ... 30
Table 5- Identification and Screening of Hazards ... 33
Table 6- Hazard Magnitude/Severity Criteria ... 35
Table 7- Hazard Probability of Future Events Criteria ... 35
Table 8- Magnitude/Intensity/Ground-Shaking Comparisons ... 40
Table 9- Historical Earthquakes (M4.0 and greater within 100 miles of Wales) ... 41
Table 10- Beaufort Scale of Wind Strength ... 49
Table 11- Saffir-Simpson Hurricane Wind Scale ... 50
Table 12- Classifications of Drought Conditions ... 51
Table 13- Historical Severe Weather Events in Wales ... 55
Table 14- Historical Wildfires within 100 miles of Wales (1939-2023) ... 76
Table 15- Top 10 Storm Surge Events in Wales from 1954-2004 ... 102
Table 16- Historic Flood Events in Wales ... 103
Table 17- Estimated Surge Level Based on Flood Frequency ... 114
Table 18- Historical Tsunamis Reported in the Nome Area ... 118
Table 19- Vulnerability Overview ... 134
Table 20- Estimated Population and Building Inventory ... 135
Table 21- Critical Facilities and Infrastructure in Wales ... 138
Table 22- Vulnerability Exposure Analysis ... 142
Table 23- Wales' Completed Capital Improvement Projects (1997-2010) ... 148
Table 24- Native Village of Wales Capability Assessment ... 152
Table 25- City of Wales Capability Assessment ... 154
Table 26- Mitigation Goals ... 157
Table 27- Proposed Mitigation Actions Not Selected for Inclusion in the MAP ... 157
Table 28- Evaluation Criteria for Mitigation Actions ... 158
Table 29- Native Village and City of Wales' Mitigation Action Plan (MAP) ... 160
Table 30- Annual Review Checklist ... 171

Acronyms/Abbreviations

°F	Degrees Fahrenheit
AICC	Alaska Interagency Coordination Center
AK	Alaska
BRIC	Building Resilient Infrastructure and Communities
BSRHA	Bering Straits Regional Housing Authority
CFR	Code Of Federal Regulations
City	City of Wales
COW	City of Wales
CS	Cryosphere
DCCED	Department of Commerce, Community, and Economic Development
DCI	Disaster Cost Index
DCRA	Division of Community and Regional Affairs
DGGS	Division of Geological and Geophysical Survey
DHS	Department of Homeland Security
DHS&EM	Division of Homeland Security and Emergency Management
DMA 2000	Disaster Mitigation Act Of 2000
DMVA	Department of Military and Veterans Affairs
ENSO	El Niño/La Niña Southern Oscillation
EPA	Environmental Protection Agency
EQ	Earthquake
ER	Erosion
FEMA	Federal Emergency Management Agency
FLD	Flood
ft	Feet
GIS	Geographic Information System
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
Kts	Knots
LS	Landslide
M	Magnitude
MAP	Mitigation Action Plan
MH	Multi-Hazard
MJHMP	Multi-Jurisdictional Hazard Mitigation Plan
MLLW	Mean Lower Low Water
MMI	Modified Mercalli Intensity
mph	Miles Per Hour
NCAR CCSM4	National Center for Atmospheric Research Community Climate System Model 4.0
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NVOW	Native Village of Wales
NWS	National Weather Service
PGA	Peak Ground Acceleration
RCP(s)	Representative Concentration Pathway(s)
SHMP	2023 Alaska State Hazard Mitigation Plan
SNAP	Scenarios Network for Alaska + Arctic Planning
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act

Acronyms/Abbreviations

SW	Severe Weather
Tribe	Native Village of Wales
TS	Tsunami
UAF	University of Alaska Fairbanks
UR	Uranium
US, U.S., or USA	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDM	U.S. Drought Monitor
USGCRP	United States Global Change Research Program
USGS	United States Geological Survey
WF/TF	Wildland/Tundra Fire
WNC	Wales Native Corporation

EXECUTIVE SUMMARY

This Executive Summary meets the State of Alaska, Division of Homeland Security and Emergency Management's Element H: Additional State Requirements in the Local Mitigation Plan Review Tool.

The purpose of hazard mitigation planning is to reduce or eliminate long-term risk to people and property from natural hazards. The Native Village and City of Wales developed a Hazard Mitigation Plan (HMP) to make the residents of the Wales area less vulnerable to future hazard events. This plan was prepared following the requirements of the Disaster Mitigation Act of 2000 so that the Tribe and City would be eligible for the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance (HMA) grant programs and other federal programs.

The Tribe and City followed a planning process prescribed by FEMA, which began with the formation of a Hazard Mitigation Planning Team comprised of key Tribal and City representatives across various departments. The Planning Team conducted a risk assessment that identified and profiled hazards that pose a risk to Wales; assessed their vulnerability to those hazards; and examined the capabilities currently in place to mitigate them.

The people, property, and lands that the community members depend on are vulnerable to several hazards that are identified, profiled, and analyzed within this Plan. Earthquake, severe weather, wildland/tundra fire, changes in the cryosphere (permafrost degradation, sea ice extent, snow avalanche), naturally occurring uranium, flood, tsunami, erosion, and landslide are among the hazards that could have a significant impact on the people, property, and lands in Wales.

The hazards of greatest concern to the Planning Team are erosion, flood, and severe weather, specifically high winds and winter storms.

Based upon the risk assessment review and goal setting process, the Planning Team developed the following overarching goals for this Plan:

1. Minimize loss of life and property from natural hazard events
2. Increase public awareness of risk from natural disasters
3. Protect public health and safety
4. Promote rapid hazard disaster recovery

The 2024 MJHMP establishes a series of specific mitigation strategies that were developed collaboratively with the intent to meet the identified mitigation goals, by the Planning Team. These strategies provide a basis for continued planning to develop specific action plans. These will be implemented over time and can provide a means to measure progress towards hazard reduction. The Plan also describes future update and maintenance procedures.

COMMUNITY PROFILE

This section describes Wales' location, climate, history, transportation, demographic, and economic information.

It is important to note that Wales is a dry community, and visitors are not permitted to bring alcohol into the Village.

Location

Wales is located on Cape Prince of Wales, at the western tip of the Seward Peninsula, 111 miles northwest of Nome (Figure 1). Wales is the westernmost community on the mainland of North America and lies at approximately 65.6052º North Latitude and -168.0862º West Longitude.

Wales encompasses approximately 2.8 square (sq.) miles of land and 0 sq. miles of water. Wales is located in the Cape Nome Recording District and Bering Strait School District REAA (REAA 02).

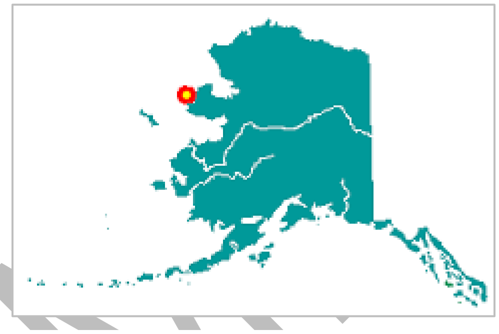


Figure 1- Wales Location Map

A sculpture of an outstretched human hand releasing a dove sits above Wales, Alaska, facing Siberia. The Arctic Arc also known as "the hand" is one of the landmarks that look into tomorrow and symbolizes peace and relationship between the Alaskan and Chukotkan Inuit amidst a history of international tension that spanned since the Cold War. For many years, Inuit have traveled back and forth across the Bering Strait by umiaq to visit and trade with friends and family. These landmarks stand as symbols for the relationship between Alaskan and Chukotkan Inuit.

A corresponding sculpture sits on the Russian side of the Bering Strait. Villagers who helped install the piece of art had to hand-carry each piece up the hill outside town.

Source: USA Today 2016

Figure 2- Arctic Arc Sculpture in Wales

Climate

Wales falls within the transitional climate zone, characterized by tundra interspersed with boreal forests, and weather patterns of long, cold winters and shorter, warm summers. Frequent fog, wind, and blizzards limit access to Wales. Temperatures in Wales range from a winter low of -5 degrees Fahrenheit (°F) to a high of 52° F in the summer. This area receives approximately 12 inches of rain and 76 inches of snow.

Wales is a very windy and wet place, which can make construction challenging.

Table 1 shows average weather data recorded at the Tin City Long Range Radar Station (LRRS) Airport, roughly 5 airmiles southeast of Wales.

Table 1- Average Weather Data for Tin City (2015-2023)

Month	Avg Temp (ºF)	Avg Rainfall (in)	Avg Snowfall (in)	Avg Wind Speed (mph)
January	0º	0.0	7.6	17.5
February	1º	0.1	6.8	17.4
March	2º	0.0	4.9	16.2
April	13º	0.1	4.8	14.6
May	29º	0.4	3.0	12.6
June	40º	0.9	0.5	11.2
July	47º	1.8	0.0	11.3
August	46º	2.4	0.0	12.8
September	40º	1.7	0.3	14.6
October	30º	0.8	2.5	16.0
November	18º	0.3	6.8	17.8
December	7º	0.1	7.1	18.2

Data collected at the Tin City Airport.
Source: Weather Spark (2024)

History

In the early 1900s, Wales became a major whaling center due to its location along migratory routes. It was the region's largest and most prosperous village, with more than 500 residents. Wales has a strong traditional Kingikmiut whaling culture. Ancient songs, dances, and customs are still practiced. In the summer, Little Diomede residents travel between the two villages in large traditional skin boats.

The following is an overview of the history of the community.

500-900 A.D: A burial mound of the Birnirk culture was discovered near Wales and is now a national landmark

1827: The Russian Navy reported the Inupiat villages of Eidamoo near the coast and King-a-ghe further inland

1890: The American Missionary Association established a mission in Wales

1894: A reindeer station was organized

1902: A post office was established

1900s: Wales became a major whaling center due to its location along migratory routes. It was the region's largest and most prosperous village, with more than 500 residents.

1918-1919: The influenza epidemic in 1918-1919 claimed the lives of many Wales residents.

1964: The City of Wales was incorporated as a 2nd Class City.

A 2006 article in the Alaska Magazine, republished in the Anchorage Daily News in 2012, further describes the history of the influenza epidemic and reviving the tradition of whaling in Wales.

On April 14, 1970, the whaling crew set out from Wales, a Bering Strait village straddling the westernmost tip of the North American continent. The tiny Inupiat Eskimo village—a smattering of tin roofs in an unforgiving landscape of jagged rock and moving ice—huddled beneath 2,290-foot Cape Mountain. Siberia lay 56 miles to the west, its shores shrouded by fog. The skies overhead were clear, the temperature around *minus 30 and the wind, as usual on the Bering Strait, blew relentlessly. The hunters shivered on the shore ice for most of the day as they scanned for signs of a bowhead whale.*

In late afternoon, a spout blew through a nearby open lead, and the hunters silently launched their skin boat. Their hearts beat fast, and their hands shook slightly, but the only sound was the faint swishing of paddles as the hunters closed on the whale. An 8-year-old boy hunkering down in the back of the boat wondered what would unfold when they finally encountered the 26-ton beast. Paddling behind the boy was an Inupiat man who had recently returned from the Vietnam War. The boat captain, originally from Little Diomede Island, was the only one who had ever been on a successful bowhead hunt. Five other men were on the boat, including a white teacher towering over the bow with a harpoon.

More was at stake than landing a whale that afternoon in 1970. The hunters were about to restore an ancient tradition, one that had been lost decades earlier during the 1918 flu pandemic when many of the best hunters had died.

As Native villages across Alaska struggle to rediscover traditions lost to time, death and colonialism, this little-known 1970 whale hunt proves it is possible to bring back the past and hold on to it for the future.

Whaling Tradition Fades

Wales was once one of the world's greatest whaling villages. At its peak, as many as 750 people lived in two settlements, hunting thousands of seals and hundreds of walruses every year. In a good year, they landed more than a dozen bowhead whales, and on such occasions, people from across northwestern Alaska and Siberia came to swap caribou skins and sealskins, iron and copper, jade and flint, ivory, and beads. There were big dancing and drumming festivals.

That all began to change in the mid-1800s, when New Englanders and Europeans invaded the Bering Strait, seeking the world's last untouched whaling grounds. More than 50 whaling ships per year passed through the channel, each taking 10 to 15 whales. Eskimos across arctic Alaska began to starve. Still, the people in Wales kept whaling well into the new century and, in spring 1901, crews took eight bowhead whales in a single week.

Their success might have continued had not a strange disease shown up in the village in 1918. That year the Spanish influenza circled the globe, traveling to Alaska aboard steamships. Mail carriers on dog sleds unwittingly spread the virus across the Seward Peninsula, striking Wales and killing at least 170 people—more than half the village's population at the time. Many of Wales' finest hunters died, taking with them centuries-old knowledge and traditions. Elders, the walking encyclopedias of the past, vanished. The village population dropped to 130 people.

By most accounts, the village's crews were unsuccessful at landing a bowhead whale in the years after the pandemic, although they continued to hunt smaller species like beluga and gray whales. Then, in 1944, another flu outbreak overcame Wales, killing a dozen people. Some surviving families moved to Nome and other towns to be closer to hospitals. "The hunting crews got very small, and the people didn't have the equipment for whaling," said Winton Weyapuk Jr. of Wales. "People thought it was easier to harvest walrus, so they concentrated on that."

Teacher With a Dream

In 1968, during his first spring in Wales, Charles Christensen stood at the edge of the Bering Strait watching bowhead whales pass through the ice-choked channel. He wondered why nobody was hunting. Christensen is most remembered in Wales as the outside teacher who harpooned the village's first bowhead in decades; "The Christensen Whale," the people call it today.

He was a charismatic leader, a family man who loved to hunt. In the 1960s, he and his wife, Sarah, were teachers living a life of adventure, from the far reaches of the South Pacific to the frosted fringes of Alaska. They taught in Samoa before moving to the Alaska village of Shaktoolik. In 1967 they arrived in Wales, where they were the only teachers in the village. Before he died in April 2005 at the age of 73, Christensen *said that his time in Wales was one of the most exhilarating periods of his life. It was a place where he forged friendships and studied the ways of the Inupiat people. "Mr. Christensen learned how to live like the Eskimos," said Raymond Seetook, a whaling captain and lifelong resident of Wales.*

Leland Christensen, son of the late teacher, said that by late 1968 his father was determined to hunt the bowhead whale. His motive was twofold. He wanted to help Wales revive whaling, but he was also driven by the challenge. "My dad was a very busy hunter," Christensen said. "He was the kind of guy who would ask you if you wanted to go hunting, and if you didn't, he'd go out anyway and have a good time." But when it came to an animal weighing more than 25 tons, he would need a crew of hunters. His aspirations to kill a bowhead became the goal of the entire village. Any success would ultimately depend on scores of people, from Wales to Gambell to Barrow. For the people of Wales, it became a quest to reaffirm their roots as great whalers.

Christensen interviewed Wales elders who taught him how to build walrus-skin boats and offered hunting tips, and he got used to being out on the icy Bering Strait with the younger men, shooting walruses and seals. He was good with a rifle, but he had never fired a whaling harpoon. Leland Christensen remembers one winter day when he and his father tested the harpoon. "He strapped the harpoon to a snowmachine sled and hooked it up with a long cord," Christensen said. "When he jerked the cord, it pulled the trigger and shot the round out across the tundra."

Charles Christensen kept meticulous files of his research, which he gave to Silas Komonaseak, a Wales villager who was on the 1970 crew. Komonaseak's son Luther, a whaling captain in the village today, inherited the files. Paging through the reams of notes, letters and diagrams, it's clear that Christensen was obsessed with reviving whaling. On the back of a student's homework assignment, the teacher drew pictures of a bowhead and where the best spots were to strike the whale. He wrote letters to famous whalers from Gambell to Barrow. Eben Hopson Sr., an influential Alaska Native leader from Barrow, wrote to Christensen in 1969, explaining how to divide the bowhead for the community, telling him to pay close attention to which portions go to the elders and the boat captain.

There was another 1969 letter, this one from the Alaska Department of Fish and Game, in which state biologist John J. Burns warned Christensen, "It is most desirable if you proceed with your plans without letting too many people learn of them." An international fight was brewing to protect the bowhead, with some activists calling for a ban on whale hunts in Alaska. Meanwhile, the U.S. government was on the verge of listing the bowhead as endangered. "If it was known that a non-Native man was trying to revive whaling in a historic whaling site, when the outside world was trying to eliminate whaling in these places, there would have been an uproar," recalled Burns. "There was a sense of secrecy to get it done and worry about the consequences later."

And so, a whaling crew soon formed. They were unsuccessful their first year, but the following spring, on April 14, 1970, they landed a bowhead. Thirty-six years later, some of the crewmembers remember it as one of the easiest whale hunts ever.

Landing a Whale

Roy Okpealuk grew up on Little Diomede Island, 26 miles west of Wales in the Bering Strait, where whaling had never ceased. He was the only member of the eight-man crew who had been on a successful bowhead hunt. Okpealuk had moved to Wales and taken a keen interest in helping the village revive the hunt. He captained the 23-foot-long skin boat built by Christensen. The teacher, who had bought and tested the harpoon gun, was assigned the job of striking the whale.

Six other men were on the boat, including Weyapuk, who had just graduated from high school, and his brother Amos. Herb Anungazuk had returned to Wales six months earlier after serving in Vietnam. All three men were paddlers. Silas Komonaseak, another paddler, sat in the middle of the boat. Jerry Fuller, who was in Wales as part of a volunteer program, also helped paddle. Christensen brought along 8-year-old Leland.

By 5:30 p.m., the crew had been on the ice about eight hours. They'd seen many whales pass by, but none close enough to chase. The younger men were eager for the hunt to begin; Okpealuk reminded everybody to stay quiet. Then a bowhead, roughly 26 feet long, emerged less than 200 yards away. The crew silently launched the boat and Okpealuk quickly guided them next to the whale. Christensen struck it with his harpoon and the whale disappeared momentarily. The teacher reloaded the darting gun and, when the whale came back up, he tried to strike it again but the bomb didn't explode. A few minutes later, Christensen delivered the fatal strike, harpooning the whale near its flipper. It took about 10 minutes to tow the whale to the edge of the shore ice.

Anungazuk went back to the village to let people know the crew had gotten a whale. "I told this older lady we landed the whale and she said, 'You lie,'" recalled Anungazuk.

Traditionally, the bearer of good news would have brought a slab of muktuk as proof. But this was the first bowhead the village had taken in decades. It was a learning experience for everybody, especially the younger generation. "One thing that just amazed me was that the elders completely took over after we landed the whale," Anungazuk said. "The older people divided the whale, keeping with tradition."

People from Shishmaref and other villages traveled to Wales to help. The carving went on through the night and into morning until the ice started to crack. By then the village had harvested most of the whale and everyone was smiling. People ate muktuk. Children interviewed the crew for the school newspaper. Young men talked about forming their own crews.

The hunt got little attention beyond the Bering Strait region, and that might have been a good thing for Native whaling villages at the time. On the same day Wales got its whale, the federal government proposed adding the bowhead on the nation's endangered species list. The order was approved six weeks later. Today, bowhead whales remain endangered, but their numbers are on the rise. A federal exemption allows 10 Alaska villages to hunt the bowhead, including Wales, where crews venture onto the Bering Strait each spring. They haven't always been successful, but they have landed at least 10 whales since 1970, including two bowheads in the past five years, as well as gray and beluga whales.

"People in Wales have come to expect the whaling crews to go out every year," said Weyapuk, now a whaling captain himself. "It helps remind us why we live here, that we're still alive and must go on."

(ADN 2012)

Transportation

Wales has a state-owned gravel airstrip with scheduled air service and charter flights. Household goods are flown into the village. There is a 6.5-mile road to Tin City. Heavy freight and cargo are delivered to Tin City by barge and hauled by truck to Wales. Snow machines are used for travel in winter. A winter trail connects Wales to the communities of Brevig Mission, located 50 miles away, and Shishmaref, located 70 miles away. Aluminum boats are used for sea travel. On land, snowmobiles and ATVs provide year-round access to subsistence areas. In previous years, fall storms have caused some flooding and damage due to high winds. The beach is used as a road by the 4-wheelers to go from one end of town to another and also to go up the coast (DCRA 2024).

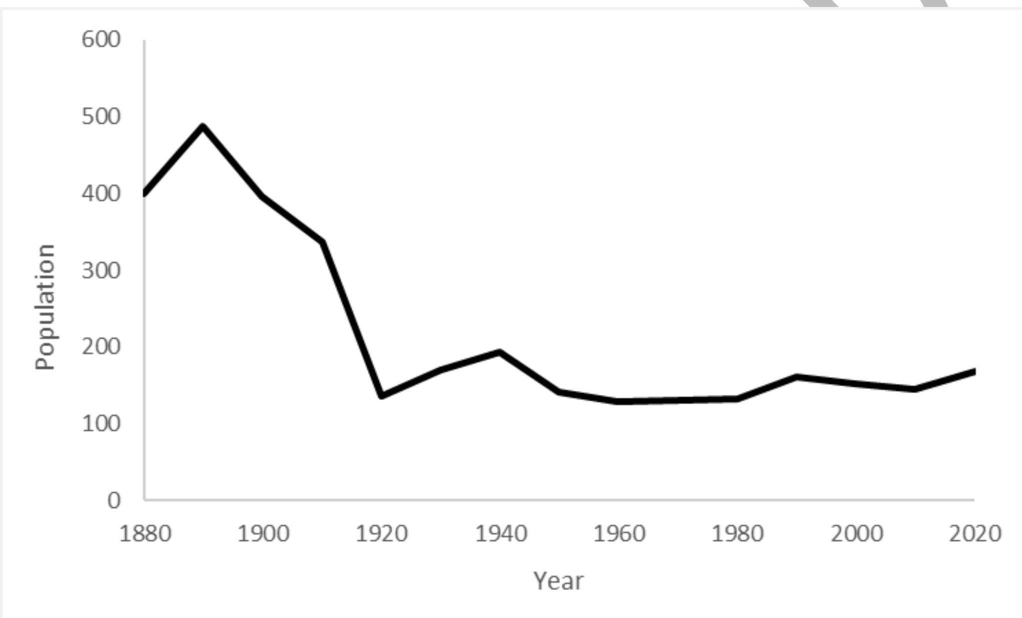
Wales is connected to Tin City by 6.5 miles road. Tin City has a deep water port and is used to unload heavy equipment and building materials for Wales that are then transported via the road. In the winter trails are made across the tundra and ice for travel by snow machine to Shishmaref, Teller, Brevig Mission, and Nome. The rivers, lagoons, and the ocean are used for travel in winter and summer. Local airlines provide service to the community of Wales with year-round, weather permitting.

Heavy freight must come through Tin City because the shallow water around Wales makes it difficult for barges to deliver freight directly. The road between Tin City and Wales is steep and has tight curves in places. Keeping the road in a good state of repair is an ongoing challenge.

The helicopter serving Diomede uses the Wales heliport extensively. Mail going to Diomede ships on Bering Air to Wales, then the helicopter makes trips back and forth from Wales to Diomede to deliver it. Passengers going to Diomede sometimes take the same route as opposed to flying directly from Nome to Diomede.

Demographics

In 2020, the DCRA certified population in Wales was 168 residents, up from 145 residents in 2010. The population is relatively young, and the median age is 23.9 years. 100% of residents identifiy themselves as Alaska Native. The composition of the population is 61.42% female and 38.58% male. There are an estimated 75 households in this community with the average household size of 3.56. It is reported that 68.4% of residents only speak english, while 31.6% speak another language other than english.



Data from DCRA (2024)

Figure 3- Historical Population of Wales

Economy

Wales is a traditional Kingikmiut Eskimo village with a subsistence-based lifestyle.

The potential work force (those aged 16 to 64) in Wales was estimated to be 105, of which 25 (16.1%) were actively employed year-round (US Census 2022). The unemployment rate in Wales is estimated at 20% by American Community Surveys, while the state unemployment rate is currently 4.5% (as of December 2023) and nationally 3.7% (as of January 2024). A 5-year average from 2017-2021 places the median household income at $33,125 (US Census 2022).

86 people are below the poverty level, and 136 people are below 125% of the poverty level (DCRA 2024).

VULNERABILITY SNAPSHOT

	Estimated Losses				Extent (Magnitude/Severity)	Annual Probability	Hazard Explanation
	# of CF:	$ of CF:	# of residences	$ of residences			
Earthquake	38	$69,188,077	35	$25,371,080	Negligible	Likely	Wales is not located near the Aleutian Subduction zone and historical earthquakes have been minor and fewer in number compared to areas along the subduction zone and the rest of the state. There are Pre-Quaternary faults (not active in over 1.6 million years) near Wales, but they are not named. Wales has not been severely impacted by historical earthquakes.
Severe Weather	38	$69,188,077	35	$25,371,080	Critical	Highly Likely	Wales experiences severe weather events such as the following: extreme cold, freezing rain/ice storms, heavy and drifting snow, winter storms, blizzards, heavy rain, high winds, and droughts.
Wildland/Tundra Fire	38	$69,188,077	35	$25,371,080	Negligible	Unlikely	Wales is located in the EC5 Level II Ecoregion which is classified as Bering Tundra. The Seward Peninsula is a predominantly treeless region and the vegetation/landcover class of this region is primarily made up of sparse vegetation containing trees, shrubs, and herbaceous cover. Ecoregion EC5 has a low fire load, but fires do happen under favorable conditions. Mainly short lived as moisture frequently impacts the west coast. However, with certain combinations of fuel availability, weather, topography, and sources of ignition, wildland fires may occur near Wales. Wales is occasionally impacted by smoke from distant wildfires that impacts their air quality.
Changes in the Cryosphere	38	$69,188,077	35	$25,371,080	Critical	Highly Likely	Hazards associated with permafrost degradation, sea ice extent, and snow avalanches occur in Wales. Wales has historically had continuous permafrost. Thawing permafrost has led to subsidence and heaving on subsistence trails, roads and underneath some homes. Sea ice in the Bering Sea has been declining and has impacted the community's subsistence lifestyle. An avalanche in the early 1900s resulted in a fatality in the community.
Naturally Occurring Uranium	Uranium in drinking water is a public health concern, but impacts are not anticipated to cause infrastructure damage.				Limited	Highly Likely	A uranium deposit discovered in 1977 in western Alaska, by means of airborne radiometric data, is the largest known in Alaska on the basis of industry reserve estimates. The major radioactive minerals in placer concentrations from the Cape Mountain area in the western Seward Peninsula are monazite, xenotime, and zircon. The source of the radioactive minerals is likely the granite at Cape Mountain, although they may be genetically related to the tin deposits in the area. Wales regularly tests their drinking water for levels of uranium.
Flood	12	$24,075,000	0	$0	Critical	Likely	Wales is located on the coastline and experiences coastal flooding associated with Bering Sea storms. Wales is not threatened by riverine flooding, but a creek near the Village does occasionally overtop due to heavy rain or storms. The Denali Commission 2019 Statewide Threat Assessment provides statewide risk ratings for flooding. Wales is located in Group 3, which are the communities that are least threatened by flooding.
Tsunami	12	$24,075,000	0	$0	Critical	Possible	There has never been a tsunami observed in Wales, but members of the Planning Team recall that when they were young, they prepared for a tsunami following an earthquake and went to higher ground, but no tsunami came. Wales does not have inundation mapping to determine if/how a tsunami would impact the community. Until mapping can be done, the Planning Team wanted to profile the hazard.
Erosion	7	$22,000,000	4	$2,899,552	Critical	Likely	Wales is located on the coastline and experiences coastal erosion associated with Bering Sea storms. From 1950-2012, Wales was losing approximately 5.6 feet of shoreline per year. Facilities in Wales have been impacted by erosion including the school, old church, clinic, washeteria, teacher housing, 4 homes, the cemetery, and subsistence trails.
Landslide	1	$120,000	0	$0	Negligible	Possible	Landslides may occur on Cape Mountain, 3 miles SE of the community. The mountain has granite formations that are massive and jointed.
Volcano	Volcanoes do not pose a direct threat to Wales.						Wales is not located near any active volcanoes and volcanic ash does not pose a direct threat to the community. Wales may be indirectly impacted by a future volcanic eruption as travel/supplies may be delayed from Nome, Anchorage or Seattle if planes are not permitted to travel due to ash or other volcanic hazards.

CF: Critical Facilities

CRITICAL FACILITIES AND INFRASTRUCTURE IN WALES

Facility Type	# of Occupants	Facility Name	Address	Latitude	Longitude	Estimated Value	Building Type	Facility Owner	Cryosphere	Earthquake	Flood	Erosion	Landslide	Severe Weather	Tsunami	Volcano	Tundra Fire	Uranium
Government	7	Tribal Office (secondary shelter location)		65°36'38"N	168°05'23"W	$500,000	W2	NVOW	x	x				x			x	
	2	City Office		65°36'32"N	168°05'28"W	$500,000	W2	COW	x	x				x			x	
	1	Post Office		65°36'38"N	168°05'22"W	$250,000	W2	Gov't	x	x				x			x	
	6	Wales Native Corporation Office		65°36'24"N	168°05'18"W	$750,000	W2	WNC	x	x	x			x	x		x	
Emergency Response	0	Fire Dept- Code Red		65°36'41"N	168°05'18"W	$75,000	N/A	COW	x	x				x			x	
Education	42	Kingikmiut School (primary shelter location)		65°36'18"N	168°05'09"W	$17,000,000	W2	BSSD	x	x	x	x		x	x		x	
Medical	1	Toby A. Health Clinic		65°36'21"N	168°05'10"W	$1,500,000	W2	NSHC	x	x	x	x		x	x		x	
	5	New Clinic		65°36'42"N	168°05'20"W	$3,000,000	W2	NSHC	x	x				x			x	
Roads/ Bridges	0	15.5 miles of road				$9,100,000	Gravel		x	x				x			x	
	0	Village Creek Bridge		65°36'34"N	168°05'29"W	$50,000	Bridge	COW	x	x				x			x	
Transportation	0	Wales Airport		65°37'22"N	168°05'42"W	$17,000,000	Airport	DOT	x	x				x			x	
	1	Airport Maintenance Shop		65°36'59"N	168°05'37"W	$1,758,077	W2	DOT	x	x				x			x	
	0	Lopp Lagoon Boat Launch		65°37'35"N	168°02'25"W	$750,000	N/A	COW	x	x				x			x	

Facility Type	# of Occupants	Facility Name	Address	Latitude	Longitude	Estimated Value	Building Type	Facility Owner	Cryosphere	Earthquake	Flood	Erosion	Landslide	Severe Weather	Tsunami	Volcano	Tundra Fire	Uranium
Utilities	0	Groundwater Wells (2)		65°36'56"N	168°04'26"W	$120,000	N/A	COW	x	x			x	x			x	
	0	500-gallon water storage		65°36'31"N	168°05'27"W	$85,000	PWTS	COW	x	x				x			x	
	0	BSSD water storage tanks		65°36'16"N	168°05'10"W	$500,000	PWTS	BSSD	x	x	x			x	x		x	
	0	Septic Systems x2		65°36'14"N	168°05'05"W	$225,000	WWTS	COW	x	x				x			x	
	0	Landfill (Class 3 9932-BA001)		65°37'12"N	168°06'18"W	$25,000	N/A	COW	x	x	x			x	x		x	
	0	Wales Tank Farm		65°36'22"N	168°05'06"W	$1,000,000	PWTS	COW	x	x				x			x	
	0	Power Plant		65°36'30"N	168°05'26"W	$800,000	EPPS	AVEC	x	x				x			x	
	0	Windmills (non-operable)		65°36'57"N	168°05'13"W	$800,000	EPPS	KEA	x	x				x			x	
	0	AT&T Alascom		65°36'57"N	168°05'18"W	$500,000	CBO	AT&T	x	x				x			x	
	0	GCI		65°36'58"N	168°05'22"W	$250,000	CBO	GCI	x	x				x			x	
	0	Sewage Lagoon		65°37'23"N	168°06'01"W	$1,000,000	PWSO	COW	x	x				x			x	
Community	1	Multi-Purpose Building		65°36'41"N	168°05'20"W	$2,500,000	W2	NVOW	x	x				x			x	
	0	Storage Vans by Multi x2		65°36'41"N	168°05'20"W	$100,000	N/A	NVOW	x	x				x			x	
	1	Washeteria (existing)		65°36'32"N	168°05'28"W	$2,500,000	W2	COW	x	x	x	x		x	x		x	
	1	Washeteria (new)		65°36'31"N	168°05'28"W	$4,000,000	W2	COW	x	x				x			x	
	5	Teacher Housing 4-plex		65°36'19"N	168°05'08"W	$350,000	W2	WNC	x	x	x	x		x	x		x	
	3	Teacher Housing 2-plex		65°36'19"N	168°05'08"W	$350,000	W2	BSSD	x	x	x	x		x	x		x	
	0	Community Plot		65°36'59"N	168°05'21"W	$100,000	Gravel	TRI-Entities	x	x				x			x	
	1	Morgue		65°36'43"N	168°05'20"W	$150,000	W2	NSHC	x	x				x			x	

Facility Type	# of Occupants	Facility Name	Address	Latitude	Longitude	Estimated Value	Building Type	Facility Owner	Cryosphere	Earthquake	Flood	Erosion	Landslide	Severe Weather	Tsunami	Volcano	Tundra Fire	Uranium
	1	ARCS		65°36'44"N	168°05'20"W	$250,000	W2	WNC/ COW	x	x				x			x	
	2	Church		65°36'20"N	168°05'12"W	$300,000	W2	Wales Lutheran	x	x	x	x		x	x		x	
	2	Parsonage		65°36'20"N	168°05'13"W	$300,000	W2	Wales Lutheran	x	x	x			x	x		x	
	1	Wales Native Store		65°36'21"N	168°05'14"W	$500,000	W2	NVOW	x	x	x			x	x		x	
	0	Cemetery		65°36'48"N	168°05'46"W	Undefined	N/A	COW	x	x	x	x		x	x		x	
	0	Tin City LRRS (tertiary shelter location)		65°33'53"N	167°58'03"W	Undefined	Concrete	US Air Force	x	x				x			x	
	0	Culturally Sacred or Significant Sites																
	0	Subsistence Camps																
Total:	83				Total:	**$68,938,077**												

Uranium in drinking water is a public health concern, but impacts are not anticipated to cause infrastructure damage.

Note: Locations of culturally sacred or significant sites and subsistence camps are confidential. If you need assistance with these locations and loss estimates, please contact the Native Village of Wales.

MITIGATION ACTION PLAN (MAP)

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
MH 1	Hold an annual hazard meeting to provide information to residents about recognizing and mitigating all natural hazards that affect the community.	H	Tribe, City	Tribe, City	Annually	B/C: Sustained mitigation outreach program has minimal cost and will help build and support area-wide capacity. This type of activity enables the public to prepare for, respond to, and recover from disasters. Another benefit is this meeting could complete the annual HMP review questionnaire by reviewing hazard impacts and mitigation project status. TF: This low-cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments.	LEDP, SCERP	x	x	x	x	x	x	x	x	x
MH 2	Identify and pursue funding opportunities to implement mitigation actions and to keep mitigation plan up to date (every 5 years).	H	Tribe, City	Tribe, City, FEMA, BIA, DHS&EM, Kawerak	Annually	B/C: Having an active HMP in place allows the Tribe and City to be eligible for mitigation action funding. This is essential to decrease Wales' vulnerability from natural hazards. TF: This project is technically feasible with Tribal, City, or subcontractor resources.	LEDP, SCERP, LRTP	x	x	x	x	x	x	x	x	x
MH 3	Develop, produce, and distribute information materials concerning mitigation, preparedness, and safety procedures for all identified natural hazards.	H	Tribe, City	Tribe, City, FEMA, BIA, DHS&EM	1-3 years	B/C: This project would provide written materials to residents to educate them on mitigation, preparedness, and safety procedures in the event of a disaster. TF: This low cost project is technically feasible with the purchase/development of the materials. FEMA or other agencies may be able to provide this information with little to no cost to the community.	LEDP, SCERP	x	x	x	x	x	x	x	x	x
MH 4	Review existing Small Community Emergency Response Plan (SCERP) and determine if an update is needed.	H	Tribe, City	Tribe, City, DHS&EM	Annually to Triennially	B/C: The SCERP is a new and exciting approach to emergency management for small communities. The SCERP is a customized flipbook with essential, community-specific information for responding to the first 72 hours of a disaster. Wales has an existing SCERP, and the State requires reviews every 3 years. The Planning Team would prefer to conduct annual reviews due to turnover in the Tribe/City and on the SCERP team. TF: This project is technically feasible with Tribal/City resources and assistance from DHS&EM to update the SCERP.	SCERP	x	x	x	x	x	x	x	x	x
MH 5	Pursue funding for development and update of existing community plans (land use plan, small community emergency response plan, economic development plan, transportation plan, etc.)	H	Tribe, City	Tribe, City, FEMA, BIA, DHS&EM	Annually	B/C: Coordinated planning ensures consistent information and community needs are documented. TF: This is feasible to accomplish with funding and contractor support combined with local planning team involvement.	LEDP, SCERP, LRTP, LUP	x	x	x	x	x	x	x	x	x
MH 6	Pursue funding to develop a Debris Management Plan to identify resources available to support post hazard event debris removal.	H	Tribe, City	Tribe, City, FEMA, BIA, DHS&EM	1-5 years	B/C: Debris management plans are an essential disaster management tool than are focused on coordinated planning that enables effective damage abatement and ensures proper attention is assigned to reduce losses, damage, and materials management. TF: This action is feasible with limited fund expenditures but may require a contractor to develop the plan.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 7	Elevate or relocate structures from hazard prone areas.	H	Tribe, City	Tribe, City, FEMA, BIA	Ongoing	B/C: This project would remove threatened structures from hazard areas, eliminating future damage while keeping land clear for perpetuity. TF: This project is feasible with funding to elevate/relocate structures. Acquiring contractor expertise would be required.	LEDP, LRTP, LUP	x	x	x	x	x	x	x	x	x
MH 8	Install two warning sirens in the community (one in the main village and one in northern area of community) to alert residents of incoming hazards or other events, such as polar bear sightings. Test sirens regularly.	H	Tribe, City	Tribe, City, FEMA, BIA, NOAA	1-5 years	B/C: Installing sirens would ensure that the community is notified in the event of incoming severe weather or other hazards, such as a polar bear in the community. TF: This project is technically feasible with the purchase of the sirens and land to install them. Someone would need to be appointed to regularly test and utilize the sirens as needed.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 9	Identify and inventory subsistence use camp locations and equipment to determine if a community owned (Tribe or City) property and equipment should be purchased or allocated for shared use of community members to reduce food security issues associated with hazard related damages to subsistence use camps	H	Tribe, City	Tribe, City, FEMA, BIA, USDA	1-5 years	B/C: This project would inventory use in specific geographic areas to identify a beneficial area to be shared by community members for subsistence hunting, fishing, and berry picking and proceed to purchase the property for formal ownership by the Tribe or City. Costs would depend on the property value and location. Protection of the assets and equipment would reduce food security issues. TF: This project is feasible with community commitment, but maybe politically difficult to complete.	LEDP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 10	Prohibit construction in identified hazard areas	H	Tribe, City	Tribe, City	Ongoing	B/C: The community has identified major problem areas which are prone to flooding and erosion, and has already begun building new facilities away from the shoreline in higher elevations. Enacting an ordinance or regulation to not build in identified hazard areas would reduce eventual relocation costs and life/property protection. TF: This project is technically feasible but would require an ordinance or regulation to execute. Enforcement may be a challenge.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
MH 11	Continue to pursue funding to maintain the road to Tin City	H	Tribe, City	Tribe, City, FEMA, DOT, Kawerak	Ongoing	B/C: The road to Tin City regularly needs repairs due to erosion and flooding. This is the only road leaving Wales and connects to the nearly abandoned town of Tin City, which serves as a potential shelter location for Wales. TF: This project is ongoing, demonstrating its feasibility.	LRTP, LUP	x	x	x	x		x	x	x	x
MH 12	Support and coordinate with Kawerak to collect and maintain database of critical facilities with before and after photos and evaluation post hazard event	H	Tribe, City	Tribe, City, Kawerak, BIA	Ongoing	B/C: After a disaster, FEMA funds become available to repair damaged structures to their pre-disaster condition. There have been instances where an applicant cannot prove that damage occurred as a result of the disaster or due to deferred maintenance/existing condition (FEMA 2020). In attempts to reduce this potential of ineligibility after a disaster, the Planning Team will create a catalog with images of the current "pre-disaster conditions" of Wales' critical facilities. This catalog will be reviewed/updated every year or as conditions change, and following a significant hazard event. TF: In 2023, Kawerak received a grant from DOT to administer Futurity IT's Orion software in the region. This software will catalogue each community's critical facilities and serve as an automated tool for FEMA post-disaster reporting.	SCERP	x	x	x	x		x	x	x	x
MH 13	Inventory/database of elderly and non-mobile residents to assist in evacuation or inclement weather	H	Tribe, City	Tribe, City, Kawerak, FEMA, BIA	Ongoing	B/C: There are many elderly/non-mobile residents in Wales. This project would ensure that they are informed of incoming severe weather/storms and checked on after the event. TF: This project is technically feasible with a staff member in-charge of the notifications. This project is already occurring in Wales, but would formalize the process.	LEDP, SCERP	x	x	x	x		x	x	x	x
MH 14	Continue to expand Starlink as needed to provide communications redundancy	H	Tribe, City	Tribe, City, Kawerak, FEMA, BIA, HUD	Ongoing	B/C: Starlink is an alternative option to internet that has proven to be a reliable alternative in remote Alaska. Adding additional Starlink in Wales would allow for backup communications in the event internet is lost during a storm. TF: This project is technically feasible as many facilities and residents already have Starlink.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 15	Explore local interest in building a seed inventory to increase food sovereignty	H	Tribe, City	Tribe, City, Kawerak, FEMA, BIA, USDA	Ongoing	B/C: This project aims at increasing food sovereignty by creating and inventory of seeds and other subsistence foods in the community that are being impacted by climate change. TF: This product is typically feasible with community support and a location to store the inventory.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 16	Repair or replace leaking fuel storage tanks	H*	Tribe, City	Tribe, City, FEMA, BIA, ANTHC, ADEC	Ongoing	B/C: Leaking fuel storage tanks is an ongoing issue for Wales. The community has difficulties getting diesel fuel due to unreliable storage tanks. TF: This project is technically feasible with funding to repair or purchase new fuel storage tanks.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 17	Pursue funding to relocate the existing landfill away from the airport and close out existing landfill and leach field	H	Tribe, City	Tribe, City, FEMA, BIA, ANTHC, EPA, DOT, ADEC	1-10 years	B/C: The existing landfill is old and too small to meet current community needs. The current fencing is too low, and trash regularly blows out of the landfill and into the community. DOT has also advised that the landfill is too close to the airport and needs to be relocated. TF: This project is technically feasible after determining a suitable location for the new landfill and funding to execute the project. An outside contractor is likely necessary to complete the project. The Tribe would need to reinstate the IGAP program to execute this project.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 18	Relocate, improve, and expand the cemetery. Record names and re-mark graves	H	Tribe, City	Tribe, City, BIA, Kawerak, Veterans Cemetery Grants, NPS Grants, National Trust for Historic Preservation	Ongoing	B/C: There is one main cemetery in Wales. There are several historical and individual grave sites in and around the village. Over the years there have been issues with exposed coffins, erosion, unmarked graves, and some markers are buried. Residents love their families and want to honor and respect those who have passed on before (2011-2016 LEDP). The main cemetery is too close to the shore. It is full and in need of maintenance or expansion. The cemetery needs to be renovated and maintained or relocated. The other historical and individual grave sites need to be protected or relocated. All graves need to have proper markers. Protecting the cemetery will honor Wales' ancestors and teach the children to have respect. It will also make the community safer and more beautiful (2011-2016 LEDP). TF: This project is technically feasible with community support and a location out of hazard areas. Mapping efforts began in 2011 but the Tribe nor City are able to locate the map.	LEDP, LUP	x	x	x	x		x	x	x	x
MH 19	Work with construction contractors to identify historical campsites and other sacred sites when selecting areas for future development	H	Tribe, City	None needed	Ongoing	B/C: This project aims to reduce disturbance to historical and sacred areas in the community during construction or development. TF: This project is ongoing, demonstrating its feasibility. This could be included as a requirement and future RFPs.	LEDP, LRTP	x	x	x	x		x	x	x	x

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
MH 20	Repave the airport runway and pursue funding to upgrade the airport to include a crosswind runway	H	Tribe, City	Tribe, City, FEMA, FAA, DOT	1-10 years	B/C: The Wales airport has daily flights (weather permitting) from several regional airlines. Each airline has local agents. Wales depends on its runway for deliveries of freight and mail. Wales depends on the runway as the primary means of access in and out of the community, which can be critical in times when healthcare is needed. The gravel runway is regularly maintained. The length is acceptable for most aircraft currently flying to Wales. There is no crosswind runway, and flights are canceled due to winds when necessary. The current material on the existing runway has some issues and is eroding faster than expected (2011-2016 LEDP). TF: This project is technically feasible with proper funding and an adequate gravel source. The Tribe has had ongoing discussions with DOT about this project and has written many resolutions to move the project forward.	LEDP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 21	Work with Kawerak Transportation Program to develop a Long Range Transportation Plan (LRTP)	H	Tribe, City	Tribe, City, Kawerak	Ongoing	B/C: A LRTP is a plan that outlines transportation priorities. The Tribal Safety Management Plan (TSMP) provides goals within the community and its surrounding boundaries, as well as the planning for using funding from Tribal Shares monies allocated by the Federal Highway Administration (FHWA) Tribal Transportation Program (TTP) and other funding to leverage projects as allowed. TF: This project is technically feasible with Kawerak, and the Wales LRTP is currently in final draft form.	LEDP, LRTP	x	x	x	x		x	x	x	x
MH 22	Evaluate current sewage lagoon to determine if the site can be upgraded or if it needs to be closed and a new lagoon constructed	H	Tribe, City	Tribe, City, FEMA, EPA ANTHC, ADEC	1-5 years	B/C: The existing sewage lagoon is in need of upgrades or closed and replaced. TF: This project is technically feasible with proper agency support and funding.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 23	Purchase heavy equipment and storage facility specifically for the landfill to be able to deploy before, during, or after a hazard event	H	Tribe, City	Tribe, City, FEMA, DOT	Ongoing	B/C: The community has existing heavy equipment for projects and the community, but the landfill regularly needs maintenance and cleanup. Dedicated equipment and storage at the landfill would alleviate the sharing of resources. TF: This project is technically feasible with the purchase of equipment and storage facility. The Tribe and City have already purchased a plot of land for the storage facility.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 24	Pursue funding for a seawall to protect the community from future flooding and erosion events	H	Tribe, City	Tribe, City, FEMA, USACE, MARAD	1-10 years	B/C: Wales sits on the shoreline of the Bering Sea and is regularly threatened by flooding and erosion. A seawall would help protect the community from future events, saving lives and protecting infrastructure. TF: This project is technically feasible with funding and agency support. A feasibility study would need to be conducted to determine if a seawall would be an effective protection measure.	LEDP, LUP						x	x	x	
MH 25	Pursue funding to develop a small boat harbor facility to provide protected moorage for boats operating out of Wales	H	Tribe, City	Tribe, City, FEMA, USACE, MARAD	1-10 years	B/C: Wales is a subsistence-dependent community and residents regularly utilize small boats to go fishing and hunting. Currently, small boats are stored on the lagoon or in open water. Building a small boat harbor would allow for safe storage of equipment and protection during storms. TF: This project is technically feasible with funding and agency support. In conjunction with a feasibility study, the Tribe and City would request input from boat owners on the location of the boat harbor.	LEDP, LUP						x	x		
MH 26	Continue working with BSRHA to upgrade and add additional housing in Wales. Research potential mechanisms for personal loans for residents to build their own homes to meet community housing needs	H	Tribe, City	Tribe, City, BIA, FEMA, HUD, BSRHA	Ongoing	B/C: BSRHA is the designated Tribal housing authority in the Bering Straits region that receives federal housing funding on behalf of the Tribes. Allocation of funds is determined on need and regular building rotation. Wales recently received 6 new homes in the Village, but the majority of the existing housing is outdated and not weather resistant. TF: This project is ongoing, demonstrating its feasibility.	LEDP, LUP	x	x	x	x		x	x	x	x
MH 27	Continue working with Kawerak to obtain a VPSO to serve in Wales	H	Tribe, City	Tribe, City, Kawerak, State of Alaska	Ongoing	B/C: The Village Public Safety Officer (VPSO) Division began as a conceptual program in 1979 to address Alaskan rural public safety. VPSOs provide public safety services in rural Alaska by decreasing the response time to emergencies and providing an ongoing proactive public safety presence in rural and remote communities of Alaska. A certified VPSO is a peace officer trained in law enforcement, fire protection, emergency medical assistance, community policing, search and rescue, and crime prevention. The presence of a VPSO in a community can have a positive impact on a community. Wales does not currently have a VPSO. TF: This project is technically feasible with support from Kawerak and willingness from the community.	LEDP, SCERP	x	x	x	x		x	x	x	x
MH 28	Assess current storage buildings to determine if additional storage is needed. If needed, pursue funding to build additional storage facilities to support the community with emergency supplies in the event of a hazard event	H	Tribe, City	Tribe, City, FEMA, Kawerak	Ongoing	B/C: Wales as limited storage options and current storage buildings are full. The Tribe/City will assess current storage and determine if contents can be rearranged/relocated or if additional storage is needed. TF: This project is technically feasible with Tribal/City resources.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 29	Renovate and relocate the church away from hazard areas	M	Tribe, City	Tribe, City, FEMA, BIA	1-5 years	B/C: The church is an important community facility, and it is currently threatened by flooding and erosion and is need of cosmetic and structural repairs. The renovated church will serve as an alternate shelter location. TF: This project is technically feasible with funding for renovation and relocation.	LEDP, SCERP, LUP	x	x	x	x		x	x	x	x

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
MH 30	Pursue funding to build long and short term housing for stranded visitors traveling to Diomede or Shishmaref	H	Tribe, City	Tribe, City, FEMA, HUD, BSRHA	1-5 years	B/C: Residents/travelers to Diomede and Shishmaref are regularly grounded in Wales due to weather conditions. Diomede has a storage conex at the Wales airport for grocery storage when Diomede residents are stranded in Wales. Housing in Wales is already limited and there are no accommodations for stranded travelers. TF: This project is technically feasible with funding for the housing and land to build on.	LEDP, LUP	x	x	x	x		x	x	x	x
MH 31	Purchase generators for the Tribal and City offices to utilize in case of sheltering during hazard events	H	Tribe, City	Tribe, City, FEMA, BIA, Kawerak	1-3 years	B/C: The Tribal and City offices are secondary shelter locations in the event of a hazard event or disaster. These facilities are in need of generators to produce electricity during a power outage. TF: This project is technically feasible with the purchase of the generators.	LEDP, SCERP	x	x	x	x		x	x	x	x
MH 32	Continue to build new developments on higher elevations in the community away from the shoreline	H	Tribe, City	Tribe, City, FEMA, HUD, BSRHA	Ongoing	B/C: The community has begun to build new facilities and homes in a higher elevation away from the shoreline. This reduces the potential costs associated with future elevation or relocation of facilities built in lower elevation. TF: This project is ongoing, demonstrating its feasibility.	LEDP, SCERP, LRTP						x	x	x	
MH 33	Pursue funding to build a new Native store at a higher elevation to promote food sovereignty	H	Tribe, City	Tribe, City, FEMA, BIA, HUD	1-5 years	B/C: The Native store is the only store in the Village for residents to purchase food and other supplies. The store is built in a lower elevation and is susceptible to flooding and erosion impacts. A larger and more structurally sound Native store would ensure that the community has access to food and can stockpile additional supplies to prepare for hazard events. TF: This project is technically feasible with funding for the facility and land acquisition.	LEDP, LUP						x	x	x	
MH 34	Explore the feasibility of installing solar panels in Wales to offset electricity costs	H	Tribe, City	Tribe, City, FEMA,AVEC, ANTHC	1-5 years	B/C: Finding lower-cost alternatives to power generation is a priority for the Planning Team. Historically, KEA had installed windmills in Wales, but they are no longer functional and need to be removed from the Village. Solar panels may be a feasible alternative for power generation. TF: This project is technically feasible with support for a feasibility study and funding to purchase the solar panels.	LEDP, LUP	x	x	x	x		x	x	x	x
MH 35	Work with EPA to reinstate the Indian Environmental General Assistance Program (IGAP) Coordinator position in Wales	H	Tribe, City	Tribe, City, EPA	1-3 years	B/C: In 1992, Congress passed the Indian Environmental General Assistance Program Act. This act authorized EPA to provide General Assistance Program (GAP) grants to federally recognized tribes and tribal consortia for planning, developing, and establishing environmental protection programs in Indian country, and for developing and implementing solid and hazardous waste programs on tribal lands. The goal of GAP is to assist tribes and intertribal consortia in developing the capacity to manage their own environmental protection programs and to develop and implement solid and hazardous waste programs in accordance with the individual tribal needs and applicable federal laws and regulations. TF: Wales has had an IGAP coordinator in the past, but that position is no longer filled period. In order to execute this project, someone in the community would need to be willing to step into the role.	LEDP	x	x	x	x	x	x	x	x	x
MH 36	Investigate historical gas/oil spill at the school to determine if it was properly cleaned up and resultant impacts to clams	H	Tribe, City	Tribe, City, EPA, DEC, USCG	1-5 years	B/C: The Planning Team expressed concerns with the decline of clams that are typically found near Wales. There had been a historical gas and oil spill near the school that resulted in 20,000 gallons of fuel being swept into the ocean. The community was not aware of the spill until they smelled it on the beach. The City is unsure if it was properly cleaned up. TF: This project is technically feasible with support from agencies. The City is currently working with BSSD and the USCG to document the extent of the spill.	LEDP	x	x	x	x		x	x	x	x
MH 37	Build a new community playground away from hazard areas	H	Tribe, City	Tribe, City, FEMA, Kawerak, BIA	1-5 years	B/C: The current playground is near the school and is threatened by flooding, tsunami, and erosion. TF: This project is technically feasible with funding to construct the playground away from hazard areas.	LEDP, LUP						x	x	x	
MH 38	Coordinate with BSSD on flood and erosion vulnerability at the school. Complete retrofits to ensure the school withstands future hazard events as the school is used as the primary shelter for the community	H	Tribe, City	Tribe, City, FEMA, BSSD, HUD	Ongoing	B/C: The school is an important piece of infrastructure in the community and is threatened by flooding, tsunami, and erosion. The school is a community meeting place and the primary community shelter in the event of a hazard event or disaster. This project would be a collaborative effort with BSSD. TF: This project is technically feasible with support from BSSD and funding to complete the retrofitting.	LEDP, LUP						x	x	x	
MH 39	Pursue funding to repair and expand the Village Creek Bridge near the school	H	Tribe, City	Tribe, City, FEMA, BIA, ADOT&PF	1-10 years	B/C: The current bridge near the school is not structurally sound and is a safety hazard to travelers. The Planning Team also expressed concerns with the width of the bridge as two ATVs/snowmachines cannot pass at the same time. When the bridge is repaired, considerations for widening it should be considered. TF: This project is technically feasible with funding for the repairs and expansion of the bridge.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 40	Create requirements that contractors must cleanup after construction and remove construction and hazardous waste after construction is complete	H	Tribe, City	None needed	Ongoing	B/C: The Planning Team has expressed concern over past contractors not properly disposing of construction materials and hazardous waste after the project is complete (see Figure 77 and Figure 78). This no cost project would include this requirement in future RFPs as a requirement of the selected contractor. TF: This project is technically feasible with this requirement included in future RFPs.	LEDP, LRTP	x	x	x	x		x	x	x	x

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
MH 41	Require projects being built in the community have regular meetings with Tribe and City to update on progress (with quarterly reporting) to identify issues and progress (codes, inspections, schedules)	H	Tribe, City	None needed	Ongoing	B/C: The Planning Team has expressed concern over past contractors not regularly communicating with Tribal and City leadership on the status of projects. The Tribal and City leadership would like to take a more active role in the status updates of future projects in the community. This no cost project would include this requirement in future RFPs as a requirement of the selected contractor. TF: This project is technically feasible with this requirement included in future RFPs.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 42	Require new facilities to be built to State Building Code and 3rd party inspectors are included in the project costs	H	Tribe, City	None needed	Ongoing	B/C: While Wales does have building codes, the Planning Team understands the importance of building new facilities up to code to withstand future hazard events. While the City cannot enforce building to code, they can include this in future RFPs for the selected contractor to abide by. TF: This project is technically feasible with this requirement included in future RFPs.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 43	Work with reindeer herders to develop strategies to protect the herd	H	Tribe, City	Tribe, City	Ongoing	B/C: The reindeer are an important asset to the Tribe, and the Planning Team would like to coordinate with reindeer herders in the community to determine how they can support the herders and the reindeer herd. TF: This project is technically feasible with existing Tribal and City resources.	LEDP	x	x	x	x		x	x	x	x
MH 44	Fencing or security protection of cultural/historical site at back of Village	H	Tribe, City	Tribe, City, FEMA, BIA	1-5 years	B/C: A historical site at the back of the Village needs fencing for additional security. TF: This project is technically feasible with funding for the site protection.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 45	Pursue funding for community walk-in freezer to support food sovereignty in Wales	H	Tribe, City	Tribe, City, FEMA, BIA, USDA	1-5 years	B/C: In order to increase food sovereignty in Wales, the Planning Team wants to explore purchasing a large walk-in freezer that will hold large amounts of meat and supplies. This would help food sovereignty during hazard events or other times where planes are not able to bring supplies to the Village. TF: This project is technically feasible with funding for the freezer and utilities associated with operating and maintaining it.	LEDP	x	x	x	x		x	x	x	x
MH 46	Pursue SCERP team training - provide EMS & FEMA training resources	H	Tribe, City	Tribe, City, FEMA, BIA, Kawerak, DHS&EM	Ongoing	B/C: The Planning Team recognizes the importance of having properly trained appointees for the execution of the SCERP in the event of an emergency. This project is aimed at providing resources to the SCERP points of contacts. TF: This project is technically feasible with proper training materials and resources.	LEDP, SCERP	x	x	x	x	x	x	x	x	x
MH 47	Begin to collect information on potential whole community relocation	L	Tribe, City	Tribe, City, FEMA, BIA, HUD	Ongoing	B/C: Whole community relocation is a last resort for Wales. The Village holds cultural and sacred significance to community members and their ancestors. The community has already begun to build new infrastructure in higher elevations and away from the shoreline to mitigate future flooding and erosion impacts. While the community's priorities are more aligned with managed retreat and defend in place, the Planning Team wants to start finding information on relocation if and when the time comes. TF: This project is technically feasible as other communities in Alaska have begun the relocation process.	LEDP, LUP, LRTP	x	x	x	x	x	x	x	x	x
EQ 1	Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current State Adopted Building Codes	H	Tribe, City	Tribe, City, FEMA, HUD	Ongoing	B/C: This project would ensure that Wales' critical facilities are prepared for a potential major earthquake and are brought up to code. TF: This project is technically feasible with funding for an inspector and funding to complete retrofitting.	LUP	x								
EQ 2	Install non-structural seismic restraints for large furniture such as bookcases, filing cabinets, heavy televisions, and appliances to prevent toppling damage and resultant injuries to small children, elderly, and pets	L	Tribe, City	Tribe, City, FEMA, HUD	1-3 years	B/C: This lower cost project may help protect Wales residents from injuries during a potential major earthquake. TF: This project is technically feasible with funding for the restraints.	LUP	x								
SW 1	Install window shutters on critical facilities and homes to reduce damage during high wind events and insulate during severe weather events	H*	Tribe, City	Tribe, City, FEMA, HUD, BSRHA	1-3 years	B/C: High winds regularly impact the community and have caused damaged to roofs and blown in doors and windows. The Planning Team states that winds from the south are the most concerning. This project would provide protection to windows on critical facilities and residences. TF: This project is technically feasible with funding for the shutters and support from BSRHA.	LEDP		x							
SW 2	Install additional snow fences in Wales to limit impacts of blowing snow during blizzards and other severe winter weather events by allowing it to catch and collect in specified locations.	H	Tribe, City	Tribe, City, FEMA	1-5 years	B/C: Implementing this mitigation project would allow for better management of snow removal and help prevent disruptions due to heavy buildups of blown snow. TF: This project should be feasible for the community and should not require much expertise beyond some construction knowledge and identifying where the fences would be the most beneficial.	LEDP, LUP		x							
SW 3	Create and install new trail markers to aid travelers during blizzards and other severe weather events. Ensure selected markers do not cause secondary safety hazards to ATVs and snowmachines	H	Tribe, City	Tribe, City, FEMA, BIA, HUD	1-5 years	B/C: Blowing snow and blizzards have created issues for winter travel. Establishing better trail markers may aid winter travelers and reduce injuries. The selected markers should not create secondary safety hazards to ATVs and snowmobiles. TF: This project is technically feasible with funding for the markers.	LEDP, LUP, LRTP		x							

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
SW 4	Ensure homes and facilities have properly secured roofing and insulation to protect from heavy snow, high winds, and extreme cold. If necessary, retrofit buildings to prevent roof collapse from heavy snow buildups.	H	Tribe, City	Tribe, City, FEMA, HUD, BSRHA	Ongoing	B/C: Homes and facilities in Wales are regularly impacted by heaving snow and high winds. Ensuring that roofs are secure, and homes have proper insulation will benefit the community and protect infrastructure. TF: This project is technically feasible with funding. A contractor/building inspector may be required for snow load capacity and insulation installation.	LEDP		x							
SW 5	Educate community members on winter travel safety and proper preparedness	H	Tribe, City	Tribe, City, FEMA	Ongoing	B/C: Winter travel safety is a high priority for the Planning Team. Residents have been seriously injured, killed, and have gone missing due to dangerous travel conditions. Educating the community and youth would hopefully reduce the number of incidents. TF: This project is technically feasible with existing Tribal/City resources.	LEDP, SCERP		x							
SW 6	Evaluate houses in areas with deep snow to retrofit with back door/alternate egress in the event of getting snowed in	H	Tribe, City	Tribe, City, FEMA, BIA, HUD, BSRHA	1-10 years	B/C: During heavy snow events, certain homes regularly get snowed in and residents are unable to exit their home. This project would retrofit affected homes with an alternate exit. TF: This project is technically feasible with funding to evaluate and retrofit homes.	LEDP, LUP		x							
SW 7	Coordinate with BSRHA to not build new housing in heavy snow/drift areas	H	Tribe, City	Tribe, City	Ongoing	B/C: This project is aimed at reducing new development in heavy snow deposit areas. Snow accumulates in portions of the community and residents are frequently snowed in. Coordinating with BSRHA to consider this in future development would reduce this issue. TF: This project is technically feasible with support from BSRHA.	LUP		x							
SW 8	Reimplement travel planning notification form	H	Tribe, City	Tribe, City	Ongoing	B/C: In the past, residents would fill out a "travel planning form" when they were traveling away from the Village. This system would ensure that the Tribe/City would be aware of travel plans in case the traveler did not return on time. If the Tribe/City knew where they were going, they would be able to search for them in a timely manner. TF: This project is technically feasible with existing Tribal and City resources. Community support will be needed to execute this project.	LEDP, SCERP		x							
SW 9	Purchase multiple inReaches/satellite communicating devices for community members to check out during winter travel	H	Tribe, City	Tribe, City, FEMA, BIA	1-3 years	B/C: Many residents do not have Garmin inReaches/satellite communicating devices when they travel out of the Village. This is a safety concern for the Planning Team. The clinic has 1 device for the community to utilize. The Tribe and City want to purchase more devices and allow residents to check them in/out. TF: This project is technically feasible with the purchase of the devices and a system for checking out the devices.	LEDP		x							
TF 1	Educate community members on littering and proper trash/debris removal to reduce fuels for igniting a fire.	H	Tribe, City	Tribe, City	Ongoing	B/C: There are ongoing issues of improper trash disposal and littering in Wales. The trash can blow into the ocean or nearby creeks, and it hurts the beauty of the community. Reindeer and wildlife also eat the litter, which can cause health impacts and reduced food quality for the community. The Planning Team will educate the public on how to dispose of trash and impacts of littering by putting up signs in the community. TF: This project is technically feasible with existing Tribe and City resources.	LEDP			x						
CS 1	Continue using ice monitoring cameras and pursue potential to make data publicly available for residents, visitors, and researchers	H	Tribe, City	Tribe, City, NOAA, UAF, NSF	Ongoing	B/C: From 2006-2011, the Sea Ice Group at the Geophysical Institute at UAF maintained a sea ice webcam in Wales that regularly updated imagery on their website for public use. There are still active webcams in Wales, but the Planning Team is unsure of who is maintaining them and if they are able to publicly access the data. TF: This project is ongoing, demonstrating its feasibility. The owner/operator of the current cameras needs to be determined to see if the data can be made publicly available.	LEDP				x					
CS 2	Educate residents and hunters on sea ice safety during travel and subsistence activities to mitigate dangers of thinning ice cover in the winter	H	Tribe, City	Tribe, City, FEMA, Kawerak	Ongoing	B/C: Thinning sea ice poses a hazard to the safety of subsistence hunters when they travel on the ice. Additionally, uneducated residents and youth could fall through the ice. Flyers hung in the community and in the school could be a potential way to share this information. TF: This project is technically feasible with existing Tribal and City resources.	LEDP				x					
UR 1	Continue to work with NSHC to regularly monitor the quality of water in Wales	H	Tribe, City	Tribe, City, NSHC, DEC	Ongoing	B/C: NSHC regularly tests the quality of drinking water in Wales. This long-term monitoring will allow residents to know what contaminants are present and if special considerations should be made before drinking the water. TF: This project is ongoing, demonstrating its feasibility.	LEDP					x				
UR 2	Explore locations for a new drinking water source and relocate wells	H	Tribe, City	Tribe, City, FEMA, EPA, ANTHC, DEC	1-10 years	B/C: Wales' current drinking water runs through Cape Mountain, and picks up traces of uranium and other contaminants. Finding a new drinking water source may reduce or eliminate certain contaminates. TF: This project is technically feasible with proper agency support	LEDP, LUP					x				
UR 3	Pursue funding to analyze water quality after the use of UV water filters to determine the effectiveness of reducing uranium levels to meet or exceed drinking water quality standards	H	Tribe, City	Tribe, City, FEMA, EPA, ANTHC, DEC	Ongoing	B/C: In 2024, Kawerak received a grant to give each household in Wales a UV/reverse osmosis water purification system. This project would quantify the effectiveness of the filters in reducing uranium concentrations. TF: This project is technically feasible with additional water sampling/testing.	LEDP					x				

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
UR 4	Educate residents and visitors regarding local water quality issues associated with naturally occurring uranium and methods to reduce uranium levels (what works and what does not work)	H	Tribe, City	Tribe, City, Kawerak	Ongoing	B/C: This project is aimed at educating residents and visitors of the local water quality concerns and actions to take to ensure they are drinking clean water. Informing visitors to bring in plastic water bottles may be a way to educate. Alternatively, spreading factual ways of reducing contaminates in water will help educate residents and visitors (for example, boiling water does not reduce uranium levels). TF: This project is ongoing, demonstrating its feasibility. The Tribe and City will work to post signs in the community and near the groundwater wells.	LEDP					x				
UR 5	Coordinate with BSSD to create a school project for the youth in the community to learn how to locally test/sample water quality	H	Tribe, City	Tribe, City, BSSD	Ongoing	B/C: NSHC and DEC regularly test the drinking water in Wales. This project is aimed at educating the youth in the community on how to sample/test their own water to ensure regular updated information and consistency. TF: This project is technically feasible with support from NSHC/DEC, but specialized laboratory sampling equipment is not accessible in Wales.	LEDP					x				
UR 6	Determine the feasibility of installing UV/reverse osmosis water filters at the groundwater wells	H	Tribe, City	Tribe, City, FEMA, EPA, ANTHC, DEC	1-5 years	B/C: In 2024, Kawerak received a grant to give each household in Wales a UV/reverse osmosis water purification system. The Planning Team has concerns of residents actually using the provided filters. This project would aim to look at the feasibility of installing filters at the groundwater well to ensure that residents are drinking clean, safe water. TF: This project is technically feasible with funding for a feasibility analysis and equipment.	LEDP, LUP					x				
UR 7	Request that visitors and contractors haul out plastic water bottles when they leave the Village to reduce waste in the community	H	Tribe, City	Tribe, City	Ongoing	B/C: Visitors/contractors regularly bring in plastic water bottles into the community, however, the existing landfill is overflowing, and Wales does not have a recycling program. This plastic waste regularly blows out of the landfill, and is harmful to the environment. Requiring visitors/contractors to haul out their plastic will reduce the burden on the community to have to burn the plastic and clean it up in their Village. TF: This project is technically feasible with the inclusion of hauling out waste in future RFPs.	LEDP					x				
FLD 1	Assess critical facility elevation and elevate or relocate any critical facilities to meet the recommended building elevation of 16.0 MSL	H	Tribe, City	Tribe, City, FEMA, HUD	Ongoing	B/C: Based on the 2017 USACE Floodplain Manager's report, the 1974 flood level (14.0 MSL) approximates the 100-year (1% chance) return interval storm. USACE recommended that the minimum building elevation is 16.0 MSL to reduce flood impacts. The community has already begun building new facilities in higher elevations. TF: This project is technically feasible with funding for the elevation assessment and relocation/elevation. Land acquisition may be a challenge.	LEDP, LUP						x			
TS 1	Request tsunami inundation mapping to determine if tsunamis pose a threat to Wales	H	Tribe, City	NOAA, AEC	1-5 years	B/C: Currently, there are no communities along the west coast of Alaska that have formal tsunami inundation mapping. It is believed that the Bering Sea/Norton Sound is too shallow to allow for tsunami propagation. However, paleotsunami studies conducted in this region demonstrate that significant tsunamis have occurred in this region in the past, and, therefore, can occur in the future (Medvedeva et al. 2023). Additionally, traditional knowledge in the region has disproved that tsunamis have not occurred in this region. Having formal tsunami inundation completed will visualize how a tsunami would propagate and impact Wales. TF: This project is technically feasible with assistance from the Alaska Earthquake Center through a NOAA grant. Selected communities are not required to match any grant funds.	LEDP							x		
ER 1	Monitor beach elevation to help identify whether and when infrastructure may become exposed to erosion	H	Tribe, City	Tribe, City, FEMA, NSF, NOAA,DGGS	Ongoing	B/C: The erosion forecast method used by Buzard et al. (2021) could not forecast erosion rates in Wales because the model depends on linear erosion of a clearly identified shoreline. The authors suggested this project to be able to forecast future erosion rates in the community. TF: This project is technically feasible with funding for the monitoring equipment and local training for residents.	LEDP								x	
LS 1	Pursue funding to install landslide monitoring equipment at Razorback Mountain	H	Tribe, City	Tribe, City, FEMA, NSF, NOAA,DGGS	1-5 years	B/C: Currently, there is no method of monitoring slope stability of Razorback Mountain. Installing monitoring equipment could help detect a potential landslide early and give the community warning before the event. TF: This project is technically feasible with funding for the monitoring equipment.	LEDP, LUP									x

Plan Integration: LEDP: Local Economic Development Plan, SCERP: Small Community Emergency Response Plan, LRTP: Long Range Transportation Plan, LUP: Land Use Plan

* Highest priority projects

FEMA APPROVAL LETTER

PLAN DISTRIBUTION LIST

The Native Village and City of Wales 2024 Multi-Jurisdictional Hazard Mitigation Plan is distributed to:

- Native Village of Wales
- City of Wales
- Wales Native Corporation
- Kawerak, Inc.
- Federal Emergency Management Agency (FEMA)
- State of Alaska Division of Military and Veterans Affairs (DMVA), Department of Homeland Security and Emergency Management (DHS&EM)

RECORD OF CHANGES

Hazard Mitigation Plans should be continually updated as circumstances change, new data becomes available, hazards are mitigated, etc. This Record of Changes Table is included to summarize and document changes to this document as they are made throughout time.

Change ID	Description of Changes	Date
01	Created a Multi-Jurisdictional HMP for the Native Village of Wales and the City of Wales	Tribe: XX City: XX

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 Native Village and City of Wales 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.
- Helping accomplish other community objectives, such as leveraging capital improvements, infrastructure protection, and economic resiliency.

1.2 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN LAYOUT DESCRIPTION

The Native Village and City of Wales 2024 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) consists of the following sections and appendices:

- **Executive Summary**

  Provides information to meet Element H- Additional State Requirements. Provides general history and background for Wales, including historical trends for population, the demographic and economic conditions that have shaped the area, as well as the government and leadership within the community. Lists hazards that impact the planning area, critical facilities, and prioritized Mitigation Action Plan (MAP).

- **Section 1- Introduction and Background**

  Defines what a hazard mitigation plan is and its purpose.

- **Section 2- Planning Process**

  Describes the planning process for the MJHMP, identifies Planning Team members, lists the meetings held as part of the planning process, and lists the key collaborators within the surrounding area. This section documents public outreach activities performed by the Tribe and City (support documents are in Appendix D); including document reviews and relevant plans, reports, and other appropriate information data utilized for MJHMP development.

- **Section 3- Risk Assessment/Hazard Analysis/Summary of Vulnerability**

  Describes the process through which the Planning Team identified, screened, and selected the hazards for profiling in this MJHMP. The hazard analysis includes the nature of the hazard, previous occurrences (history), location, extent, and impact of past events, and future event recurrence probability for each hazard. The influence of climate change is also discussed within each hazard profile.

Identifies the Tribe's and City's potentially vulnerable assets—people, critical facilities, critical infrastructure, and residential and non-residential buildings (where available). The resulting information identifies the full range of hazards that the community could face and the potential damages, economic losses, and social impacts. Land use and development trends are also discussed.

- **Section 4- Mitigation Strategy**

  Defines the Tribe's and City's mitigation strategy which provides a blueprint for reducing the potential losses identified in the vulnerability analysis. This section lists the community's policies, programs, available resources, and governmental authorities.

  The Planning Team developed a list of specific mitigation goals and potential actions to address the risks facing Wales. Mitigation actions include structural projects, emergency services, natural resource protection strategies, property protection techniques, preventive initiatives, and public information and awareness activities.

- **Section 5- Plan Maintenance**

  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 Tribe and City's 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, actions that the Tribe and City plans to implement to assure continued public participation, and their methods and schedule for keeping the plan current.

- **Section 6- Plan Update**

  This section describes hazard events that have occurred and changes in development, changes in mitigation priorities, and describes how the mitigation plan was integrated into other planning mechanisms.

- **Section 7- Plan Adoption**

  Describes the Tribe's and City's adoption process of the MJHMP. Supporting documentation can be found in Appendix C.

- **Section 8- References**

  Lists reference materials and resources used to prepare this MJHMP.

- **Section 9- Appendices**

  Appendix A: Delineates federal, state, and other potential mitigation funding sources. This section will aid the Tribe and City with researching and applying for funds to implement their mitigation strategy.

  Appendix B: Provides the FEMA Tribal and Local Mitigation Plan Review Tool, which documents compliance with FEMA criteria.

  Appendix C: Provides the Tribe's and City's adoption resolutions.

  Appendix D: Provides public outreach information, including newsletters and survey.

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 develop this MJHMP. Meeting information regarding the Planning Team and public outreach efforts are included below and outreach support documents are provided in Appendix D.

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

Regulation Checklist- 44 Code of Federal Regulations (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)]
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)]
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)]
A4. Does the plan describe the review and incorporation of existing plans, studies, and reports? [44 CFR § 201.7(c)(1)(iii)]
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)

Regulation Checklist- 44 § 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))
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?
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?
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))
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?
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))
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?
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))
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 2022 (Local)

2.1 OVERVIEW

In 2021, Kawerak Inc. (Kawerak) received a project grant from Bureau of Indian Affairs to fund 10 Tribal Hazard Mitigation Plans in the region. Kawerak contracted Fairweather Science, LLC (Fairweather Science) to facilitate the Plan developments. Kawerak had remaining funding from the BIA grant they received to fund 10 Tribal HMPs, and with the additional funding, Kawerak was able to fund this HMP.

This MJHMP follows the following guidance for mitigation planning:

- FEMA 2019 Tribal Mitigation Planning Handbook, which is a companion to the Tribal Mitigation Plan Review Guide, released by FEMA in 2017
- FEMA 2022/2023 Local Mitigation Planning Policy Guide (Released April 2022, Effective April 2023)
- State of Alaska DHS&EM Element H- Additional State Requirements, Effective April 1, 2024

In 2015, the City of Wales drafted a HMP which was funded by the State of Alaska. This HMP was given APA status by FEMA; however, the City never formally adopted the plan. That plan was used as to inform the development of this HMP.

The planning process began in January 2024 with the Native Village of Wales inviting the City of Wales to participate in the project.

The Kickoff Meeting occurred on February 22, 2024. Representatives from the Tribe, the City of Wales, Kawerak, and Fairweather Science were in attendance. The purpose of this meeting was the discuss the purpose of a HMP, the planning process, expectations, and the project schedule. There was discussion of critical facilities, hazard identification and screening, initial ideas for mitigation projects, and opportunities for public involvement. The Planning Team discussed recent hazard events, including Typhoon Merbok. The Planning Team was tasked with reviewing a preliminary list of critical facilities to make any edits and provide additional information, and to share the survey on social media and post flyers in common places in the community.

On May 21, 2024, the Planning Team met Fairweather Science to discuss the draft risk assessment that they reviewed. The team shared feedback on the draft risk assessment; reviewed and updated the stakeholder notification list; discussed the public notification and involvement process; and set the date for the next meeting to review, select, and prioritize mitigation projects based on the results of the draft risk assessment. The team also discussed Kawerak's deployment of water filters obtained through a Red Cross grant to address drinking water concerns associated with naturally occurring uranium. The filters will provide reverse osmosis, carbon, and UV filtering for every household in Wales.

On May 30, 2024, the draft risk assessment was made available for public and collaborator review. The notification was published on Kawerak's Emergency Preparedness website, Kawerak Facebook page, and through a Kawerak email blast on May 31, 2024. The public was also notified through the Wales community Facebook group.

The following feedback was received on the draft risk assessment:

- Walter Rose from the Bering Straits Regional Housing Authority (BSRHA) provided comments on BSRHA's construction efforts in Wales, historical impacts to BSRHA construction equipment and efforts from severe weather, including Typhoon Merbok, importance of maintaining the road to Tin City, strategic location of Wales in regards to military efforts, provided a link to the NREL high wind penetration study in Wales, and suggested mitigation actions. All comments were incorporated into the final MJHMP.

- David Matthews from HUD's Anchorage Field Office provided information on federal funding mechanisms to implement mitigation actions, suggested that a designated shelter(s) be identified in the critical facilities inventory, and reemphasized the importance of documenting potential impacts from permafrost degradation. All comments were incorporated into the final MJHMP.

On June 10, 2024 the Planning Team met to review, select, and prioritize mitigation projects. Projects were developed through the findings of the risk assessment, suggestions from the Planning Team and collaborators, and other relevant community planning documents.

After the mitigation strategy meeting on June 10th, the Planning Team requested to hold a public meeting at the Tribal office in Wales, with an option to join the meeting virtually. The purpose of this meeting was to solicit input on the draft risk assessment and mitigation actions from elders in the community and those who do not have access to the internet. Flyers were shared on the community Facebook page as well as hung up in the community. The Planning Team also called elders in the community and invited them to the meeting. This community meeting was held on June 13, 2024.

In summary, the following five-step process took place from January 2024 through September 2024.

1. Organize resources: members of the Planning Team identified resources needed in the development of the hazard mitigation plan update- including staff, agencies, and local community members who could provide technical expertise and historical information.
2. Assess risks: with the assistance of a hazard mitigation planning consultant (Fairweather Science), the Planning Team identified the hazards specific to Wales and the consultant developed the risk assessment for the identified hazards. The Planning Team reviewed the risk assessment prior to and during the development of the mitigation strategy.
3. Assess capabilities: the Planning Team reviewed current capabilities to determine whether existing provisions and requirements adequately addressed relevant hazards. Examples of these capabilities are administrative and technical, legal, and regulatory, and fiscal.
4. Develop a mitigation strategy: after reviewing the risks posed by each defined hazard, the Planning Team developed a comprehensive range of potential mitigation goals and actions. The Planning Team then identified and prioritized the actions for implementation.
5. Monitor, evaluate, and update the Plan: the Planning Team developed a process to monitor the plan to ensure it was used as intended while fulfilling the needs of the community. The team then developed a process to evaluate the plan to compare how their decisions affected recognized hazard impacts. The Team then outlined a method to share their successes with members of the community. By sharing their successes, the team aimed to encourage support for mitigation activities and to provide data for incorporating mitigation actions into existing planning mechanisms and to provide data for the plans five-year update.

Table 2 describes Planning Team meetings convened to develop this MJHMP.

Table 2- Hazard Mitigation Planning Team Meetings

Date	Agenda	Attendees	
02/22/2024	Project Kickoff Meeting. MJHMP overview; project schedule; roles and responsibilities, review a list of hazards; initial suggestions for mitigation projects; current critical facilities; discussion about community input via an online survey.	Wales Planning Team	Anna Oxereok (Tribe) Stanley Milligrock (City) Brian Weyaput (City)
		Kawerak, Inc.	Kevin Knowlton
		Fairweather Science	Laura Young Olivia Kavanaugh
05/21/2024	Review of Draft Risk Assessment	Wales Planning Team	Anna Oxereok (Tribe) Stanley Milligrock (City) Brian Weyaput (City)

Date	Agenda	Attendees	
	Review of draft risk assessment and comments from Planning Team, confirm list of collaborators, methods for public notification of availability of draft risk assessment.	Kawerak, Inc.	Kevin Knowlton
		Fairweather Science	Laura Young Olivia Kavanaugh
06/10/2024	Mitigation Strategy Review and prioritize a list of proposed mitigation actions.	Wales Planning Team	Anna Oxereok (NVOW) Stanley Milligrock (COW) Brian Weyaput (COW)
		Kawerak, Inc.	Carol Piscoya
		Fairweather Science	Laura Young Olivia Kavanaugh
06/13/2024	Community Meeting- Review Draft RA After the mitigation strategy meeting on June 10th, the Planning Team requested to hold a public meeting at the Tribal office in Wales, with an option to join the meeting virtually. The purpose of this meeting was to solicit input on the draft risk assessment and mitigation actions from elders in the community and those who do not have access to the internet. Flyers were shared on the community Facebook page as well as hung up in the community. The Planning Team also called elders in the community and invited them to the meeting.	Wales Planning Team	Anna Oxereok (NVOW) Stanley Milligrock (COW) Brian Weyaput (COW)
		Elders and members of the community	Metrona Mazonna (WNC) Larry Seveadlook (WNC) Clifford Seetook (NVOW and Elder) Alexander Okpealuk (public)
		Fairweather Science	Laura Young Olivia Kavanaugh
XX/XX/2024	Review of Draft HMP Review of draft HMP and comments from Planning Team, discuss final steps of the project, discuss plan adoption.	Wales Planning Team	Anna Oxereok (Tribe) Stanley Milligrock (City) Brian Weyaput (City)
		Kawerak, Inc.	Kevin Knowlton
		Fairweather Science	Laura Young Olivia Kavanaugh

NVOW: Native Village of Wales, COW: City of Wales, WNC: Wales Native Corporation

2.2 HAZARD MITIGATION PLANNING TEAM

Table 3 identifies the complete hazard mitigation Planning Team.

Table 3- Hazard Mitigation Planning Team

Name	Title	Organization	Key Input
Anna Oxereok	Tribal Council President	Native Village of Wales	Planning team lead, data input, and MJHMP review.
Marissa Oxereok	Tribal Council Vice President	Native Village of Wales	Planning team member, data input, and MJHMP review.
Stanley Milligrock	Vice Mayor	City of Wales	Planning team member, data input, and MJHMP review.
Brian Weyapuk	Council Member	City of Wales	Planning team member, data input, and MJHMP review.
Kevin Knowlton	Emergency Preparedness Specialist	Kawerak, Inc.	Project Manager, responsible for project coordination.

Table 3- Hazard Mitigation Planning Team

Name	Title	Organization	Key Input
Laura Young	Project Manager, Hazard Mitigation Planner	Fairweather Science, LLC	Responsible for project management/ coordination, subject matter expertise in plan development, and MJHMP review.
Olivia Kavanaugh	Staff Scientist, Hazard Mitigation Planner	Fairweather Science, LLC	Responsible for MJHMP development, writer, research, and data analysis.

2.3 OPPORTUNITIES FOR COLLABORATORS AND OTHER INTERESTED PARTIES TO PARTICIPATE

Fairweather Science extended an invitation to all individuals and entities identified on the project mailing list in which they described the planning process and announced the upcoming communities' planning activities. The announcement was emailed to relevant academia, nonprofits, and local, state, and federal agencies on May 30, 2024.

Wales is a rural Alaska village and does not have any typical neighboring communities. However, the Planning Team invited the following communities to participate in the planning process as Wales relies on them for resources after a hazard event: Nome, Diomede, Shishmaref, and Brevig Mission.

- Alaska Department of Community, Commerce, and Economic Development (DCCED)
  - DCCED, Division of Community and Regional Affairs (DCRA)
  - DCCED, National Flood Insurance Program (NFIP)
  - DCCED, Risk Mapping, Assessment and Planning (Risk MAP)
- Alaska Department of Environmental Conservation (DEC)
  - DEC, Division of Spill Prevention and Response (DSPR)
- Alaska Department of Fish and Game (ADF&G)
- Alaska Department of Health and Social Services (DHSS)
- Alaska Department of Military and Veterans Affairs (DMVA)
  - DMVA, Division of Homeland Security and Emergency Management (DHS&EM)
    - DHS&EM All-Hazards Resilience Programs
    - DHS&EM Community Planning Programs
    - DHS&EM Mitigation Section
- Alaska Department of Natural Resources (DNR)
  - DNR, Division of Forestry (DOF)
  - DNR, Division of Geological and Geophysical Surveys (DGGS)
    - DGGS, Coastal Hazards
    - DGGS, Earthquake and Tsunami Hazards
    - DGGS, Geology
  - DNR, Mining, Land, and Water (MLW)
- Alaska Department of Public Safety (DPS)
- Alaska Department of Transportation and Public Facilities (DOT&PF)
  - DOT&PF Northern Region
- Alaska Native Tribal Health Consortium-Community Development (ANTHC)

- Alaska State Troopers
  - C Detachment, Nome Post
- Alaska Village Electric Cooperative (AVEC)
- American Red Cross of Alaska- Disaster Program Manager
- Arctic Transportation Services
- Bering Strait School District (BSSD)
- Bering Straits Native Corporation (BSNC)
  - BSNC, Bering Straits Development Company
- Bering Straits Regional Housing Authority (BSRHA)
- Denali Commission
- Donny Olson- State Senator (Western Alaska)
- FEMA Region 10 (RX)
  - RX, Alaska Community Planner
  - RX, Tribal Relations Specialist
  - RX, Senior Environmental Protection Specialist
- National Oceanic and Atmospheric Administration (NOAA)
  - NOAA, National Weather Service (NWS)
    - NWS Northern Region
  - NOAA, Regional Preparedness
- Neighboring Communities
  - Nome (City)
  - Diomede (City and Tribe)
  - Shishmaref (City and Tribe)
  - Brevig Mission (City and Tribe)
  - Teller (City and Tribe)
  - Mary's Igloo (Tribe)
  - Fairbanks- Emergency Manager
  - Anchorage- Emergency Manager
- Neil Foster- Alaska State Representative (Nome)
- Norton Sound Economic Development Corporation (NSEDC)
- Norton Sound Health Corporation (NSHC)
- Rural Alaska Community Action Program, Inc. (RurAL CAP)
- University of Alaska Fairbanks (UAF)
  - UAF, Alaska Center for Climate Assessment and Policy (ACCAP)
  - UAF, Alaska Earthquake Information Center (AEC)
  - UAF, Alaska Volcano Observatory (AVO)
  - UAF, Geophysical Institute (GI)
  - UAF, Scenarios Network for Alaska + Arctic Planning (SNAP)
- US Army Corps of Engineers, Alaska Region (USACE)
  - USACE, Alaska Region

- US Coast Guard- Search and Rescue
- US Department of Agriculture (USDA)
  - USDA, Division of Rural Development (RD)
  - USDA, Forest Service (USFS)
  - USDA, Natural Resources Conservation Service (NRCS)
- US Department of Housing and Urban Development (HUD)
  - HUD, Anchorage Field Office
- US Department of the Interior (DOI)
  - DOI, Bureau of Indian Affairs (BIA)
    - BIA, Tribal Climate Resilience
    - BIA, Tribal Operations
  - DOI, Bureau of Land Management (BLM)
    - BLM, Alaska State Office
  - DOI, National Park Service (NPS)
- US Environmental Protection Agency (EPA)
  - EPA, Alaska Native Village Programs
- US Fish & Wildlife Service (USFWS)
  - USFWS, Alaska Region
- US Geological Survey (USGS)
  - USGS, Alaska Science Center
- Wales Native Corporation

2.4 PUBLIC INVOLVEMENT AND TRIBAL DEFINITION OF MEMBERSHIP

The Tribe defines their tribal population as all tribally enrolled members through direct lineage. However, for the purposes of public engagement for this HMP, the Tribe defines "public" as anyone who is a Tribal member (living in or outside of Wales) as well as anyone who lives in Wales. This assures that anyone within the community is eligible to attend and participate in public tribal meetings regarding hazard mitigation plan development and implementation activities.

The Planning Team identified their underserved/vulnerable populations as the community Elders. This group was engaged in the planning process through posting flyers in the community regarding project meetings and public review periods, as many Elders are not engaged on social media. Additionally, the Planning Team held a community meeting on June 13, 2024, at the Tribal office to provide the Elders and other community members, including the Native Corporation, an opportunity to review the draft risk assessment, provide comments, and suggest mitigation projects. The Planning Team recognizes the importance of the Elders' knowledge on natural hazards, including historical conditions and events.

The public was encouraged to provide input regarding local hazards and ideas for mitigation projects via an online survey. The link to the survey was available Kawerak's homepage as well as on the Wales Facebook page.

The Tribe and the City provided notification to the public via the Facebook page and individual notifications to community members, particularly elders and those without social media regarding the project and invited them to participate at a community presentation during the review of the draft risk assessment on June 13, 2024.

Several notifications discussing the hazard mitigation planning process, requesting public input, and to notify the public of the availability of the Draft Risk Assessment and Draft MJHMP were shared with members of the community. The notifications were posted on the Kawerak website and Facebook pages, as well as on the Wales Facebook page as well as sent via email to project collaborators and the project email distribution list.

Feedback received from the public was used in confirming natural hazards that impact Wales, level of concern of each hazard, and critical facilities that the public relies on. Additionally, the Planning Team reviewed the list of mitigation projects that the public suggested during the mitigation strategy meeting.

Outreach support documents are provided in Appendix D.

2.5 REVIEW AND INCORPORATION OF EXISTING PLANS, STUDIES, AND REPORTS

During the development of this MJHMP, Fairweather Science and the Planning Team reviewed and incorporated pertinent information from available resources into the document. Data included available plans, studies, reports, and technical research, which is listed in Table 4. The data was reviewed and referenced throughout the document.

Table 4- Documents Reviewed

Existing plans, studies, reports, ordinances, etc.	Contents Summary (How will this information improve mitigation planning?)	Data Used (How was this information incorporated into this MJHMP?)
2023 State of Alaska Hazard Mitigation Plan (SHMP)	Defines statewide hazards and their potential locational impacts.	Compared hazard profiles, history, and impacts of events for risk assessment.
2015 City of Wales HMP (not adopted)	Defines hazards, resources, and mitigation projects for Wales in 2015.	Compared hazard profiles, history, and impacts of events for risk assessment, list of critical facilities, and list of mitigation projects.
Other regional HMPs: Diomede MJHMP (2023), Brevig Mission MJHMP (2023), Teller THMP (2023)	Defines hazards, resources, and mitigation projects for communities in the area.	Compared hazard profiles, history, and impacts of events for risk assessment.
2007 USACE Erosion Information Paper- Wales, Alaska	Baseline erosion assessment of the community.	Used to describe historical erosion locations and impacts in Wales.
Shoreline Change in Wales (1950-2012)	Map of erosion locations and rate of erosion in Wales from 1950-2012.	Used map in erosion hazard profile to discuss extent and rate of erosion.
2017 Floodplain Manager's Report- Wales	Provides details on historic flood events in the community and approximates the 100-year (1% chance) floodplain	Used to determine the 100-year (1% chance) floodplain for facilitates at risk of flooding.
Erosion Exposure Assessment- Wales	This is a summary of results from an erosion forecast near infrastructure at Wales, Alaska. DGGS scientists conducted a shoreline change analysis, forecasted 60 years of erosion, and estimates the replacement cost of infrastructure in Wales.	Report was used in the erosion hazard profile to determine severity of erosion, future impacts, and infrastructure threatened by erosion.
2019 Denali Commission Statewide Threat Assessment	Determines and ranks individual communities and infrastructure on their risk level by erosion, flooding, and thawing permafrost.	Used group classification rankings in flooding, erosion, and permafrost degradation hazard profiles.

Table 4- Documents Reviewed

Existing plans, studies, reports, ordinances, etc.	Contents Summary (How will this information improve mitigation planning?)	Data Used (How was this information incorporated into this MJHMP?)
2018 National Climate Assessment	Assesses the science of climate change and variability and its impacts across the U.S., now and throughout the century.	Assessment cited several times in hazard sections describing how climate change will influence future conditions.
UAF/SNAP Database	Provides historical data and future projections on climate change impacts, wildfire danger, and other applicable hazards.	Cited several figures and other data in hazard profiles.
October 2022 DHS&EM Disaster Cost Index	Provides details for historic statewide disasters.	Incorporated relevant disaster descriptions in each applicable hazard profile to strengthen the hazard history, extent, and impact sections.
Wales Local Economic Development Plan (2004-2009 and 2011-2016)	Describes the economic development program of Wales and charts the course of action over a five-year time period.	Reviewed during plan development and incorporated information into relevant sections as applicable.

A complete list of references in provided in Section 8.

2.6 OTHER ONGOING TRIBAL EFFORTS

Once the 2024 MJHMP is completed, the Native Village of Wales intends to apply for available Hazard Mitigation Assistance Grant funding and will work closely with the FEMA Region X Tribal Liaison in doing so. In addition, on completion of the 2024 MJHMP, information will be incorporated into future planning efforts and the creation of Tribal plans as well as other FEMA programs and initiatives.

Other agency efforts in Wales include:

- Kawerak Transportation's continued efforts to update the Long-Range Transportation Plan
- Bering Straits Regional Housing Authority's continue efforts to build new residential housing, and in some communities, relocate housing out of hazard areas.
- ANTHC's ongoing efforts to upgrade and replace critical water and wastewater infrastructure
- Ongoing efforts to upgrade and replace critical power infrastructure
- Kawerak Emergency Management's ongoing efforts to provide water purification systems for safe drinking water and emergency food supplies to address food security concerns for residents

3. RISK ASSESSMENT/HAZARD ANALYSIS

This section identifies and profiles the hazards that could affect Wales.

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

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)] 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)] B3. Does the plan include a description of each identified hazard's impact, as well as an overall summary of the vulnerability of the tribal planning area? [44 CFR § 201.7(c)(2)(ii)]
Source: FEMA 2017 (Tribal)

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)) 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? B1-b. Does the plan include information on the location of each identified hazard? B1-c. Does the plan describe the extent for each identified hazard? B1-d. Does the plan include the history of previous hazard events for each identified hazard? B1-e. Does the plan include the probability of future events for each identified hazard? Does the plan describe the effects of future conditions, including climate change (e.g., long-term weather patterns, average temperature, and sea levels), on the type, location, and range of anticipated intensities of identified hazards? 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 2022 (Local)

3.1 OVERVIEW

Hazard identification is the process of recognizing any natural events that may threaten an area. Natural hazards result from uncontrollable or unexpected natural events of sufficient magnitude. This plan does not take in account any man-made, technological, or terrorism related hazards. Historical hazards are noted, but all natural hazards that have the potential to affect the study area must be considered. Any hazards that are determined to be unlikely to occur or cause little to no damage, are eliminated from consideration.

A hazard analysis includes the identification, screening, and profiling of each hazard.

Hazard profiling entails describing hazards in terms of their nature, history, location, magnitude, frequency, extent, and probability. Hazards are identified through historical and anecdotal information collected by members of the community, previous mitigation plans, studies, and study area hazard map preparations/reviews, when appropriate. Hazard maps are then used to define the geographic extent of a hazard, as well as define the approximate boundaries of the risk area.

3.2 HAZARD IDENTIFICATION AND SCREENING

On February 22, 2024, the Planning Team evaluated and screened the comprehensive list of potential hazards that could impact the community. The Planning Team determined that nine hazards pose a threat to Wales: earthquake, severe weather, wildland/tundra fire, changes in the cryosphere, naturally occurring uranium, flood, tsunami, erosion, and landslide. The influence of climate change is discussed within each individual hazard profile.

The Native Village and City of Wales are located in the same geographic area and thus experience the same vulnerability to hazards.

The assets at risk of the identified hazards, both within and outside of the planning area, are identified in Section 3.4.6.

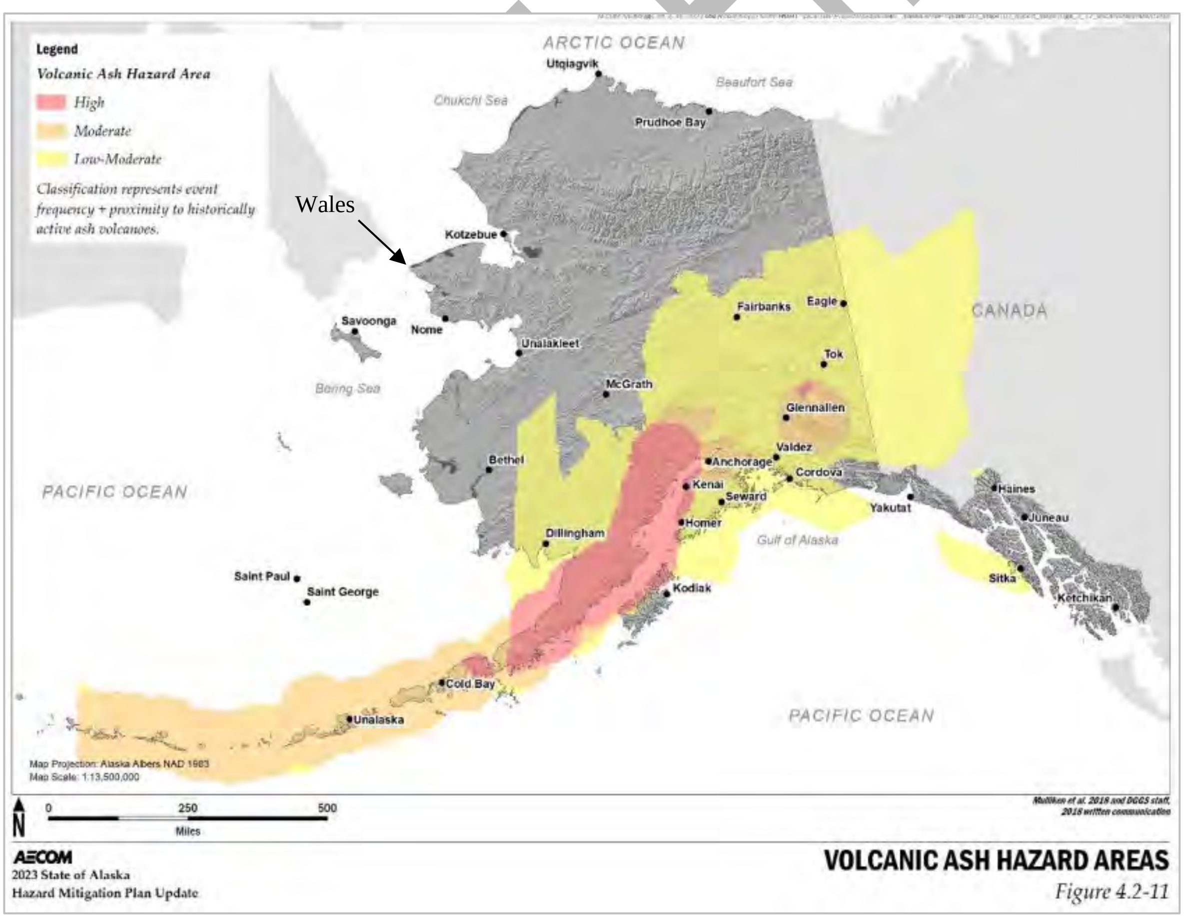
Table 5- Identification and Screening of Hazards

Hazard Type	Explanation
Earthquake	Wales is not located near the Aleutian Subduction zone and historical earthquakes have been minor and fewer in number compared to areas along the subduction zone and the rest of the state. There are Pre-Quaternary faults (not active in over 1.6 million years) near Wales, but they are not named. Wales has not been historically severely impacted by earthquakes. The extent of damage is occasional cabinets being opened and slight shaking.
Severe Weather (Cold, Drought, Rain, Snow, Wind, etc.)	Wales experiences severe weather events such as the following: extreme cold, freezing rain/ice storms, heavy and drifting snow, winter storms, blizzards, heavy rain, high winds, and droughts.
Wildland/Tundra Fire	Wales is located in the EC5 Level II Ecoregion which is classified as Bering Tundra. The Seward Peninsula is a predominantly treeless region and the vegetation/landcover class of this region is primarily made up of sparse vegetation containing trees, shrubs, and herbaceous cover. Ecoregion EC5 has a low fire load, but fires do happen under favorable conditions. Mainly short lived as moisture frequently impacts the west coast. However, with certain combinations of fuel availability, weather, topography, and sources of ignition, wildland fires may occur near Wales. Wales is occasionally impacted by smoke from distant wildfires that impacts their air quality.
Changes in the Cryosphere	Hazards associated with permafrost degradation, sea ice extent, and snow avalanches occur in Wales. Wales has historically had continuous permafrost. Thawing permafrost has led to subsidence and heaving on subsistence trails, roads and underneath some homes. Sea ice in the Bering Sea has been declining and has impacted the community's subsistence lifestyle. An avalanche in the early 1900s resulted in a fatality in the community.
Naturally Occurring Uranium	A uranium deposit discovered in 1977 in western Alaska, by means of airborne radiometric data, is the largest known in Alaska on the basis of industry reserve estimates. The major radioactive minerals in placer concentrations from the Cape Mountain area in the western Seward Peninsula are monazite, xenotime, and zircon. The source of the radioactive minerals is likely the granite at Cape Mountain, although they may be genetically related to the tin deposits in the area. Wales regularly tests their drinking water for levels of uranium.
Flood	Wales is located on the coastline and experiences coastal flooding associated with Bering Sea storms. Wales is not threatened by riverine flooding, but a creek near the Village does occasionally overtop due to heavy rain or storms. The Denali Commission 2019 Statewide Threat Assessment provides statewide risk ratings for flooding. Wales is located in Group 3, which are the communities that are least threatened by flooding.
Tsunami	There has never been a tsunami observed in Wales, but members of the Planning Team recall that when they were young, they prepared for a tsunami following an earthquake and went to higher ground, but no tsunami came. Wales does not have inundation mapping to determine if/how a tsunami would impact the community. Until mapping can be done, the Planning Team wanted to profile the hazard.

Hazard Type	Explanation
Erosion	Wales is located on the coastline and experiences coastal erosion associated with Bering Sea storms. From 1950-2012, Wales was losing approximately 5.6 feet of shoreline per year. Facilities in Wales have been impacted by erosion including the school, old church, clinic, washeteria, teacher housing, 4 homes, the cemetery, and subsistence trails.
Landslide	Landslides may occur on Cape Mountain, 3 miles SE of the community. The mountain has granite formations that are massive and jointed.
Climate Change	The Planning Team chose to incorporate the influence of climate change into each hazard rather than profiling it as a standalone hazard. In Wales, average annual temperatures may increase by about 14ºF by the end of the century while winter temperatures are increasing the most (+25ºF) (UAF/SNAP 2024a- Northern Climate Reports). Winter is likely to have +53% more precipitation and by the late century, permafrost within about 10ft of the ground surface may completely disappear (UAF/SNAP 2024a- Northern Climate Reports).

3.2.1 HAZARDS NOT PROFILED IN THIS MJHMP

- **<u>Volcano</u>:** The 2023 State of Alaska SHMP identifies volcanic ash hazard areas across the State (Figure 4). Wales is not located near any active volcanoes and volcanic ash does not pose a direct threat to the community. Wales may be indirectly impacted by a future volcanic eruption as travel/supplies may be delayed from Nome, Anchorage or Seattle if planes are not permitted to travel due to ash or other volcanic hazards.



Source: DHS&EM 2023

Figure 4- Statewide Volcanic Ash Hazard Areas

3.3 HAZARD PROFILES

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

- Nature (type)
- History (previous occurrences)
- Location (where the hazard occurs in the Planning Area)
- Extent (includes magnitude and severity)
- Impact (provides general impacts associated with each hazard)
- Probability of Future Events (annual likelihood of hazard occurring in the Planning Area)
- Future Conditions Including Climate Change (how climate change is influencing the hazard)

Each hazard is assigned a rating based on the following criteria for magnitude/severity (Table 6) and probability of future event (Table 7). Estimating magnitude and severity are determined based on historic events using the criteria identified in the following tables.

Table 6- Hazard Magnitude/Severity Criteria

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

Table 7- Hazard Probability of Future Events Criteria

Probability	Criteria
4- Highly Likely	• Event is probable within the calendar year. • Event has up to 1 in 1 year chance of occurring (1/1=100%). • History of events is greater than 33% likely per year.
3- Likely	• Event is probable within the next three years. • Event has up to 1 in 3 years chance of occurring (1/3=33%). • 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. • Event has up to 1 in 5 years chance of occurring (1/5=20%).

Probability	Criteria
	• 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. • Event has up to 1 in 10 years chance of occurring (1/10=10%). • History of events is less than or equal to 10% likely per year.

The hazards profiled for the Native Village and City Wales are presented throughout the remainder of this section. The presentation order does not signify their importance or risk level.

3.3.0 CLIMATE CHANGE

To meet updated FEMA guidelines, the Planning Team decided to incorporate the influence of climate change into each individual hazard rather than profile it as standalone hazard. General background information regarding climate change in Alaska, with emphasis on Western Alaska/Arctic region, is described below and the specific influences are described in each hazard section.

Nature

Climate change is the long-term variation in Earth's average weather patterns and atmospheric composition. These variations may be natural, but since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels (like coal, oil, and gas) which produce heat-trapping gases. These gases act as a blanket over the Earth, and with more gasses, the thicker the blanket, the warmer the earth. Trees and other plants are not able to absorb the excess carbon dioxide in the atmosphere, and this excess carbon dioxide changes precipitation and temperature patterns. These changes in precipitation patterns lead to increasing frequency and intensity of storms and floods, wildfires, and substantial changes in flora, fauna, fish, and wildlife habitats.

For the past million years the natural climate has oscillated between warm periods and ice ages. This shifting in and out of warm periods and ice ages is correlated strongly with Milankovitch cycles. These cycles affect the amount of sunlight and therefore, energy, that Earth absorbs from the Sun. They provide a strong framework for understanding long-term changes in Earth's climate, but Milankovitch cycles can't explain all climate change that's occurred over the past 2.5 million years. Milankovitch cycles cannot account for the current period of rapid warming Earth has experienced since the pre-Industrial period (years 1850-1900), and particularly since the mid-20th Century. Earth's recent and continual warming is primarily due to human activities- specifically, the direct input of carbon dioxide into Earth's atmosphere from burning fossil fuels. This is significant because hazard mitigation planning relies greatly upon the historical record.

As noted in the 2018 4th National Climate Assessment (USGCRP 2018), the effects of climate change in Alaska will include:

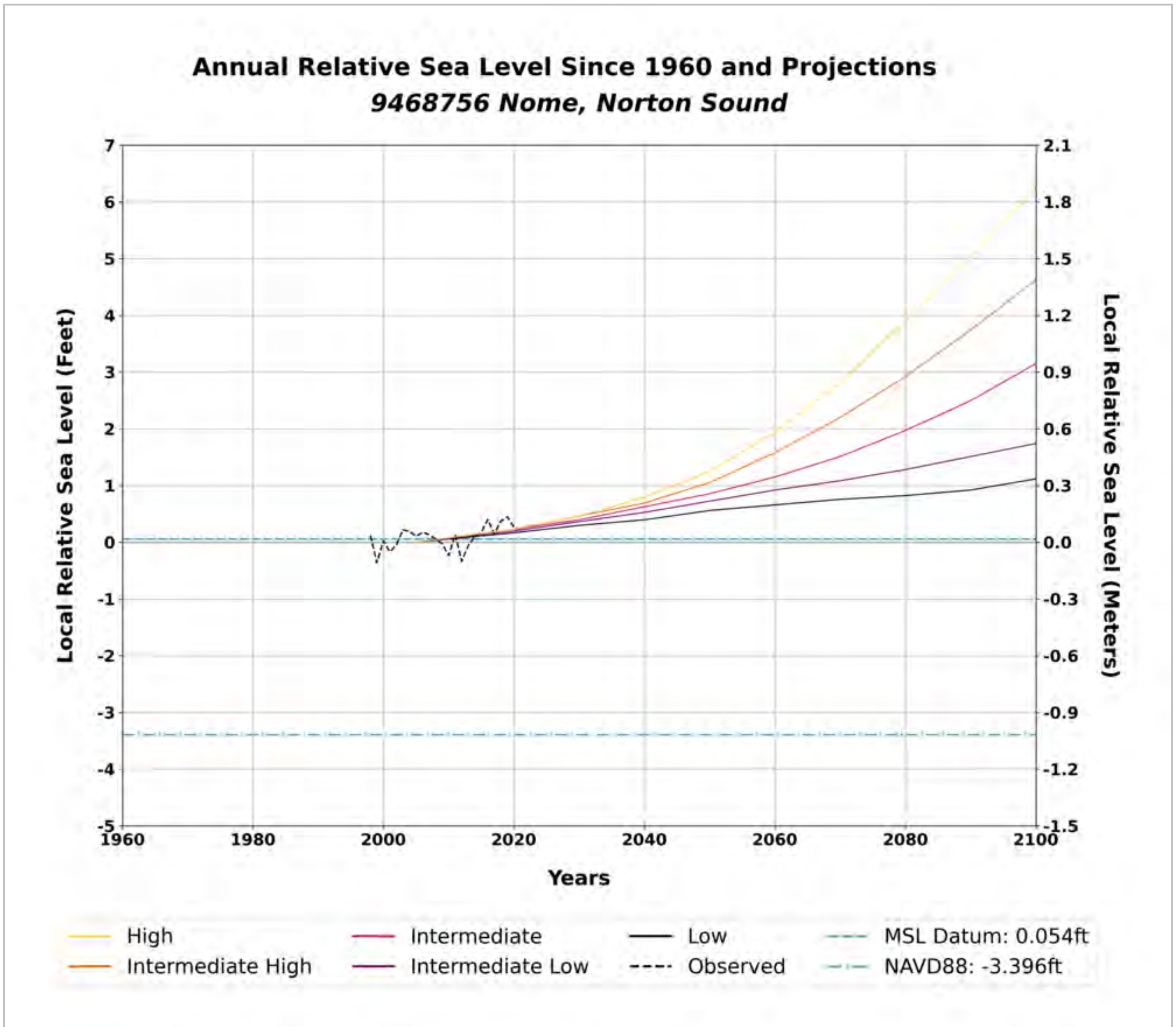
- Increase in ocean acidification which will affect marine habitats.
- Lack of sea ice, which will contribute to increased storm surge and coastal flooding and erosion.
- Increase in the size, intensity, and frequency of wildfires.
- Thawing permafrost, melting glaciers, and the associated effects on the state's infrastructure and hydrology.
- Increase of health threats, such as injuries, smoke inhalation, damage to vital infrastructure, decrease of food and water security, and new infectious diseases.

Location

Alaska has been called a ''climate canary'' because it was one of the first regions to see the early effects of global climate change. Climate researchers expect future climate change in Alaska and other Arctic places to be more pronounced than it is elsewhere in the world (Larsen et al. 2008).

Global sea level has risen between 6 and 8 inches (15-20 cm) over the last 100 years (NOAA 2021). About one third of the increase is due to the thermal expansion of ocean water as it has gotten warmer, and about two-thirds is due to meltwater flowing back to the ocean as glaciers and ice sheets on land melt.

Figure 5 depicts the rising sea level in Nome from 1992 to 2022, which is the closest monitoring station to Wales. In those 30 years, the highest sea level was recorded in February 2019 and the lowest was recorded in March 1994.



Source: NOAA 2022

Figure 5- Annual Relative Sea Level in Nome and Future Projections (1960-2100)

Despite the global nature of climate change, amplified local/regional effects occur and can be significant. The entire community of Wales is vulnerable to climate change.

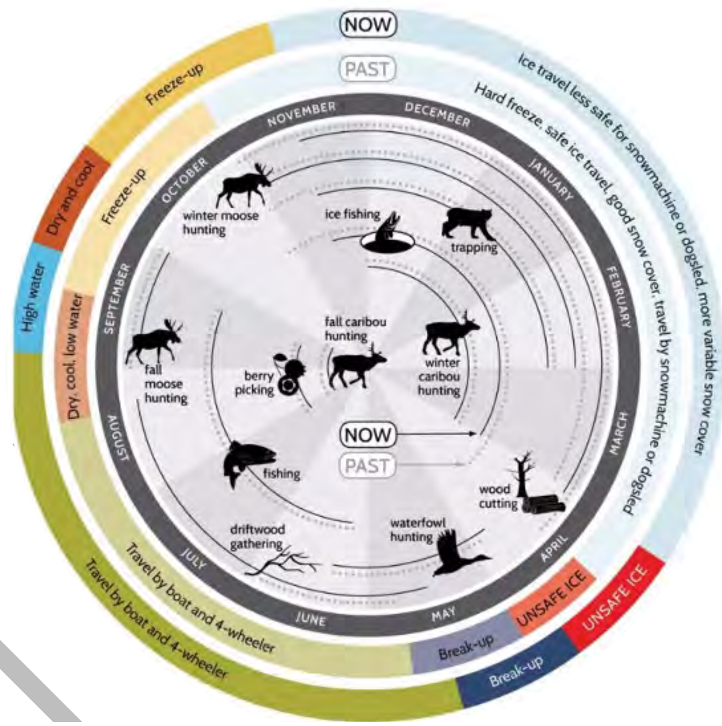
Impact

Climate change in Alaska is causing widespread environmental change that is damaging critical infrastructure, especially in coastal communities. As climate change continues, infrastructure may become more vulnerable to damage, increasing risks to residents and resulting in large economic impacts (Melvin et al. 2016).

It is estimated that climate change in Alaska could add $3.6–$6.1 billion (+10% to +20% above normal wear and tear) to future costs for public infrastructure between 2008 and 2030 and $5.6–$7.6 billion (+10% to +12%) between 2008 and 2080 (Larsen et al. 2008).

Climate change is impacting food security in Alaska, especially that of Indigenous Alaskans who rely on subsistence hunting, fishing, and gathering. Observed greening of tundra biomes and browning of boreal forest biomes is affecting the abundance and distribution of animals such as reindeer and salmon, reducing available harvests of these important subsistence species, and is impacting access to and availability of foraging plants (IPCC 2019).

Ocean acidification is a less commonly discussed impact of climate change in which the pH level of ocean waters decreases due to the absorption of atmospheric carbon dioxide. According to NOAA, the world's oceans have become 30% more acidic since the Industrial Revolution, and as atmospheric CO_2 rises, more of this gas is absorbed by the oceans (NOAA 2020). Ocean acidification has also been shown to disrupt some fish species and their ability to identify suitable habitats and detect predators and can impact the shells and sensory organs of crab. Additionally, ocean warming is impacting available fish stocks, and marine animal biomass is projected to decrease in the 21st century by as much as 6.4% in a low emissions scenario, and 24.1% in a high emissions scenario. Ocean acidification and warming are anticipated to be irreversible on human time scales, indicating that societies will be required to adapt to these changing conditions and reductions of fish availability (IPCC 2019).



Source: Steffen et al. 2021

Figure 6- How Climate Change is Affecting the Timing of Traditional Subsistence Activities

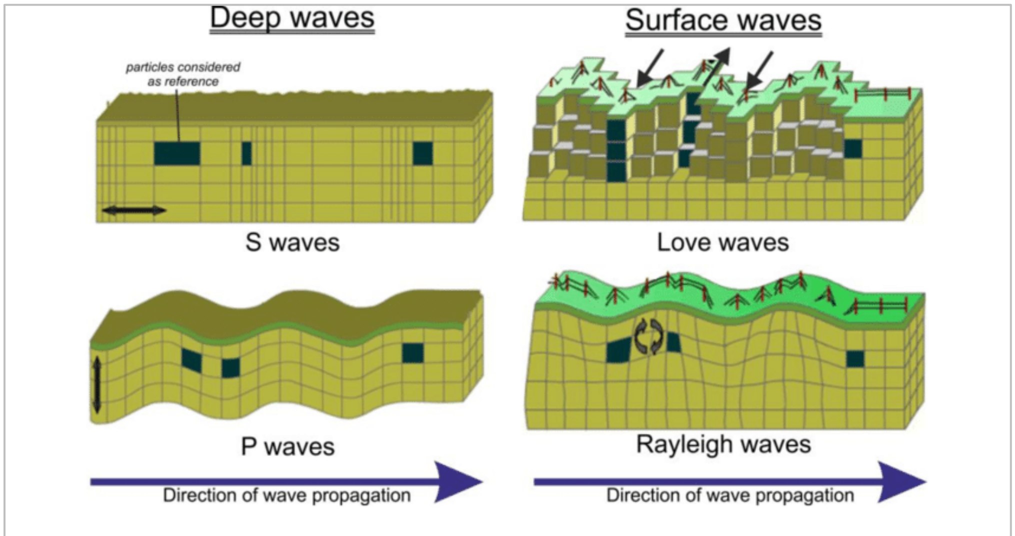
The combined impacts of changes to boreal forest and tundra biomes, ocean acidification, and ocean warming could prove highly disruptive to food security and the economy of Alaska, which relies heavily on subsistence and commercial hunting and fishing. The IPCC's 2019 report concludes that these ecosystem changes will further erode the cultural identities and livelihoods of Indigenous as well as non-Indigenous peoples (IPCC 2019).

3.3.1 EARTHQUAKE

3.3.1.1 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 epicentre, 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.

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 epicentre of the earthquake. An earthquake causes several types of waves both with the Earth's interior (seismic waves) and along the surface of the Earth (surface waves). Two distinct types of seismic 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 (the vertical motion). 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 (horizontal motion). Additionally, there are two types of surface waves: both Rayleigh and Love waves travel more slowly and usually cause considerably less damage than the seismic waves. A visual depiction of each of these waves is shown below (Figure 7).



Source: Martinez-Moreno 2015

Figure 7- Types of Seismic Waves

Besides the motion and resultant damage, there are also several other hazards 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, i.e., as much as 7 meters vertically and more than 60 kilometers along the rupture line. 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 becomes distorted 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 tens 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.

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 severity of 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 8, 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 a given 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 magnitude, intensity, ground-shaking comparisons, perceived shaking, and damage.

Table 8- Magnitude/Intensity/Ground-Shaking Comparisons

Magnitude	Intensity	PGA: Acceleration (g)	Perceived Shaking	Damage
1.0-3.0	I	<0.000464	Not felt	None
3.0-3.9	II-III	0.000464 - 0.00297	Weak	None
4.0-4.9	IV	0.00297 - 0.0276	Light	None
	V	0.0276 - 0.115	Moderate	Very light
5.0-5.9	VI	0.115 - 0.215	Strong	Light
	VII	0.215 - 0.401	Very Strong	Moderate
6.0-6.9	VIII	0.401 - 0.747	Severe	Moderate/Heavy
	IX	0.747 - 1.39	Violent	Heavy
7.0+	X+	>1.39	Extreme	Very Heavy

Adapted from: USGS (2008) and Er et al. (2010)

3.3.1.2 History

Reliable data in the seismology of Alaska has been recorded only since 1973 for most locations, and this makes the data relatively young compared to other areas. Obtained for the U.S. Geological Survey (USGS) and the archives of the UAF Geophysical Institute, State of Alaska, the information provided is based on the best-known data. Thorough research was conducted for all events since 1950 (1950-1972 data is less reliable than current data) and up to the present within the earthquake database of the USGS.

Alaska's strongest earthquake, and the second largest earthquake in the world, occurred on March 27, 1964, in Prince William Sound and was magnitude M9.2. Similar to most earthquakes in Alaska, this one occurred near the Alaska-Aleutian subduction zone and was felt by many residents throughout the State. Wales did not experience any damages from this event.

Another notable earthquake occurred on November 3, 2002. The Denali Fault Earthquake, which measured M7.9 in magnitude, lasted for roughly 90 seconds. The earthquake struck a sparsely populated region, and caused thousands of landslides, but little structural damage and no deaths were reported. Wales did not experience any damages from this event.

Table 9 lists the historical earthquakes M4.0 and greater within 100 miles of Wales. Historical earthquake data was pulled from the USGS Earthquake Catalog from January 1, 1900, through April 25, 2024. Since 1900, there have been 43 recorded earthquakes M4.0 and greater within 100 miles of Wales- the largest occurred on December 28, 1952, and registered as a M5.8.

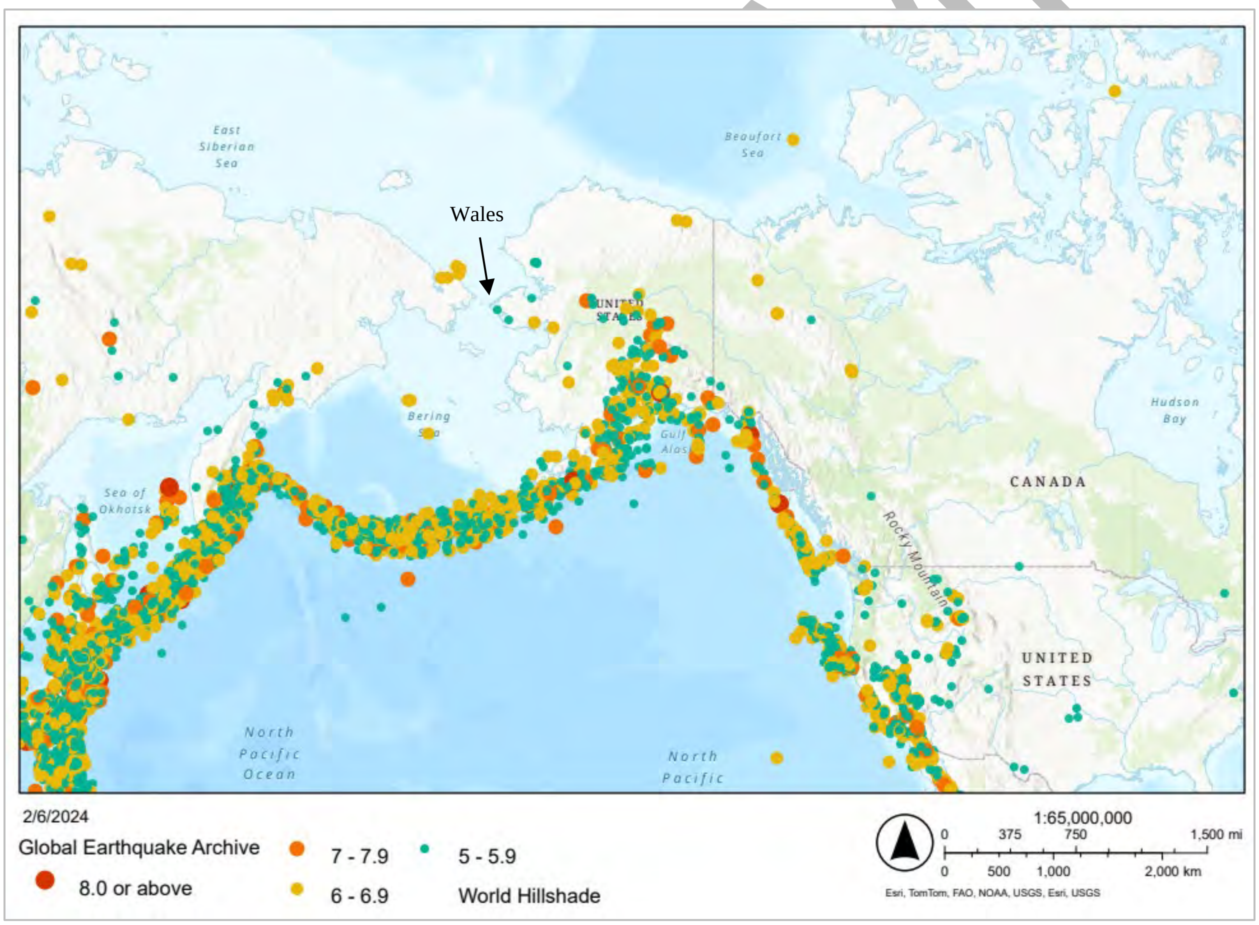
Table 9- Historical Earthquakes (M4.0 and greater within 100 miles of Wales)

Date	Latitude	Longitude	Magnitude
12/28/1952	65.49	-167.209	5.8
12/13/1964	64.948	-165.81	5.6
08/11/1974	66.02	-165.505	4.1
10/24/1979	65.238	-164.736	4.4
01/26/1980	66.079	-168.027	4.5
08/07/1982	65.999	-166.766	4.8
11/04/1983	65.725	-167.941	4.2
04/07/1985	65.016	-166.447	4.2
02/04/1987	65.04	-166.801	4.7
09/11/1988	65.468	-167.837	4.2
08/30/1992	64.7333	-165.627	4.7
08/09/1996	64.926	-169.786	4.9
08/09/1996	65.086	-169.983	5.2
08/09/1996	64.974	-169.855	4.4
08/10/1996	65.066	-169.915	4.1
08/27/1996	65.204	-165.444	4.4
11/03/1996	64.812	-170.481	5.2
11/21/1996	65.01	-170.862	4.2
05/21/1997	65.389	-166.979	4.3
04/04/1999	65.1633	-170.875	4.3
11/25/2000	66.557	-170.283	4.6
10/22/2003	65.4542	-167.446	4.4
09/11/2004	65.8864	-166.21	4.0
07/08/2006	65.9611	-170.149	4.5
07/10/2006	65.773	-169.623	4.9
11/26/2006	65.7929	-170.114	4.2
04/07/2010	65.164	-170.652	4.2
05/13/2010	65.663	-166.691	4.4
05/25/2010	66.4044	-169.837	4.2
08/08/2010	65.3053	-168.107	4.0
11/02/2010	65.395	-169.06	4.4
05/21/2011	65.3739	-166.866	5.0
04/25/2014	65.334	-166.354	4.4
03/17/2015	64.8603	-167.991	4.0

Date	Latitude	Longitude	Magnitude
07/09/2016	65.7005	-166.13	4.8
07/17/2016	65.6862	-166.102	4.2
03/22/2017	65.1993	-169.033	4.2
06/29/2017	65.2778	-168.029	4.1
11/16/2018	65.5781	-166.807	4.6
11/16/2018	65.5676	-166.779	4.2
11/21/2018	65.5734	-166.783	4.0
07/03/2019	65.8176	-166.191	4.1
11/01/2020	65.3927	-168.772	4.6

Source: USGS 2024a

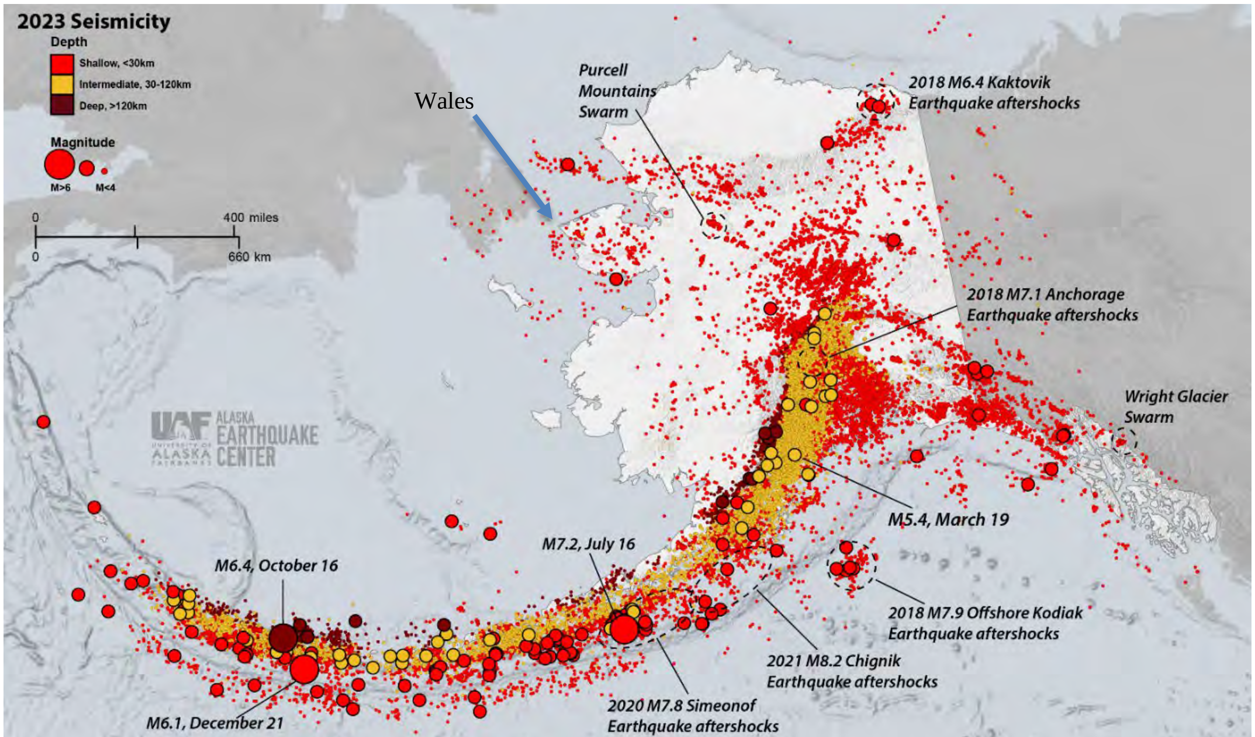
Figure 8 shows historical Alaska earthquakes from 1900 – February 6, 2024, M5.5 and greater.



Source: Global Earthquake Archive- Updated December 11, 2023, Accessed February 6, 2024

Figure 8- Historical Alaska Earthquakes Greater than M5.5, 1900 - February 6, 2024

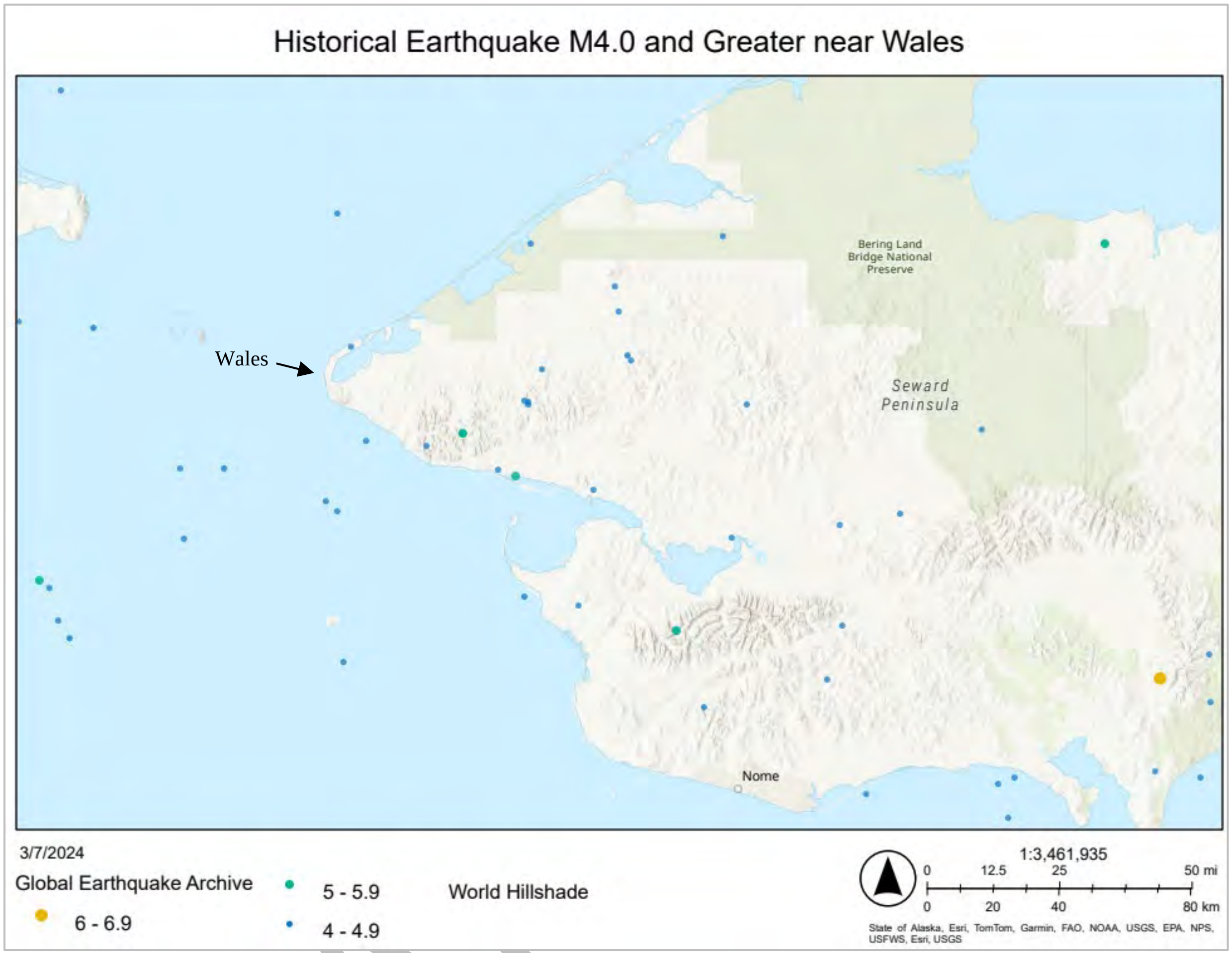
Figure 9 depicts one year of earthquake activity in Alaska during 2023. The Alaska Earthquake Center (AEC) states that "when Alaska has less than 50,000 earthquakes in a given year, we consider it quiet. 2023 was a quiet year for Alaska, with the AEC reporting 45,546 seismic events in Alaska and neighboring regions. This is ~1,500 less than in 2022, and about 8,900 less than the record-breaking 2018" (AEC 2024).



Source: AEC 2024- (Note, there is a lack of seismometers deployed in the northern portion of the state.)

Figure 9- Map of Alaska's Recorded Earthquakes in 2023

Figure 10 depicts historical earthquakes M4.0 and greater near Wales.



Source: Global Earthquake Archive- Updated December 11, 2023, Accessed March 7, 2024

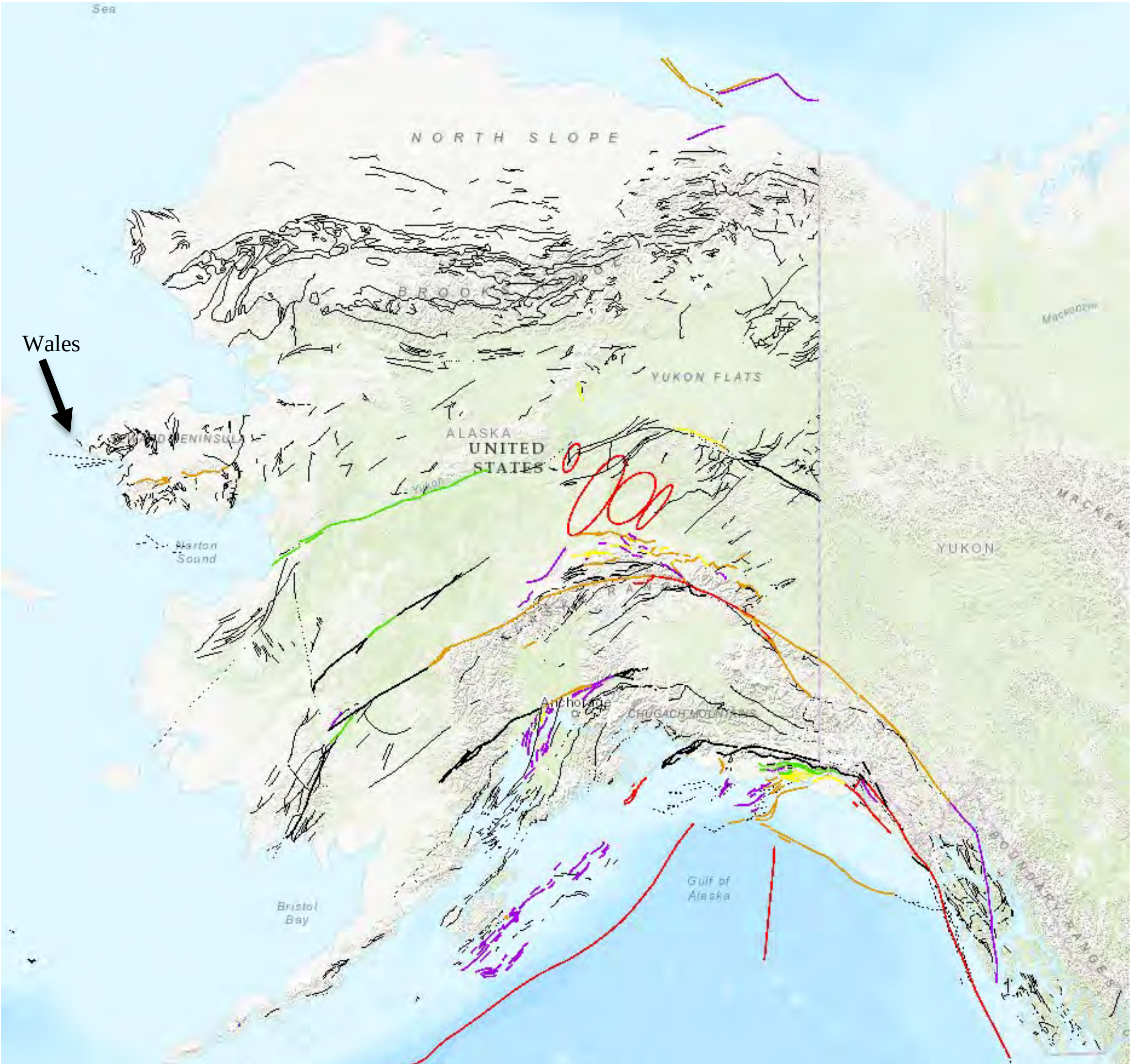
Figure 10- Historical Earthquakes M4.0 and Greater near Wales

Within ~100 miles of Wales, the largest earthquake occurred on August 25, 1950, and registered as a M6.0, but there were no recorded damages in Wales.

3.3.1.3 Location

Due to Alaska's location along the border between two tectonic plates, near the Aleutian Islands, the entire state is subject to the effects of earthquakes. Wales is not located near this subduction zone and historical earthquakes have been minor and fewer in number compared to areas along the subduction zone and the rest of the state.

Figure 11 shows Alaska's earthquake faults and folds. The accompanying legend is below.



Source: DGGS Quaternary Fault and Folds Database (2013)

Figure 11- Alaska's Faults and Folds

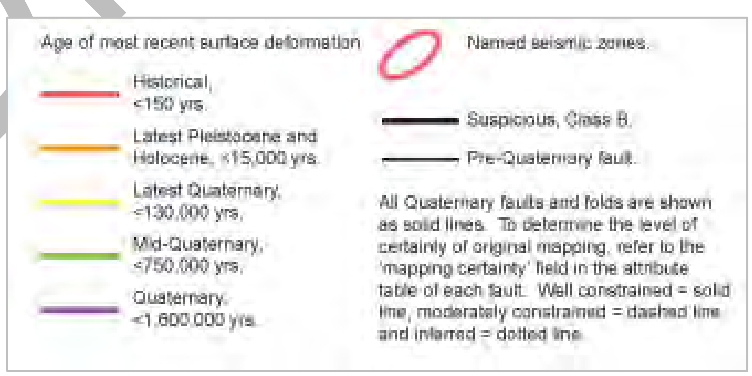


Figure 12 is a zoomed in image of the Quaternary Fault and Folds near Wales. The legend above is applicable to this figure as well.

The faults near Wales are Pre-Quaternary faults (not active in over 1.6 million years) and are not named.

Source: DGGS Quaternary Fault and Folds Database (2013)

Figure 12- Faults and Folds Near Wales

3.3.1.4 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.

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. The Richter scale expresses magnitude as a decimal number.

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 Richter Scale has no upper limit, but for the study of massive earthquakes, the moment magnitude scale is used. The modified Mercalli Intensity Scale is used to describe earthquake effects on structures (Table 8).

Most earthquake injuries and fatalities occur within buildings from collapsing walls and roofs, flying glass, and falling objects. As a result, the extent of Wales' risk depends not just upon its location relative to known faults, 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.

Based on past event history and the criteria identified in Table 6, the extent of earthquakes in Wales is considered Negligible with minor injuries, the potential for critical facilities to be shut down for less than 24 hours, less than 10 percent of property or critical infrastructure being severely damaged.

3.3.1.5 Impact

The Seward Peninsula is not a typically seismically-active area of Alaska, but damages to buildings from past earthquakes have been documented in the region. Impacts from earthquakes pose a larger threat to Wales if a large and damaging earthquake impacts a larger community hub such as Anchorage, and disrupts the supply chain. Rural Alaskan communities rely on food, supply, and freight deliveries from Anchorage and if air travel is disrupted due to an earthquake (or any other hazard event), rural villages would be without food and supplies for extended periods of time.

3.3.1.6 Probability of Future Events

While it is not possible to predict an earthquake, the USGS has developed earthquake probability maps that use the most recent earthquake rate and probability models.

Figure 13 shows the earthquake probability/risk for Wales. This map layer shows the potential ground shaking intensity from earthquakes and the value that is shown is an estimate of the worst amount of shaking due to earthquakes experienced at a specific location in a 50-year time frame (Esri, USGS 2022).

In Wales, the associated earthquake risk category is 9% (0.09g). Based on the MMI scale (Table 8), Wales could experience moderate shaking and very light potential damage.

This layer shows the probability of a 10% chance of exceeding the displayed horizontal ground acceleration within 50 years. A 10% chance in 50 years means that statistically this earthquake happens on average every 500 years.
Source: Esri, USGS- USA Earthquake Risk. Accessed February 6, 2024.

Figure 13- Wales Earthquake Probability/Risk

Based on previous occurrences and the criteria identified in Table 7, it is Likely that there will be an earthquake M4.0 or greater within 100 miles of Wales 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.

3.3.1.7 Future Conditions Including Climate Change

Changing Factor	Description of Future Changes due to Climate Change
Nature	Climate change is unlikely to influence the nature of future earthquakes in Alaska.
Location	Climate change is unlikely to influence the location of future earthquakes in Alaska.
Extent	Climate change is unlikely to influence the extent of future earthquakes in Alaska.
Impact	Climate change is unlikely to influence the impact of future earthquakes in Alaska.
Probability of Future Events	Climate change is unlikely to influence the recurrence probability of future earthquakes in Alaska.
Population Patterns	Climate change is unlikely to influence future earthquakes, including population patterns.
Land Use Development	Climate change is unlikely to influence future earthquakes, including land use development.

3.3.2 SEVERE WEATHER

3.3.2.1 Nature

Severe weather is any dangerous meteorological development that has the power to cause damage or disruption, including the loss of human life. Severe weather instances that occur throughout Alaska with extremes experienced by Wales' residents include extreme cold, freezing rain/ice storm, heavy and drifting snow, blizzard, winter storm, heavy rain, high winds, and drought. The nature of each event is described below.

Severe Weather Event	Nature of the Event
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. In Alaska, extreme cold usually involves temperatures between -20 to -50°F or more.
Freezing Rain and Ice Storms	Freezing rain and ice storms occur when the layer of freezing air is so thin that the raindrops do not have enough time to freeze before reaching the ground. Instead, the water freezes on contact with the surface, creating a coating of ice on whatever the raindrops contact. These events are noted by accumulation of at least 12 inches in less than 24 hours.
Heavy Snow	Heavy snow generally means snowfall accumulating to four inches or more in depth in 12 hours or less or six inches or more in depth in 24 hours or less.

Severe Weather Event	Nature of the Event
Drifting Snow	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.
Blizzard	A blizzard as a specific type of snowstorm that consist of large amounts of snow or blowing snow, winds greater than 35 mph, and visibility of less than ¼ mile for at least three hours.
Winter Storm	A winter storm is a combination of heavy snow, blowing snow, and/or dangerous wind chills. A winter storm is life-threatening. A snowstorm is an example of a winter storm. A snowstorm occurs when a mass of very cold air moves away from the polar region and collides with a warm air mass. The warm air rises quickly and the cold air cuts underneath it, causing huge cloud bank to form. As the ice crystals within the cloud collide, snow is formed. However, snow will only fall from the cloud if the temperature of the air between the bottom of the cloud and the ground is below 40 degrees Fahrenheit. A higher temperature will cause the snowflakes to melt as they fall through the air, turning them into rain or sleet. Similar to ice storms, the effects from a snowstorm can disturb a community for a prolonged period of time. Buildings and trees can collapse under the weight of heavy snow.
Heavy Rain	Heavy rain occurs when the precipitation rate is between 0.39 - 2.0 inches per hour.
High Winds	High 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. While Alaska does not experience hurricanes, it experiences hurricane-force winds. Various wind scales equate wind speed to expected damages. Two widely used wind scales are the Beaufort Scale of Wind Strength and the Saffir-Simpson Hurricane Wind Scale, further explained below in Table 10 and Table 11.

Table 10- Beaufort Scale of Wind Strength

Force	Wind Speed (mph)	Damages
0	0-1	Calm: smoke rises vertically.
1	1-3	Direction of wind shown by smoke drift, but not by wind vanes.
2	4-7	Wind felt on face; leaves rustle; ordinary vanes moved by wind.
3	8-12	Leaves and small twigs in constant motion; wind extends light flag.
4	13-18	Raises dust and loose paper; small branches are moved.
5	19-24	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6	25-31	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.

Severe Weather Event	Nature of the Event

7	32-38	Whole trees in motion; inconvenience felt when walking against the wind.
8	39-46	Breaks twigs off trees; generally impedes progress.
9	47-54	Chimneys blown down; slate & tiles torn from roofs.
10	55-63	Trees broken or uprooted.
11	64-75	Trees uprooted; cars overturned.
12	75+	Wide-spread devastation, buildings damaged or destroyed.

Table 11- Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds (mph)	Damages
1	74-95	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	111-129	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130-156	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	157+	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

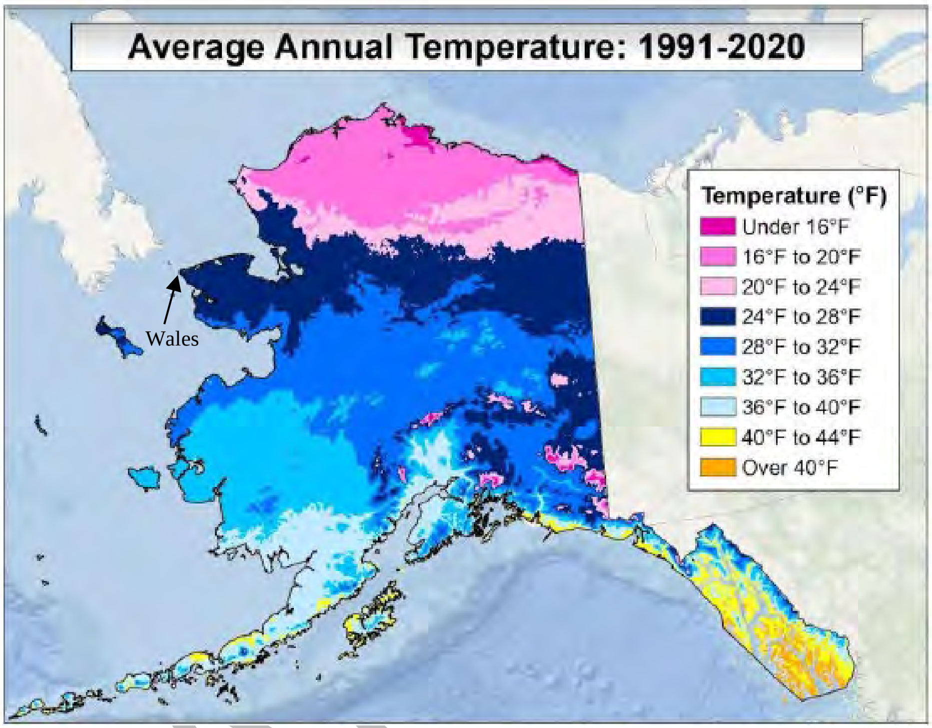
Severe Weather Event	Nature of the Event
Drought	A drought is a period of time when an area or region experiences below-normal precipitation. Droughts may range in severity but have many effects on the surrounding land and weather conditions. Droughts threaten people's livelihoods and can result in a water shortage, poor quality drinking water, poor air quality, loss or destruction of aquatic habitat, loss of vegetation or crops, and an increase in infectious diseases. Droughts are a slow-onset hazard and can last weeks, months, or even years. Because of the possible long duration of droughts, the impacts last for years and can ripple through a community over time. Drought conditions are classified in categories, which are described below:

Table 12- Classifications of Drought Conditions

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: • short-term dryness slowing planting, growth of crops or pastures Coming out of drought: • some lingering water deficits • pastures or crops not fully recovered
D1	Moderate Drought	• Some damage to crops, pastures • Streams, reservoirs, or wells low, some water shortages developing or imminent • Voluntary water-use restrictions requested
D2	Severe Drought	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3	Extreme Drought	• Major crop/pasture losses • Widespread water shortages or restrictions
D4	Exceptional Drought	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

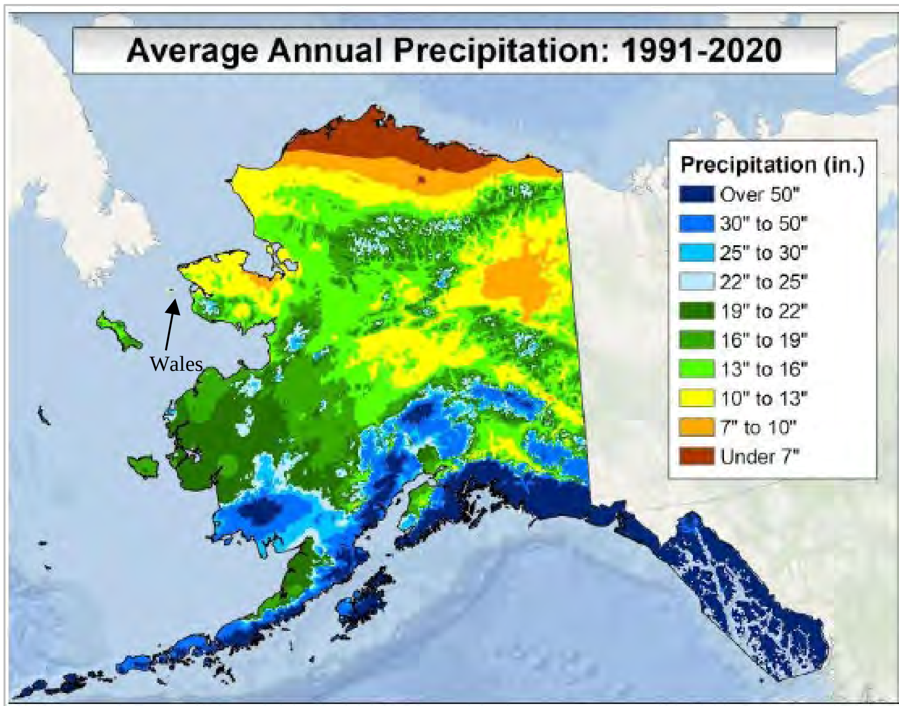
Source: U.S. Drought Monitor (USDM) 2024

Figure 14 shows Alaska's average annual temperature from 1991-2020 and Figure 15 shows Alaska's average annual precipitation from 1991-2020.



Source: NOAA NCEI Gridded Normals

Figure 14- Alaska Average Annual Temperature 1991-2020



Source: NOAA NCEI Gridded Normals

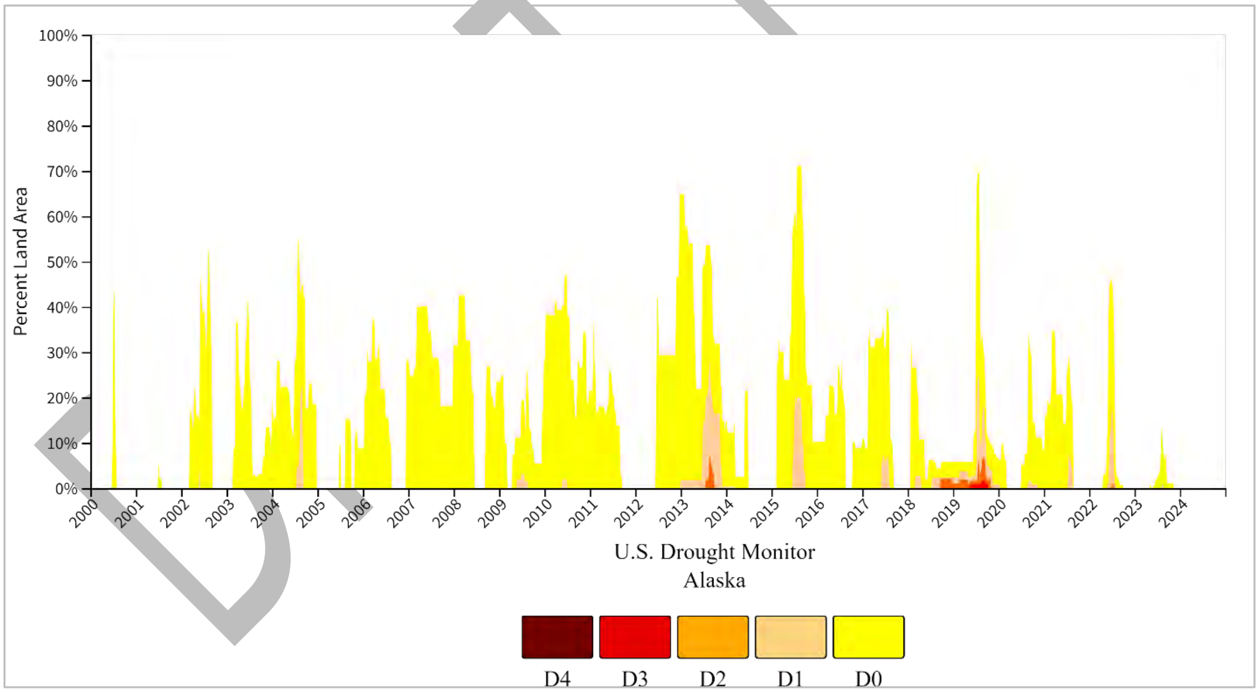
Figure 15- Alaska Average Annual Precipitation 1991-2020

3.3.2.2 History

The history of severe weather events documented in Wales are described below.

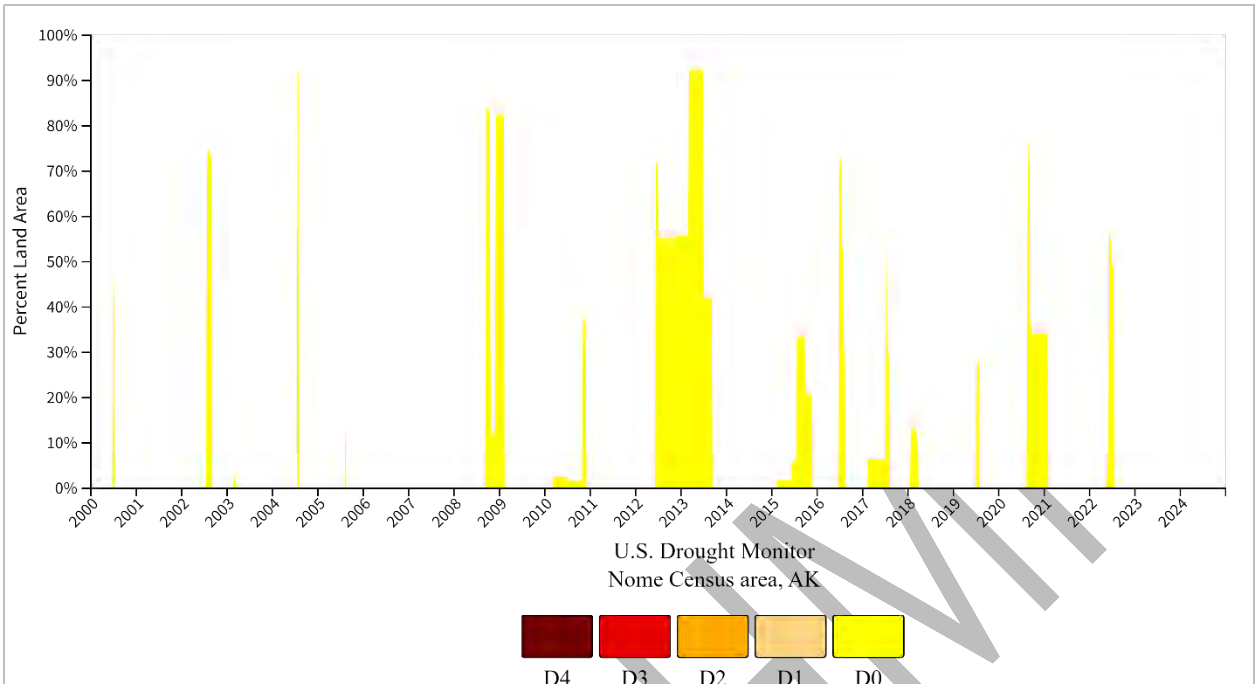
Severe Weather Event	History of the Event
Extreme Cold	Wind chills of -65ºF have been documented in Wales.
Freezing Rain and Ice Storms	Freezing rain and ice storms are not commonly reported in Wales, but they have historically occurred.
Heavy Snow	Wales averages 76 inches of snowfall per year. 10+ inches of snow have fallen with several hours in Wales.
Drifting Snow	Drifting snow has occurred in Wales during severe storm events with snowfall and accompanying high winds.
Blizzard	Blizzards are documented nearly annually in Wales.
Winter Storm	Numerous winter storms occur throughout Alaska every year. The most notable winter storms in Alaska's history are: • February 1966 in Fairbanks. Over 35 feet of snow. • March 2002 in Anchorage. Over 29 inches of snow with a rate of over 2 inches of snow per hour. • January 2012 in Valdez. Over 320 inches (27 feet) of snow in the span of a couple months. • January 2012 in Cordova. Over 18 feet of snow.

Severe Weather Event	History of the Event
	• December 2017 in Thompson Pass. Over 40 inches of snow in 12 hours. Winter storms, particularly blizzards, are common in Wales.
Heavy Rain	In Alaska, the year of 2022 was the 17th wettest year to date over the last 98 years, and specifically, July 2022 was the 6th wettest July over the past 98 years (USDM 2023). Wales averages 12 inches of rainfall per year. In Wales, winter precipitation is projected to increase by 53% by the end of the century (UAF/SNAP 2024a- Northern Climate Reports).
High Winds	The windiest places in Alaska are generally along the coastlines. Wind gusts of 75+ mph have been recorded in Wales. The Planning Team shared that they have experienced gusts of 100+ mph.
Drought	The U.S. Drought Monitor (USDM) started in 2000 and is a is an interactive tool/map that is updated each Thursday to show the location and intensity of drought conditions across the country. Since the creation of the USDM, the longest duration of drought conditions (D1–D4) recorded in Alaska lasted for 79 weeks. This drought began on July 17, 2018 and ended on January 14, 2020. This drought intensified to a D3 during the week of August 27, 2019 and affected 1.5% of Alaskan land (USDM 2023). Figure 16 shows the historical drought conditions for the State of Alaska (2000-January 2024) and Figure 17 shows historical drought conditions for the Nome Census Area (2000-January 2024).



Source: NIDIS 2024

Figure 16- Historical Drought Monitor Conditions for Alaska (2000-January 2024)



Source: NIDIS 2024

Figure 17- Historical Drought Monitor Conditions for Nome Census Area (2000-January 2024)

Table 13 lists Wales' historical severe storm events the National Weather Service (NWS) identified for their Weather Zone (Zone 213- St. Lawrence Island and Bering Strait) from January 1996 - November 2023. The NWS Storm Events Database has data dating back to January 1950 for many states, but it began collecting data for Alaska in January 1996. Additionally, any events resulting in a flood are addressed in the flood hazard section. See Table 16 for a list of these flooding events.

Table 13- Historical Severe Weather Events in Wales

Date	Event Type	Magnitude
01/27/1996	High Wind	A strong high over Alaska and several low-pressure centers moving north in the far western Bering Sea. Maximum sustained wind speeds were 44 kts at Cape Prince of Wales.
03/19/1996	High Wind	The combination between a deepening low-pressure center in the southwest Bering Sea and strong high pressure over eastern Alaska, and the low's weather front moving north over the Bering Sea produced strong winds intermittently. Cape Prince of Wales: SE 42g60 kts.
07/22/1996	High Wind	A slow-moving storm was just south of the Gulf of Anadyr and the associated weather front was moving north toward the Bering Strait. The combination created a strong southerly push of warm air, even though the weather front did not reach the Bering Strait until the next day, after it had greatly weakened. Cape Prince of Wales PMEL Platform reported winds south 36 to 40 kts sustained.
10/26/1996	High Wind	Cold air over Far East Russia met the remains of typhoon Carlo, deepening the storm as it moved north over the extreme western Bering Sea, then over Far East Russia to the Russian Arctic Coast. The warm front moved over the west coast of Alaska Sunday 27th, followed by a cold front Tuesday 29th. Maximum winds reported at Cape Prince of Wales: 39g58 kts.
11/13/1996	High Wind	The remains of super-typhoon Dale moved from the western Aleutians, north over Far East Russia, and continued northwest over the Russian Arctic. Central pressure of the storm remained between 940 and 950 mbs during this time, filling little, while 1040 mb High over eastern Alaska drifted into Canada at 1048 mbs. Peak winds speeds include Cape Prince of Wales: S 54g80 kts.

Date	Event Type	Magnitude
02/27/1997	High Wind	Strong High Pressure over Far East Russia and cold air moving south over the West Coast of Alaska produced strong winds at Tin City, possibly at Wales.
11/01/1997	High Wind	A series of storms moved from the southwest Bering Sea to the northeast Bering sea and southern Chukchi Sea. Resulting in high winds and possible blizzard conditions. Cape Prince Of Wales: 40 kts gusts 62 kts.
12/19/1998	High Wind	A storm south of the central Aleutian Islands moved north into the Bering Sea then northwest to far east Russia and weakened. On the 19th, the PMEL (Pacific Marine Environmental Laboratory) platform at Cape Prince of Wales on the Bering Strait Coast reported wind gusts to 60 mph.
01/14/2000	High Wind	A strong and complex frontal system over Russia Far East moved across the Bering Sea...Chukotsk Peninsula ...and into the Chukchi Sea on the 13th. On the morning of the 14th, a low-pressure center of 984 mb was located 480 miles northwest of Barrow with the cold front extending due south over the far western Brooks Range and central Seward Peninsula. Cape Prince of Wales PMEL platform gust 60 mph.
12/24/2004	Blizzard	With strong high pressure of 1049 mb covering the interior of Alaska, an occluded weather front moved north over the Bering Sea and Chukchi Sea on the night of the 24th through the 25th. At nearby Wales, a 29 YOM is presumed to have perished overnight on the 24th while he was returning to his home at the edge of the village. It is presumed he became disoriented, and ended up walking away from his home and village, to eventually die of hypothermia.
02/19/2008	Blizzard	Blizzard conditions likely occurred for a few hours overnight on the 19th, at Wales on the Bering Strait Coast, based on winds and visibility reported at the Tin City AWOS.
12/12/2008	High Wind	Ahead of a strong occluded front a period of very strong wind was observed at Wales along the Bering Strait coast. Sustained winds of 50 to 60 mph were observed with frequent gusts to 70 mph and a peak wind gust of 68 kts (78 mph).
12/14/2008	Blizzard	A low-pressure system over the western Bering Sea created blizzard conditions over the Bering Strait during the afternoon of the 14th. Blizzard conditions likely occurred at the village of Wales for 8 hours, as reported by the AWIS. Occasional wind gusts to near 52 kts (60 mph) were reported by the Wales AWIS during the afternoon.
12/17/2008	High Wind	A strong pressure gradient between a 1045 mb high in the Yukon and a 996 mb low in the Gulf of Anadyr produced a period of high winds along the Bering Strait Coast. The strongest winds were observed at Wales. A peak wind gust of 60 kts (69 mph) was observed at the Wales AWIS.
02/04/2009	Extreme Cold/Wind Chill	Temperatures of 20 to 35 below zero combined with a north to northeast wind of 25 to 40 mph to produce wind chills as low as 74 below zero along the Bering Strait coast during the 4th through the morning hours of the 5th. Here are the lowest wind chills that were observed: Wales AWIS: 65 below.
02/21/2009	High Wind Blizzard Blowing Snow	A 1047 mb high across northern Alaska on the morning of the 21st gradually shifted east into northern Canada by the morning of the 22nd. A 968 mb low tracked north along the Kamchatka Peninsula. A strong pressure gradient between the high and low produced a period of high wind and blizzard conditions along parts of the Bering Sea coast and Chukchi Sea coast. Along the Bering Strait Coast, the visibility was reduced to one quarter mile or less in snow and blowing snow at Wales from the afternoon hours of the 21st through the morning hours of the 22nd. In addition, the wind gusted as high as 65kt/75 mph at the Wales AWSS.
02/27/2009	Blizzard Drifting Snow	A 976 mb low near the northern Kamchatka Peninsula on the afternoon of the 26th tracked across the Chukotsk Peninsula during the afternoon of the 27th, and into the southern Chukchi Sea on the evening the 27th as a 983 mb low. The low then tracked northeast across the Arctic Ocean on the 28th. The storm brought blizzard conditions to much of the west coast as well as the arctic coasts of Alaska. On the Bering Strait coast, the wind gusted as high as 86 mph/75kt at the Wales AWSS with blizzard conditions in heavy snow and blowing and drifting snow.
03/08/2009	Blizzard	A 988 mb low south of the Aleutians at 3 pm on the 6th lifted north and deepened to 980 mb in the northern Bering Sea by 10 am on the 8th. A 1052 mb high across northern Alaska drifted slowly into western Canada during this time. The strong differences in pressure between the high and low produced strong winds and blizzard conditions along much of the west coast of Alaska. The blizzard conditions spread to the Bering Strait coast during the morning hours on the 8th, and continued into the afternoon. The following peak wind gusts were observed during this event: Wales AWSS: 63 mph/55kt.

Date	Event Type	Magnitude
03/29/2009	Blizzard	A 964 mb low in Bristol Bay at 4 am on the 29th lifted to the north and weakened to 977 mb across the Yukon Delta by the evening hours of the 30th. Ahead of the low, snow and blowing snow reduced the visibility to one quarter mile or less at Wales during the afternoon and evening hours of the 29th. A northeast wind of 35 to 45 mph was observed at the Wales AWSS with a peak wind gust of 48 mph/42kt.
05/16/2009	High Wind	A strong difference in pressure between a 993 mb low in the Northern Bering Sea, and a 1034 mb high in Northern Canada, produced a period of high winds on Saint Lawrence Island and along the Bering Strait Coast during the late evening hours on the 16th through the morning hours on the 17th. Here are the highest wind gusts that were observed: Wales (AWSS): 74 mph/64kt.
04/10/2010	Blizzard	A 956 mb low in the western Bering Sea at 1000AKST on the 9th tracked to the northeast and gradually weakened to 976 mb near the Gulf of Anadyr by 0400AKST on the morning of the 11th. A strong occluded front associated with the low produced blizzard conditions on Saint Lawrence Island and along parts of the west coast of Alaska. The blizzard conditions were observed at Wales from 1030AKST on the 10th, and likely continued into the late afternoon hours. After a peak wind gust of 60kt/69 mph was observed at the Wales AWSS, the power was lost.
12/18/2010	Blizzard High Wind	A frontal boundary associated with a 984 mb low near Wrangel Island produced heavy snowfall and blizzard conditions along portions of the west coast of Alaska on December 18-19, 2010. Peak wind gusts of 53 kt (61 mph) was observed at Both the Teller and Wales AWSS's during the late morning and early afternoon hours on the 18th. The high winds were accompanied by falling snow and the visibility was briefly reduced to one quarter mile in snow and blowing snow at Wales, but the blizzard conditions were short lived, and the visibility was one half mile or better during much of this event.
12/25/2010	Blizzard	A strong ridge of high pressure across eastern Russia combined with low pressure in the Gulf of Alaska to produce a strong pressure difference along the Chukchi Sea coast, the Bering Strait coast and on Saint Lawrence Island. The strong difference in pressure produced strong winds and created significant blowing and drifting snow and blizzard conditions. Blizzard conditions were observed at Wales along the Bering Strait Coast. At Wales, the blizzard conditions were observed from approximately 0300AKST on the 25th through 0400AKST on the 26th. The visibility was frequently reduced to one quarter mile or less in snow and blowing snow. A peak wind gust of 48 kt (55 mph) was observed at the Wales AWIS.
01/07/2011	Blizzard	A 978 mb low approximately 300 miles southwest of Saint Lawrence Island combined with a 1030 mb high across interior Alaska to produce blizzard conditions at Savoonga on Saint Lawrence. A brief period of blizzard conditions were also observed at Wales during the afternoon, but several observations were unavailable and it did not appear that the blizzard conditions lasted for 3 hours. There was, however, a peak wind gust of 53 kt (61 mph) at the Wales AWSS and several consecutive hours when the wind gusted to 52 kt (60 mph).
01/08/2011	High Wind	A second low quickly followed on the heels of the low that produced blizzard conditions on Saint Lawrence Island on the 7th and high winds at Wales. A 966 mb low near the southern Aleutians on the evening of the 7th moved rapidly north across the central Bering Sea on the 8th and produced another period of high winds at Wales. There was a peak wind gust of 60 kt (69 mph) at the Wales AWSS.
01/09/2011	High Wind	The area of low pressure that moved north across the central Bering Sea on the 8th continued to move north and across eastern Russia on the 9th. The strong pressure difference between the low and high pressure in the interior produced another period of high winds at Wales from approximately 1000AKST through 1530AKST on the 9th. A peak wind gust of 56 kt (64 mph) was observed at the Wales AWSS.
01/27/2011	Blizzard	A 960 mb low moving north crossed the Aleutians during the afternoon hours on the 27th and weakened to 974 mb 200 miles west of Saint Matthew Island by 3 pm AKST on the 28th. The low combined with a 1037 mb in Northwest Canada to produce strong winds on Saint Lawrence Island and along parts of the Bering Strait Coast. A peak wind gust of 46 kt (53 mph) was observed at the Wales AWSS.
02/14/2011	Blizzard High Wind	A 978 mb low along the coast of Kamchatka combined with a 1030 mb high across the southern interior of Alaska to produce snow and high winds on Saint Lawrence Island and along parts of the Bering Strait Coast. Blizzard conditions were observed at Gambell, Savoonga and Wales. The visibility was reduced to one quarter mile or less with white-out conditions at times. A second 998 mb low several hundred miles off the arctic coast combined with the high across the interior to produce blizzard conditions along parts of the arctic coast. The most severe blizzard conditions were observed at Barter Island along the eastern Beaufort Sea coast. Blizzard conditions were observed at Wales at times from 1908AKST on the 14th through 1851AKST on the 15th. The visibility was reduced to one quarter mile or less. There was a peak wind gust of 63kt (72 mph) at the Wales AWSS.
02/17/2011	Blizzard	A 970 mb low in the Gulf of Anadyr combined with a 1040 mb high in the Yukon to produce heavy snow and blizzard conditions along a portion of the west coast of Alaska.

Date	Event Type	Magnitude
		Along the Bering Strait Coast, blizzard conditions were observed at Wales at times during the last evening hours on the 16th into the early morning hours on the 17th. Although there was not a three consecutive hour stretch with the visibility below one quarter mile, there was a peak wind gust of 60 kt/69 mph at the Wales AWSS.
02/19/2011	Blizzard	A 966 mb low along the northern coast of Kamchatka at 0900AKST on the 19th moved into the Gulf of Anadyr as a 980 mb low at 0300AKST on the 20th. The low continued to gradually weaken to 988 mb in the southern Chukchi Sea by 1500AKST on the 20th. The low produced blizzard conditions along parts of the west coast of Alaska on the 19th into the 20th. Blizzard conditions were also observed at Wales from approximately 1800AKST on the 19th through 0400AKST on the 20th. There was a peak wind gust of 73 kt (84 mph) at the Wales AWSS.
02/22/2011	High Wind	A 968 mb low in the central Bering Sea at 2100AKST on the 23rd moved to the Gulf of Anadyr as a 976 mb low at 0900AKST on the 24th. The low tracked to the northeast as a 978 mb low in the southern Chukchi Sea at 2100AKST on the 24th. The low then tracked to the east and passed just south of Banks Island as a 980 mb low by 0900AKST on the 25th. The storm produced widespread blizzard conditions along the west coast as well as the arctic coast and heavy snowfall and high winds in parts of the interior. There were also areas of flooding and high water observed along parts of the west coast. Wales, which is located along the Bering Strait Coast had a wind gust to 53 kt (61 mph) during the early morning hours on the 24th, and Tin City had a wind gust to 52 kt (60 mph) during the morning hours on the 24th. Temperatures were a little above freezing at the time, which limited the amount of blowing snow and blizzard conditions, if they occurred were only very short in duration.
04/07/2011	Blizzard	A north Pacific low rapidly deepened south of the Aleutians during the evening of the 5th and was a 940 mb low as it passed over the Bering Sea buoy 46035 (350 miles north of Adak) around 1900AKST on the 6th. The low then weakened to 954 mb 150 miles west of Nunivak Island by 1500 AKST on the 7th, and to 981 mb along the Kuskokwim Delta at 1500AKST on the 8th. The low produced strong winds and heavy snowfall along much of the west coast. At Wales, blizzard conditions were observed from 2346AKST on the 6th until 0858AKST on the 7th. There was a peak wind gust of 43 kt/49 mph at the Wales AWSS.
10/12/2011	High Wind	A low-pressure center of 978 mb moved along the western Bering Sea on the 12th reaching the Bering strait on the morning of the 13th and weakening to 989 mb. The storm produced strong south to southeast winds on the 12th. Wind gusts reached up to 60 mph (52 knots) at the Wales AWSS.
11/08/2011	Blizzard	A 960 mb low over the southern Aleutians at 0300AKST on the 8th intensified to 945 mb near the Gulf of Anadyr by 2100AKST on the 8th. The low crossed the Chukotsk Peninsula as a 956 mb low at 0900AKST on the 9th, and moved into the southern Chukchi Sea as a 958 mb low by 2100AKST on the 9th. The low then tracked to the northwest and weakened to 975 mb about 150 miles north of Wrangel Island by 1500AKST on the 10th. The storm was one of the strongest storms to impact the west coast of Alaska since November 1974. At Wales, blizzard conditions were observed much of the time from 1450AKST through 1806AKST on the 8th. There was a peak wind gust to 77 kt (89 mph) at the Wales AWSS during the early morning hours on the 9th. There was some minor wind damage to buildings in the village.
12/03/2011	Blizzard	A 960 mb low approximately 200 miles west of Nunivak Island at 1500AKST on the 3rd moved north to Saint Lawrence Island by 0300AKST on the 4th as a 968 mb low. The low drifted slowly north to the Bering Strait as a 970 mb low by 1500AKST on the 4th. The low then weakened to 997 mb near Barrow by 0900AKST on the 5th and dissipated as a new 968 mb low developed bear Banks Island by 1500AKST on the 5th. The low produced heavy snow and blizzard conditions along much of the west coast and Arctic coast. At Wales, there was a brief period of blizzard conditions during the early afternoon hours on the 3rd, but the visibility only briefly dropped to one quarter of a mile.
02/01/2012	Extreme Cold/ Wind Chill	A cold air mass across northern Alaska combined with a strong pressure difference between a 950 mb low in the northern Gulf of Alaska and a ridge of high pressure across eastern Russia to produce strong wind and low wind chills along parts of the west coast of Alaska. A period of blizzard conditions were observed at Point Hope along the Chukchi Sea Coast. Temperatures of 29 to 33 below zero combined with a north wind of 15 to 25 mph to produce wind chills as low as 66 below zero at Wales. The wind chills were 60 below or lower from approximately 2100AKST on the 2nd through 1700AKST on the 3rd.
02/08/2012	Blizzard	There was a short period of blizzard conditions at Gambell and Wales during the afternoon hours on the 8th. The strong wind that produced the blizzard conditions was caused by a strong pressure difference between a 965 mb low south of the Alaska Peninsula and a 1025 mb high across eastern Russia. At Wales, the public reported that blizzard conditions were occurring at Wales during the early afternoon. The blizzard conditions likely occurred at times from approximately 1300AKST through 1600AKST.

Date	Event Type	Magnitude
02/25/2012	Extreme Cold/ Wind Chill	A 986 mb low in the southeast Bering Sea combined with a 1045 mb high in eastern Russia to produce snow and strong wind on Saint Lawrence Island and through the Bering Strait. Both Wales and Teller did have wind chills as low as 60 below.
08/23/2012	High Wind	A strong occluded front associated with a 976 mb low in the Gulf of Anadyr approached the Bering Strait coast late on the evening of the 23rd into the early morning of the 24th. There was a peak wind gust to 62 kt/71 mph at the Wales AWOS during the early morning hours of the 24th. The wind gusted over 60 mph at times from 2250AKST on the 23rd through 0116AKST on the 24th.
12/21/2012	High Wind	Strong southeast winds occurred over Saint Lawrence Island and the Bering Strait Coast during the early morning of the 21st as a weather front associated with a low over Far East Russia moved east across the Bering Sea. High Winds were reported at Wales, where the AWSS reported wind gusts as high as 63 kts (74 mph).
12/29/2012	Blizzard	A storm moving from the western Gulf of Alaska to Bristol Bay while high pressure remained stationary over Russia caused increased winds and blizzard conditions over far western Alaska at the end of December. Blizzard and near-blizzard conditions occurred at times during two days at Wales.
10/21/2012	High Wind	A strong 979 mb low over the Kamchatka Peninsula at 1000AKST coupled with strong high pressure over the interior of Alaska produced strong southerly winds over the west coast of Alaska during the day on the 21st. Zone 213- There was a peak wind gust to 56 kt (64 mph) at the Wales AWSS around midday on the 21st.
01/09/2013	Blizzard	A strong 980 mb low in the southern Bering Sea brought blizzard conditions to Wales on the 9th, as indicated by the AWOS.
01/11/2013	Blizzard	A 984 mb low moved north over the eastern Bering Sea on the 11th and gradually weakened by early on the 12th north of the Bering Strait. This system brought blizzard conditions to Wales. The Wales AWOS reported a peak gust to 45 kts (52 mph) during the event.
02/04/2013	Blizzard	Strong high pressure over Russia and low pressure in the Gulf of Alaska produced blizzard conditions on Saint Lawrence Island and the Bering Strait from 1456AKST on the 4th through 1850AKST on the 5th. Blizzard conditions were also observed at Wales on the afternoon of the 5th. The visibility was reduced to one quarter mile or less. There was a peak wind gust of 39kt (45 mph) at the Wales AWOS.
02/10/2013	Blizzard	Strong high pressure over Russia and low pressure over the Seward Peninsula produced blizzard conditions along the Bering Strait during the evening hours of the 10th|through the early morning hours of the 11th. The visibility was frequently reduced to one quarter mile or less. Blizzard conditions were also observed at Wales. The visibility was reduced to one quarter mile or less. There was a peak wind gust of 43kt (50 mph) at the Wales AWOS.
03/04/2013	High Wind	Strong winds developed along the west coast of Alaska between a 1045 high over the Arctic and 977 mb low pressure in the Gulf of Alaska. A gust of 58 kt (67 mph) was recorded at the Wales AWOS during the morning of the 5th.
03/05/2013	Blizzard	A 977 mb low moved north over the Bering Sea on the 5th of March and gradually weakened by early on the 6th north of the Bering Strait. This system brought blizzard conditions to Wales. The Wales AWOS reported a peak gust to 54 kts (63 mph) during the event.
11/06/2013	High Wind	A large and persistent area of high pressure which developed over the North Pacific forced the jet stream northward, which directed a series of very strong low-pressure systems into the Bering Sea from the 6th through the 14th of November. This weather pattern transported moisture and energy from the subtropics to the Bering Sea, which strengthened several storms. The AWOS at Wales reported a peak gust of 55 kt (63 mph) during the early afternoon on the 7th.
11/11/2013	Ice Storm High Wind	A complex low-pressure center of 993 mb over Kamchatka on the morning of the 12th moved to the southeast Beaufort Sea near Barter Island on the morning of the 14th deepening to 979 mb. This storm brought a variety of hazardous weather to northern Alaska: another surge of sea water across Norton Sound, rising 4 to 8 feet to prolong the inundation which had occurred just a few days earlier though the peak surge did occur during the falling tide so the overall rise in sea level was not as high as the previous event. A strong warm front with this system spread precipitation across the west coast and interior starting out as freezing rain, then rain, though remaining as snow near the Brooks Range. An estimated 0.20 inches of rain was reported at Wales along with high winds of 56 kt (64 mph) reported at the Wales AWOS. This event resulted in over $2M in damages in the region.
01/16/2014	Blizzard	A strong 952 mb low entered the eastern Bering Sea during the morning hours of the 17th. The associated occluded front pushed north during the day. A strong pressure gradient along with snow and strong winds produced blizzard conditions at a variety of locations along the West Coast of Alaska on January 17th.

Date	Event Type	Magnitude
		Wales likely experienced blizzard conditions on the 17th. The AWOS at Wales stopped reporting visibility after a few hours during what was likely the worst conditions.
02/15/2014	Blizzard	A strong 1043 mb high pressure centered over the Arctic coupled with a low-pressure center in the central Bering Sea produced strong winds and blowing snow and local blizzard conditions for several locations over western Alaska during the 16th and 17th. Blizzard conditions were observed at Wales. The visibility was reduced to one quarter mile or less in blowing snow. There was a peak wind gust of 46 kt (53 mph) at the Wales AWOS.
02/23/2014	Blizzard	A weather front moving north over the Bering Sea brough strong winds and blizzard conditions to Wales during the afternoon and early evening of the 23rd, as the AWOS frequently reported a visibility of around one-quarter mile in snow and blowing snow. Winds gusted to 53 kt (61 mph) just before the onset of blizzard conditions.
04/30/2014	High Wind	A strong warm front moved north over the Bering Sea early on the 30th, bringing high winds to Saint Lawrence Island and the Bering Strait Coast. The Wales AWOS reported gusts as high as 52 kt (60 mph).
10/26/2014	High Wind	A weather front moving north over the west coast of Alaska produced strong winds over the Bering Strait Coast and Saint Lawrence Island, as well as heavy snow over a portion of the Lower Kobuk Valley. High winds reported at Wales. The Wales AWOS: highest gust 56 kt (64 mph).
12/26/2014	High Wind	A tight pressure gradient developed between a strong 968 mb low pressure center in the far western Bering Sea and a 1045 mb high pressure center over the eastern Arctic slope on the 27th and 28th of December 2014. Wales AWOS highest reported gust was 70 mph (61 kt).
02/25/2015	Blizzard	A series of low-pressure systems developed in the western Bering Sea on the 25th of February. These lows produced strong south winds with snow and blowing snow and local blizzard conditions for the Bering Strait and along the coast of northwest Alaska during most of the day on the 25th. Blizzard conditions were observed at the Wales AWOS. The visibility was reduced to one quarter mile or less in snow and blowing snow. There was a peak wind gust of 51 kt (59 mph) at the Wales AWOS.
10/01/2015	High Wind	A tight pressure gradient developed between a strong 980 mb low pressure center in the far western Bering Sea and a 1040 mb high pressure center over the Canadian Yukon on the evening of the 1st and into the early morning hours of October 2nd 2015. High winds were reported at Wales. Wales AWOS highest reported gust was 71 mph (62 kt).
03/04/2016	Blizzard	A strong pressure gradient developed along the Bering Strait between 1031 mb high pressure over the arctic and a 968 low pressure system in the Gulf of Alaska. Blizzard conditions and strong winds developed on the west coast of the Seward Peninsula from the afternoon of the 4th of March into the morning hours of the 5th. Blizzard conditions were observed at Wales. Additionally, the wind gusted to 45 mph (39 kt) at the Wales AWOS.
10/24/2016	High Wind	A 950 mb low in the western Bering along with its associated occluded front produced strong winds along the Bering strait on the 25th of October. A peak wind gust of 84 mph (73 kt) was reported at the Wales AWOS.
01/30/2017	Blizzard	Low pressure system brought strong southerly winds and snow creating blizzard conditions for the upslope areas of Kobuk and Noatak valleys and the Bering Strait. Blizzard conditions at Wales. Gust of 62 kt (71 mph) reported at the Wales AWOS.
02/14/2017	Blizzard	A strong pressure gradient developed along the Bering strait between a 1034 mb high pressure center over Russia and a 965 mb low in Bristol Bay. Blizzard conditions developed along the Bering strait coast on February 14th. Blizzard conditions and one quarter mile visibility was reported on the Wales AWOS. A peak wind of 53 kt (61 mph) was reported.
10/11/2017	High Wind	Strong winds developed out ahead of an approaching 958 mb low pressure center along the west coast of Alaska on October 11. The strong winds continued into the 13th. Minor beach erosion also occurred along the coast. Low level areas of Wales saw elevated seas of 3 to 5 feet above normal tides. Wales AWOS reported 60 mph (52 kt).
11/06/2017	High Wind	A strong pressure gradient set up along the west coast on November 6th. Strong winds continued into the 7th. A peak wind of 70 mph (61 kt) was reported at the Wales AWOS.
11/14/2017	Blizzard	A weather front produced strong winds and low visibility to parts of the west coast and northwest Alaska on the 14th of November. Blizzard conditions reported at the Wales AWOS. A peak wind of 52 kt (60 mph) also reported.

Date	Event Type	Magnitude
11/19/2017	Blizzard	Strong winds developed out ahead of an approaching frontal boundary along the west coast of Alaska on November 19th. The strong winds continued into the 23rd. Blizzard conditions and high winds along the Bering Strait and along the west coast and north slope were observed. Wales AWOS reported one quarter mile or less at times with a peak wind gust of 60 mph (52 kt).
11/25/2017	High Wind	Strong winds developed out ahead of an approaching low pressure system along the west coast of Alaska on November 25th. High winds and high surf along the Bering Strait were observed. Water levels rose 2 to 3 feet above normal tides and waves of 12 to 14 feet offshore. Minor beach erosion reported. Wales AWOS reported a peak wind gust of 67 mph (59 kt).
12/17/2017	Blizzard	Low pressure brought snow and blowing snow and strong winds to the west coast on December 17th 2017. Heavy snow fell in the mountains of the Seward Peninsula and the Nulato Hills. Blizzard conditions were observed at the Wales AWOS. The visibility was reduced to one quarter mile or less in snow and blowing snow. There was a peak wind gust of 65 kt (75 mph) at the Wales AWOS.
11/04/2020	Blizzard	A strong low-pressure system produced strong winds and blizzard conditions to much of the west coast from November 4th into the 5th. Blizzard conditions were reported at the Wales AWOS. A peak wind of 80 mph (70 kt) was reported.
01/29/2021	Blizzard	A strong low-pressure system entered the Bering Strait on the 29th of January. Blizzard conditions were reported along the Bering strait on January 29th. Blizzard conditions reported at the Wales AWOS with a peak gust of 33 kt (38 mph).
05/13/2023	High Wind	On May 13, 2023, front associated with a 988 mb low in the Bering Sea brought high winds to the Bering Strait Coast, St. Lawrence Island, as well as the Yukon Delta. High winds developed along the Bering Strait Coast as well as St. Lawrence Island on the evening of May 13th and continued into the early morning hours of May 14th. Wales reported gusts as high as 62 mph before the wind sensor failed during the middle of the event.
05/16/2023	Blizzard	On May 16, 2023, a 1002 mb low moving through the Bering Sea brought blizzard conditions to the Bering Strait. Blizzard conditions developed on the Bering Strait coast early in the morning, of the 16th and continued into the early evening. Blizzard conditions were reported at both Brevig Mission and Wales. Wales reported blizzard conditions for much of the morning of the 16th. The peak wind gust at Wales was 41 mph.
10/23/2023	High Wind	High winds developed over the Bering Strait Coast as a front moved to the north over the area. Wales reported a gust to 63 mph, while Tin City reported a gust to 59 mph and Teller reported a gust to 54 mph.
11/12/2023	Blizzard	Blizzard conditions were observed at the Wales (PAIW) AWOS. Wind gusts of 60 mph began at 06:13 and continued through 12:52, with a peak wind gusts of 73 mph. These winds were accompanied by visibility of 1/4 mile or less in blowing snow.

Source: NWS 2024- Storm Events Database and Storm Prediction Center Product

Additionally, the DHS&EM October 2022 DCI lists the following severe weather disaster events which may have affected the area:

83. Omega Block Disaster, January 28, 1989 & FEMA declared (DR-00826) on May 10, 1989. The Governor declared a statewide disaster to provide emergency relief to communities suffering adverse effects of a record-breaking cold spell, with temperatures as low as -85°F. The State conducted a wide variety of emergency actions, which included: emergency repairs to maintain & prevent damage to water, sewer & electrical systems, emergency resupply of essential fuels & food, and DOT/PF support in maintaining access to isolated communities.

3.3.2.3 Location

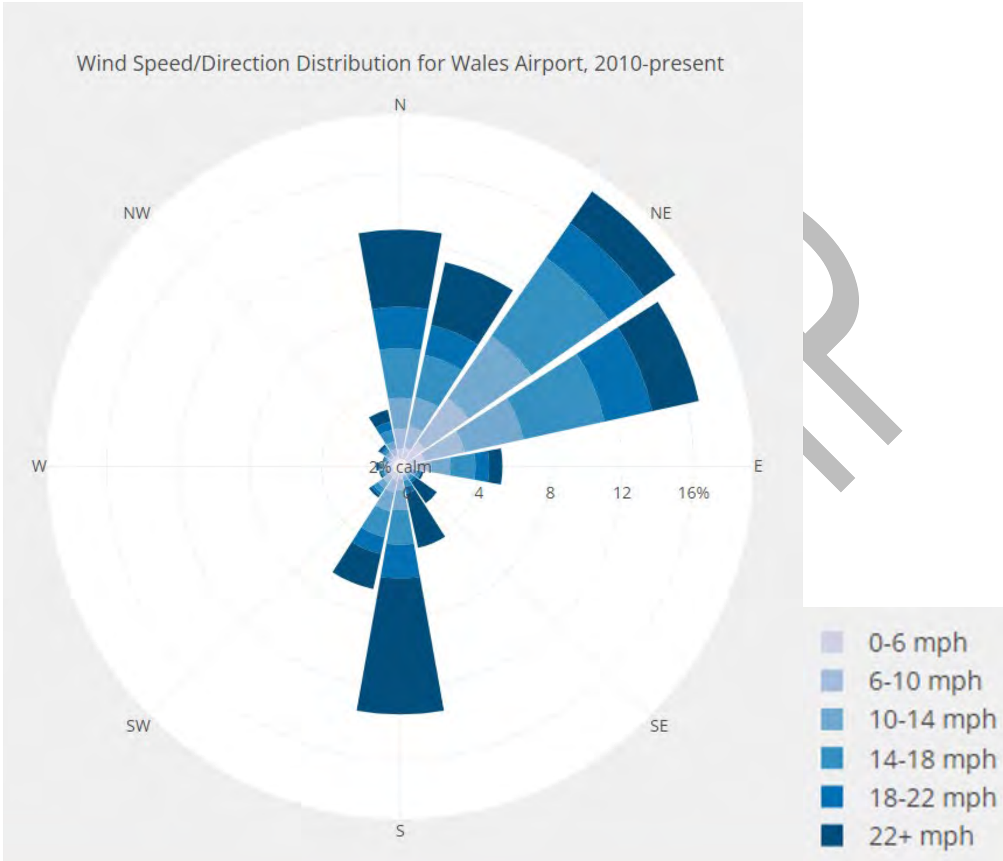
The entire community of Wales experiences periodic severe weather impacts.

3.3.2.4 Extent (Magnitude and Severity)

Wales is vulnerable to the impacts from severe weather. The extent (magnitude and severity) of each severe weather event is listed below.

Severe Weather Event	Extent (Magnitude and Severity) of the Event
Extreme Cold	Wind chills of -65ºF have been recorded in Wales. The Planning Team shared that in 1999, the wind chill reached -94ºF.
Freezing Rain and Ice Storms	Wales experiences periodic freezing rain and ice storms that have damaged utility lines and cause dangerous road conditions.
Heavy Snow	Wales experiences severe storm conditions accumulating over 10-20 inches of snowfall within several hours.  Source: USA Today 2016 **Figure 18- Deep Snow Buries Boat in Wales**
Drifting Snow	Wales experiences periodic drifting snow events that have caused blockages on roads and snow buildup on the sides of buildings.  Source: Wales LEDP 2011-2016 **Figure 19- Snow Drift at the Native Store**

Severe Weather Event	Extent (Magnitude and Severity) of the Event
	 Source: USA Today 2016 **Figure 20- Snow Drift in Wales**
Blizzard	Blizzards reduce visibility and can lead to disorientation and eventual hypothermia. There has been one fatality in Wales due to a blizzard.
Winter Storm	Wales experiences periodic winter storms that have caused blizzard conditions, heavy snowfall, high winds, and deaths due to hypothermia.
Heavy Rain	Heavy rain in Wales leads to runoff and causes local creeks to overtop and threaten facilities.
High Winds	Wales experiences severe storm conditions with wind speeds and gusts exceeding 75 mph. Figure 21 shows annual wind speed and direction distribution for Wales from 2010-present. • Spokes in the rose point in the compass direction from which the wind was blowing (i.e., a spoke pointing to the right denotes a wind from the east). • Colors within each spoke denote frequencies of wind speed occurrence. • Size of the center hole indicates the % of calm winds. The accompanying legend is below.

Severe Weather Event	Extent (Magnitude and Severity) of the Event
	 Source: UAF/SNAP 2024b- Community Wind **Figure 21- Annual Wind Speed/Direction Distribution in Wales, 2010-Present**
Drought	Wales has not been too severely impacted by historical droughts in the area.

Based on past severe weather events and the criteria identified in Table 6, the extent of overall severe weather in Wales is considered Limited to Critical, 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 10-25% of property would be severely damaged.

3.3.2.5 Impact

The location, land topography, and intensity influence the severity of a severe weather event impact within a community. Below are the impacts of various historical severe weather events in Wales.

Severe Weather Event	Impact of the Event
Extreme Cold	Extreme cold may also impact a community by disrupting the flow of transportation within the community. With extreme cold temperatures, comes ice fog, which may ground an aircraft carrying supplies until conditions improve. Prolonged periods of cold can cause large bodies of water to freeze, disrupting shipping and increasing the likelihood of ice jams and associated flooding.

Severe Weather Event	Impact of the Event
	While Alaskans have engineered ways to stay warm during extreme cold, infrastructure can only withstand and function within a certain temperature range. Extreme cold can cause electric generation to malfunction or cause fuel to congeal in supply lines and storage tanks. Without electricity, heaters and furnaces do not work, and water/sewage pipes can freeze or rupture. A combination of extreme cold and little to no snow cover, increases the ground's frost depth, which can disturb pipes beneath the ground. Extreme cold can impact a community's infrastructure, the greatest danger from extreme cold is its impact on humans. Prolonged exposure to extreme cold can cause frostbite or hypothermia and become life-threatening very quickly. Infants and elderly people are most susceptible to these conditions. Carbon monoxide poisoning is another threat as people use supplemental heating devices without proper ventilation. Extreme cold accompanied by wind intensifies life-threatening exposure injuries such as hypothermia and frostbite. Impacts from extreme cold in Wales have included loss of utilities and school closures.
Freezing Rain and Ice Storms	Ice accumulations can damage trees, utility poles, and communication towers. Ice on communication towers can disrupt transportation, power, and communications within the community. Ice storms are often the cause of automobile accidents, power outages, and personal injury. Impacts from freezing rain and ice storms in Wales have included loss of utilities.
Heavy Snow	Heavy snow can impact a community by halting transportation in and out of a community. Until the snow can be removed, roadways and airports are impacted, even closed completely. With these services out of commission, supplies are not able to be brought into the community, and emergency and medical services are halted. Excess weight from accumulated snow on roofs, trees, and powerlines can cause them to collapse. Heavy snow can also damage light aircraft and cause small boats to sink. Once temperatures reach above freezing, the heavy snow will begin to thaw, and can cause substantial flooding. The cost of snow removal, repairing damages, and the loss of business can have severe economic impacts on the community. Heavy snow can lead to injury or death as a result of vehicle and or snow machine accidents. Other causalities can occur due to hypothermia caused by prolonged exposure to cold weather or overexertion while shoveling snow. Impacts from heavy snow in Wales have included structural damages to buildings and home. Heavy snow has buried homes in the community and residents have to dig through the snow to enter their homes. There are snow fences in Wales that help minimize the number of snowdrifts.
Drifting Snow	The most common hazard caused by blowing and drifting snow is quickly reduced visibility while driving. The combination of near-zero visibility and drifting snow can cause unexpected travel difficulties and accidents in remote areas during dangerously cold winter weather situations. Impacts from drifting snow in Wales have included loss of visibility and dangerous road conditions. There are snow fences near the airport and homes that help minimize the number of snowdrifts in the community.
Blizzard	Conditions during a blizzard can be extreme, resulting in severe impacts to community. During a blizzard, heavy or blowing snow can cause whiteout conditions, making travel difficult and unsafe. Roads can become partially or fully blocked by snowdrift. Cold temperatures associated with blizzards can last for days after the storm has ended, increasing the potential for hypothermia or frostbit. High winds during a blizzard may disrupt utilities, potentially leaving homes without heat and power until after the storm has ended and utilities are restored. Impacts from blizzards in Wales have included reduction or loss of visibility, loss of utilities, damage to buildings, and a fatality.

Severe Weather Event	Impact of the Event
Winter Storm	A winter storm can last a few hours or several days, cut off utilities, and put older adults, children, sick individuals, and pets are at greater risk. Winter storms create a higher risk of car accidents, hypothermia, frostbite, carbon monoxide poisoning, and heart attacks from overexertion. Winter storms can also cause property damage. Some impacts to homes and other infrastructure may include roof damage or collapse, water damage from frozen or busted pipes, cracks in caulking due to extreme cold, damage to building foundations. Winter storms and cold temperatures can also impact vehicles (cars, snowmachines) that the community relies upon for transportation. These impacts may include slowing the battery, hurting the cooling system, thickening fluids, damaging the engine, and increasing the potential for vehicular accidents. Impacts from winter storms in Wales have included loss of visibility, loss of utilities, snow load considerations, school closures, damage to critical facilities and infrastructure, and hindered snow removal efforts.
Heavy Rain	The potential impacts of heavy rain include crop damage, erosion, and an increased flood risk. Floods onset from heavy rain can result in road washouts, injuries/loss of life, or drowning. Impacts from heavy rain in Wales have included localized flooding of local creeks and streams. If a creek becomes blocked and overflows, the community will open the creek and allow it to flow into the ocean until the water level recedes.
High Winds	High winds can result in downed power lines, flying debris, building collapses, transportation disruptions, damage to buildings, damage to vehicles, and injury or death. High winds can cause power outages, resulting in lack of heating, running water, refrigeration loss, and damage to electronics and/or medical equipment. Impacts from high winds in Wales have included loss of utilities, blown in doors on homes, and damage to buildings and residences.
Drought	Droughts can severely impact a community by causing shortages in safe drinking water, reducing air quality by increasing the risk of wildfires and dust storms, increasing the potential of illness and disease, and increasing economic burdens. Droughts can also impact the environment by reducing soil quality for vegetation, reduction or degradation of fish and wildlife habitat, and lowering the water level of lakes, ponds, or reservoirs which can hinder salmon spawning abilities. For 64 weeks, starting on October 2, 2019, Alaskan salmon were unable to enter many streams due to low flow conditions and drought conditions throughout Alaska caused many pre-spawn mortality events of salmon. All species of salmon were affected by the drought conditions statewide, leading to widespread mortality (USDM 2023). On June 27, 2019, there was a statewide ban of purchasing fireworks due to the high to very high fire danger as a result of hot, dry weather. At the time, there were 130 active wildfires burning 273,521 acres across the state (USDM 2023). Wales has not been severely impacted by droughts.

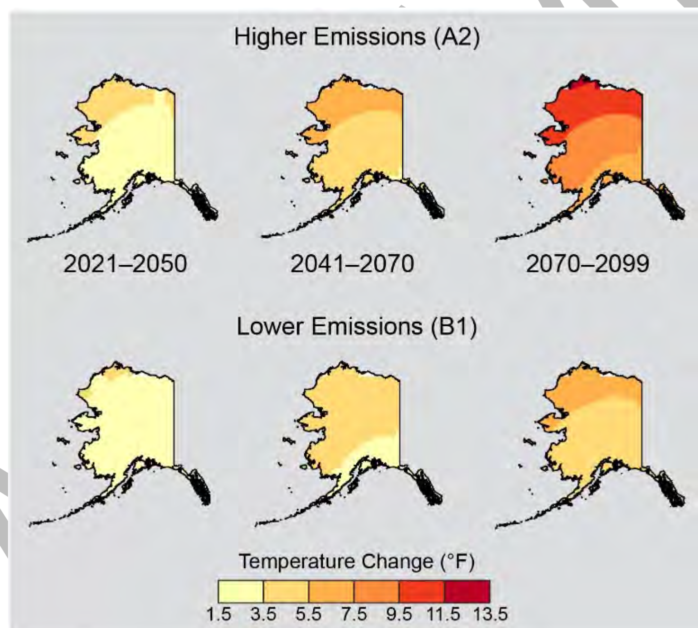
3.3.2.6 Probability of Future Events

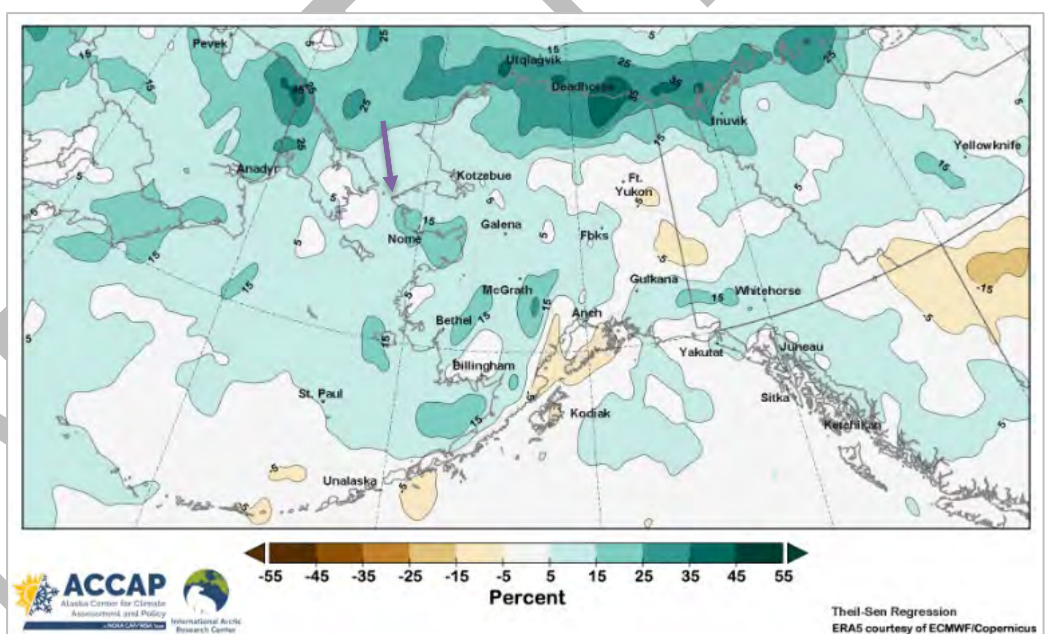
The probability of future events for each severe weather event is outlined below.

Severe Weather Event	Probability of the Event
Extreme Cold	Based on previous occurrences and the criteria identified in Table 7, it is Likely that Wales will experience an extreme cold 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.
Freezing Rain and Ice Storms	Based on previous occurrences and the criteria identified in Table 7, it is Possible that Wales will experience a freezing rain/ice storm 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.
Heavy Snow	Based on previous occurrences and the criteria identified in Table 7, it is Likely that Wales will experience a heavy snow 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.
Drifting Snow	Based on previous occurrences and the criteria identified in Table 7, it is Likely that Wales will experience a drifting snow 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.
Blizzard	Based on previous occurrences and the criteria identified in Table 7, it is Highly Likely that Wales will experience a blizzard 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.
Winter Storm	Based on previous occurrences and the criteria identified in Table 7, it is Highly Likely that Wales will experience a winter storm 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.
Heavy Rain	Based on previous occurrences and the criteria identified in Table 7, it is Highly Likely that Wales will experience a heavy rain 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.
High Winds	Based on previous occurrences and the criteria identified in Table 7, it is Highly Likely that Wales will experience a heavy wind 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.
Drought	Based on previous occurrences and the criteria identified in Table 7, it is Possible that Wales will experience drought conditions 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.

3.3.2.7 Future Conditions Including Climate Change

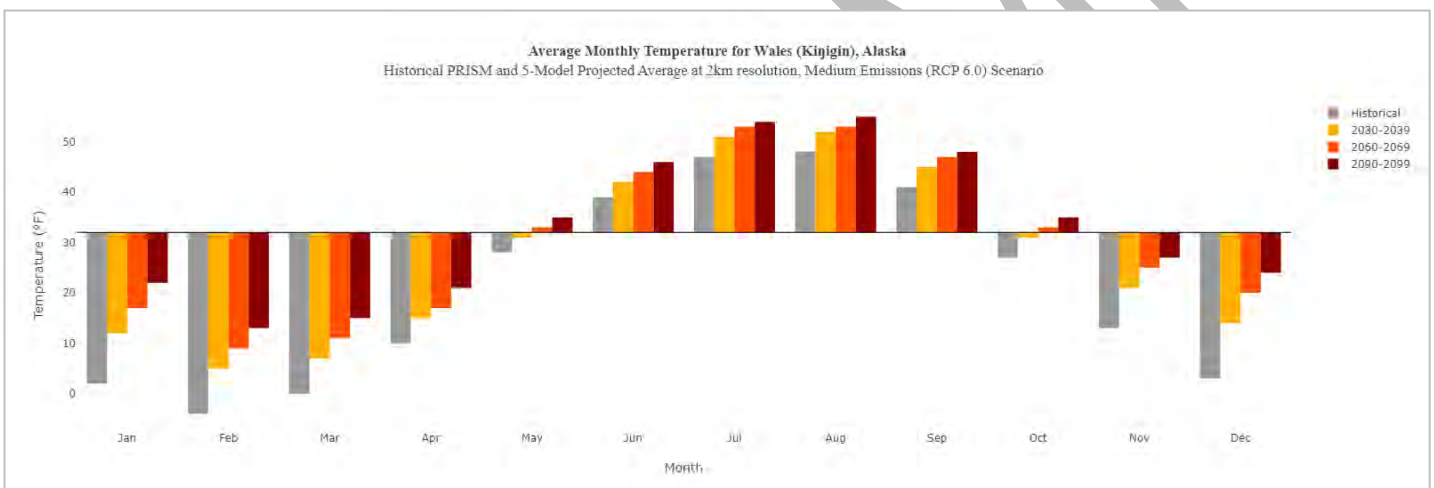
The nature or location of severe weather events in Wales are not anticipated to change due to climate change. However, the extent of severe weather events is expected to change due to climate change. The anticipated changes for each event are described below.

Severe Weather Event	Projected Changes in Extent (Magnitude and Severity) due to Climate Change
Extreme Cold	Average annual temperatures in Alaska are projected to rise by an additional 2°F to 4°F by 2050 (USGCRP 2018). If global emissions continue to increase during this century, temperatures can be expected to rise 10°F to 12°F in the north, 8°F to 10°F in the interior, and 6°F to 8°F in the rest of the state (USGCRP 2018). In Wales, average annual temperatures may increase by about 14°F by the end of the century (UAF/SNAP 2024a- Northern Climate Reports). Winter temperatures are increasing the most (+25°F) and fall may transition from below freezing to above freezing temperatures in the future (UAF/SNAP 2024a- Northern Climate Reports). Figure 22 shows Alaska's predicted temperature changes under a higher emissions scenario and a lower emissions scenario through 2099. See Figure 24 for historical and projected temperatures for Wales.  Source: USGCRP 2018 **Figure 22- Alaska's Predicted Temperature Changes Through 2099**
Freezing Rain and Ice Storms	Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (EPA 2016). As global temperatures continue to rise, freezing rain and ice storm events may be less severe as historical storms.
Heavy Snow	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). Wales experiences severe storm conditions accumulating over 10-20 inches of snowfall within several hours.
Drifting Snow	As wind speeds are projected to increase in the northern and western coastal regions of Alaska (Redilla et al. 2019), drifting snow events will increase as long as snow is present. However, 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).

Severe Weather Event	Projected Changes in Extent (Magnitude and Severity) due to Climate Change
	Wales experiences periodic drifting snow events that have caused snow buildup and blockages on roads. Blowing and drifting snow in Wales have caused school delays and closures.
Blizzard	There are many studies on the effect of climate change on the extent of blizzards in the contiguous United States, particularly the Northeast region of US. However, there is little published information on the effect of climate change and blizzards in Alaska. Studies show that climate change could exacerbate the severity of blizzards (Dixon et al. 2018). A warmer atmosphere holds more moisture. This moisture eventually falls as precipitation—either as rain or snow, which results in more frequent and intense storms.
Winter Storm	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 (Dixon et al. 2018).
Heavy Rain	Alaska has experienced an 11% increase in the amount of precipitation falling in very heavy events from 1958 to 2012 (EPA 2016). Extreme precipitation events have occurred throughout Alaska with increasing frequency. In Wales, winter precipitation is estimated to increase by +53% by the end of the century (UAF/SNAP 2024a- Northern Climate Reports). Figure 23 shows the percent change in annual average precipitation from 1973–2022 in Alaska. Based off this figure, average precipitation in Wales has increased by 5-15%.  Source: USDA 2024 **Figure 23- Percent Change in Annual Average Precipitation Statewide (1973-2022)** See Figure 25 for historical and projected precipitation amounts for Wales.
High Winds	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 (Redilla et al. 2019).
Drought	Climate change is increasing the intensity and length of severe weather events including droughts. Increased exposure to extremes will surpass the resilience of ecological and human systems.

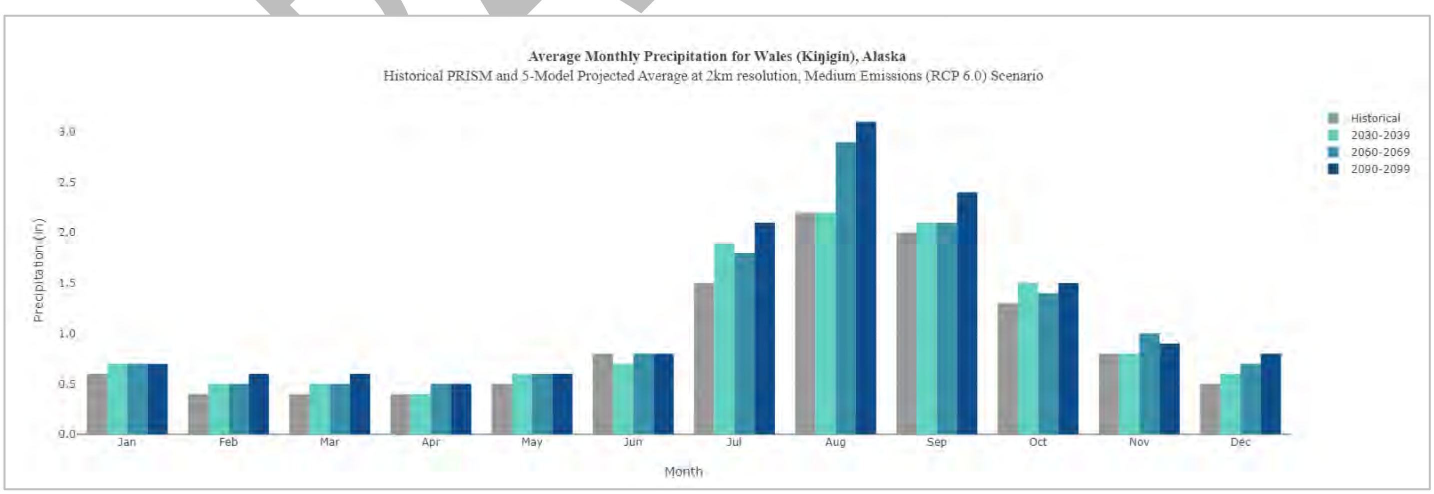
Severe Weather Event	Projected Changes in Extent (Magnitude and Severity) due to Climate Change
	Already vulnerable communities may be unable to adapt, laying bare systemic inequalities and requiring emergency assistance (IPCC 2019). The U.S. Drought Monitor started in 2000. Since 2000, the longest duration of drought (D1–D4) in Alaska lasted 79 weeks beginning on July 17, 2018 and ending on January 14, 2020. The most intense period of drought occurred the week of August 27, 2019, where D3 affected 1.5% of Alaska land (USDM 2023). Climate change has altered the natural pattern of droughts, making them more frequent, longer, and more severe (USGS 2024b).

The University of Alaska Fairbanks's (UAF) Scenarios Network for Alaska and Arctic Planning (SNAP) depict Wales' historical and future projected temperatures and precipitation amounts under a medium emissions scenario (Figure 24 and Figure 25).



Source: UAF/SNAP 2024c- Community Climate Charts

Figure 24- Historical and Projected Temperatures for Wales



Source: UAF/SNAP 2024c- Community Climate Charts

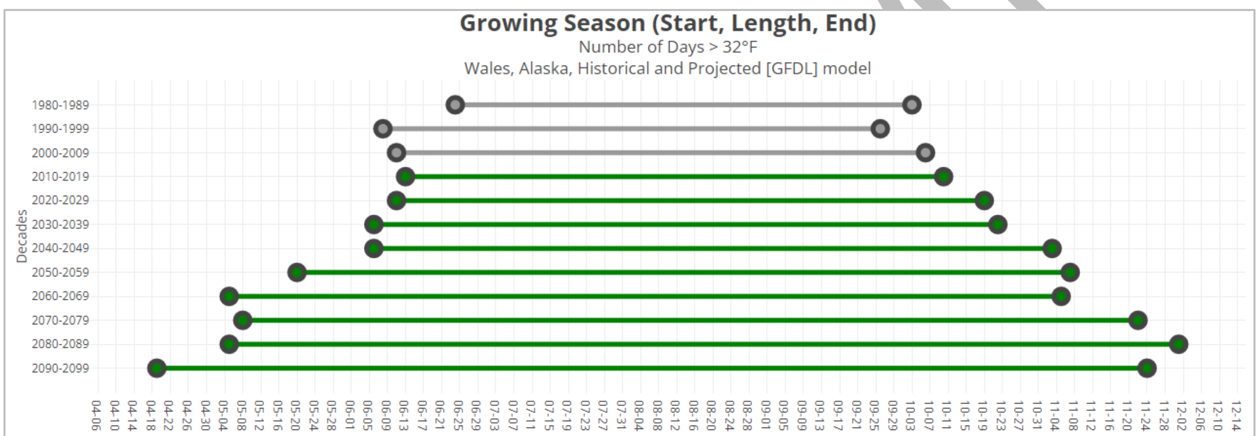
Figure 25- Historical and Projected Precipitation Amounts for Wales

Due to climate change, the impacts of severe weather events to the community of Wales are expected to change. Projected impacts of each event are outlined below.

Severe Weather Event	Projected Changes in Impact due to Climate Change
Extreme Cold	Due to climate change, average annual temperatures in Alaska are projected to rise by an additional 2°F to 4°F by 2050 (USGCRP 2018). In nearby Tin City, average annual temperatures may increase by about 14°F by the end of the century (UAF/SNAP 2024a- Northern Climate Reports). Winter temperatures are increasing the most (+25°F) and fall may transition from below freezing to above freezing temperatures in the future (UAF/SNAP 2024a- Northern Climate Reports). Extreme cold may also impact a community by disrupting the flow of transportation within the community. With extreme cold temperatures, comes ice fog, which may ground an aircraft carrying supplies until conditions improve. Prolonged periods of cold can cause large bodies of water to freeze, disrupting shipping and increasing the likelihood of ice jams and associated flooding. While Alaskans have engineered ways to stay warm during extreme cold, infrastructure can only withstand and function within a certain temperature range. Extreme cold can cause electric generation to malfunction or cause fuel to congeal in supply lines and storage tanks. Without electricity, heaters and furnaces do not work, and water/sewage pipes can freeze or rupture. A combination of extreme cold and little to no snow cover, increases the ground's frost depth, which can disturb pipes beneath the ground. While extreme cold can impact a community's infrastructure, the greatest danger from extreme cold is its impact on humans. Prolonged exposure to extreme cold can cause frostbite or hypothermia and become life-threatening very quickly. Infants and elderly people are most susceptible to these conditions. Carbon monoxide poisoning is another threat as people use supplemental heating devices without proper ventilation. Extreme cold accompanied by wind intensifies life-threatening exposure injuries such as hypothermia and frostbite. 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). Higher temperatures in spring and fall could also result in longer a growing season (UAF/SNAP 2024d- Alaska Garden Helper). See Figure 26 below for the historical and projected length of the growing season in Wales. Impacts from extreme cold in Wales have included loss of utilities.
Freezing Rain and Ice Storms	Due to climate change, average annual temperatures in Alaska are projected to rise by an additional 2°F to 4°F by 2050 (USGCRP 2018), while the intensity and frequency of winter storms and other storm events is projected to increase (Dixon et al. 2018). How these factors will affect the impact of freezing rain and ice storm events in Wales is unknown. Impacts from freezing rain and ice storms in Wales have included loss of utilities.
Heavy Snow	Within the next century, climatically-driven changes in snow characteristics (decreasing snowfall, snowpack, and snowmelt) will affect hydrologic and ecological systems in Alaska (Littell et al. 2018). Impacts from reduced snowpack and less frequent snowfall will directly affect the spawning habitats for salmon. 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,

Severe Weather Event	Projected Changes in Impact due to Climate Change
	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). A shift from snow to rain impacts water storage capacity and surface water availability (UAF/SNAP). Impacts from heavy snow in Wales have included structural damages to buildings.
Drifting Snow	Projected climate change impacts are expected to reduce snowpack (NPS 2020), while high-wind events are projected to become more frequent, with the highest increases in the northern and western Alaska coastal regions (Redilla et al. 2019). How these competing factors will affect the impact of drifting snow events in Wales is unknown. Impacts from drifting snow in Wales have included loss of visibility, dangerous road conditions, and buried homes.
Blizzard	Studies show that climate change could exacerbate the severity of blizzards (Dixon et al. 2018), potentially resulting in worsening impacts to the community. Conditions during a blizzard can be extreme, resulting in severe impacts to community. During a blizzard, heavy or blowing snow can cause whiteout conditions, making travel difficult and unsafe. Roads can become partially or fully blocked by snowdrift. Cold temperatures associated with blizzards can last for days after the storm has ended, increasing the potential for hypothermia or frostbite. High winds during a blizzard may disrupt utilities, potentially leaving homes without heat and power until after the storm has ended and utilities are restored. Impacts from blizzards in Wales have included reduction or loss of visibility, loss of utilities, damage to homes, and a fatality.
Winter Storm	Climate scientists have suggested that warming global temperatures may be enabling longer and more intense cycles of winter storms (Dixon et al. 2018) resulting in worsening impacts to the community. A winter storm can last a few hours or several days, cut off utilities, and put older adults, children, sick individuals, and pets are at greater risk. Winter storms create a higher risk of ATV/snowmobile accidents, hypothermia, frostbite, carbon monoxide poisoning, and heart attacks from overexertion. Winter storms can also cause property damage. Some impacts to homes and other infrastructure may include roof damage or collapse, water damage from frozen or broken pipes, cracks in caulking due to extreme cold, damage to building foundations. Winter storms and cold temperatures can also impact vehicles by draining the battery, damaging the cooling system, thickening fluids, damaging the engine, and increasing the potential for vehicular accidents. Impacts from winter storms in Wales have included loss of visibility, loss of utilities, snow load considerations, school closures, and damage to critical facilities and infrastructure.
Heavy Rain	In Wales, winter precipitation is projected to increase by 53% by the end of the century (UAF/SNAP 2024a- Northern Climate Reports). With increased precipitation, the impact of heavy rain in Wales may increase. These impacts may include increased flooding and road washouts throughout the community. Impacts from heavy rain in Wales have included localized flooding of creeks.
High Winds	As high wind events are projected to increase (Redilla et al. 2019), impacts from high wind events may also increase.

Severe Weather Event	Projected Changes in Impact due to Climate Change
	Impacts from high winds in Wales have included loss of utilities, and damage to buildings and residences.
Drought	Climate change-driven effects upon hydrology, seasonal snowpack, and days above freezing temperatures will alter the water supply in snowmelt/glacier runoff fed streams and rivers in turn affecting the water supply for Alaskan communities, wildlife, and landscapes. In conjunction with lower ground-water levels, droughts can drive salinization in soil, estuaries, and wetlands along coastlines as sea-water fills voids formerly occupied by fresh water. Indirect effects of climate change-induced droughts include threats to the tourism industry, food insecurity, and threats to the Alaskan subsistence lifestyle (IPCC 2019). Wales has not been severely impacted by droughts.



Source: UAF/SNAP 2024d- Alaska Garden Helper

Figure 26- Historical and Projected Length of Growing Season in Wales

The frequency of severe weather events is dependent on the event and climate change will impact each differently. The projected changes in event frequency are outlined below.

Severe Weather Event	Projected Changes in Probability of Future Events due to Climate Change
Extreme Cold	Due to climate change, average annual temperatures in Alaska are projected to rise by an additional 2°F to 4°F by 2050 (USGCRP 2018; UAF/SNAP). In nearby Tin City, average annual temperatures may increase by about 14°F by the end of the century (UAF/SNAP 2024a- Northern Climate Reports). Winter temperatures are increasing the most (+25°F) and fall may transition from below freezing to above freezing temperatures in the future (UAF/SNAP 2024a- Northern Climate Reports). Statewide, by 2046, the number of nights with below freezing temperatures is expected to decrease by at least 20 nights per year (USGRCP 2018).
Freezing Rain and Ice Storms	Freezing rain and ice storm events are dependent on the ambient air mass temperature. Average annual temperatures in Alaska are projected to rise by an additional 2°F to 4°F by 2050 (USGCRP 2018; UAF/SNAP). As global temperatures continue to rise, freezing rain and ice storm events may become less frequent as in previous decades.
Heavy Snow	The snowfall season is expected to decrease across Alaska, with snowpack decreasing by 20–90% in Southern and Western Alaska due to increasing temperatures (USDA 2024).

Severe Weather Event	Projected Changes in Probability of Future Events due to Climate Change
	Models indicate a broad switch from snow-dominated to transitional annual hydrology across most of Southern and Coastal Alaska (Littell et al. 2018). 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.
Drifting Snow	Projected climate change impacts are expected to reduce snowpack (NPS 2020), while high-wind events are projected to become more frequent, especially in northern and western Alaska coastal regions (Redilla et al. 2019). How these competing factors will affect the probability of drifting snow events in Wales is unknown. While unknown, the probability of drifting snow events will depend on the geography of the area and predisposition for snowfall.
Blizzard	Climate scientists have suggested that warming global temperatures may be enabling longer, more frequent, and more intense cycles of winter storms and blizzards (Dixon et al. 2018).
Winter Storm	Climate scientists have suggested that warming global temperatures may be enabling longer, more frequent, and more intense cycles of winter storms (Dixon et al. 2018).
Heavy Rain	In Wales, winter precipitation may increase by 53% by the end of the century (UAF/SNAP 2024a- Northern Climate Reports).
High Winds	High-wind events are projected to become more frequent (Redilla et al. 2019).
Drought	Climate change within Alaska is likely to result in increased frequency of drought conditions (IPCC 2019). Drought risks will increase globally throughout the end of the 21st century, scaling upwards with emissions projections/additional degrees of heating. In the high latitudes of North America, droughts will be 150-200% more likely at 2°C warming and over 200% more likely at 4°C warming (IPCC 2019).
Population Patterns	Due to the location of severe weather hazards in the Wales planning area, it is possible to impact future population patterns.
Land Use Development	Due to the location of severe weather hazards in the Wales planning area, it is possible to impact future land use development.

3.3.3 WILDLAND/TUNDRA FIRE

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 (Community Fire)**: 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.

Both wildland/tundra and community fires pose a risk to the residents and infrastructure in Wales. For this HMP, these fires will be described as wildfires.

3.3.3.1 Nature

Wildland fires are types of fires which spread via the consumption of vegetation, and they often spread very quickly due to amount of vegetation available. Tundra fires are more specific, as they occur on the Bering tundra, where Wales is located.

They begin sometimes unnoticed and cause dense smoke that is usually visible from several miles or tens of miles around. Two principal causes for them are natural (e.g., lightning) and by 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. Climate change is 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 or droughts, can lead to extensive wildfire activity. Dry seasons are generally becoming longer due to climate change, 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 as well.
- **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 if 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 have an effect on 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 swathes 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.

3.3.3.2 History

Wildland fires occur in every state in the country, including all regions of Alaska. Each year, between 600 and 800 wildland fires, mostly between March and October, burned across Alaska, causing extensive damage.

Table 14 lists historical wildfires with 100 miles of Wales. None of these fires occurred in the community or impacted the residents. The Planning Team states that smoke from distant fires has impacted the air quality in the Village.

Table 14- Historical Wildfires within 100 miles of Wales (1939-2023)

Discovery Date	Fire Name	Latitude	Longitude	Total Acres Burned	Cause
6/4/1954	Imuruk Basin	65.0000	-165.0000	224,000	Lightning
8/13/1959	Teller Mission W-2	65.3333	-166.5000	12	Children
6/3/1961	Koyuk	65.2000	-166.9333	400	Natural
7/23/1964	Teller Rd	64.7833	-165.4667	1	Human
8/8/1964	Kougarok	65.4167	-164.6667	25	Natural
9/5/1970	Surprize	65.0500	-164.9833	10	Camping
6/24/1971	Seabert	65.4000	-165.5333	1,000	Lightning
6/24/1971	Little Ptarmigan I	65.2667	-165.8333	800	Lightning
6/24/1971	Little Ptarmigan Ii	65.2500	-165.8333	100	Lightning
6/26/1971	New Igloo	65.1667	-165.1167	3,600	Lightning
6/26/1971	165-30	65.3000	-165.5000	58,520	Lightning
6/26/1971	Tuksuk Channel	65.2559	-165.6751	20,480	Lightning
6/26/1971	Officid Creek	65.2500	-166.0000	399	Lightning
6/29/1971	Anc Nw 500	65.3333	-164.8333	100,000	Lightning
6/29/1971	Coffee Dome	65.2500	-164.7500	500	Lightning
7/13/1972	Henry Creek	65.4700	-164.9742	800	Unknown
6/30/1973	Taylor	65.6697	-164.8700	320	Lightning
8/3/1973	Kingegan	65.6144	-167.9836	10	Unknown
8/6/1974	Burke	64.6833	-165.4833	1	Lightning
9/8/1974	Taylor	65.8000	-164.7667	766	Unknown
7/23/1977	Shishmaref	66.0287	-165.5402	50	Lightning
7/24/1977	Shh Se 38	65.9000	-165.0000	20,000	Lightning
7/24/1977	Shh Se 26	65.9821	-165.4357	2,500	Lightning
7/24/1977	Shh Corral	66.1104	-165.6328	0	Lightning
8/31/1978	Shelton	65.2406	-164.8753	75	Lightning
6/24/1982	Shh Se 12	66.0885	-165.6759	6	Natural
6/26/1982	Ome N 50	65.2833	-165.9167	0	Natural
6/26/1982	Ssh S 20	65.9397	-166.3124	55	Natural
7/22/1983	Ome N 90	65.8833	-166.2667	5	Natural
6/25/1984	Ome Ne 40	65.1000	-165.9699	20	Lightning
7/14/1985	Otz Sw 95	65.6333	-164.8500	40	Lightning

Table 14- Historical Wildfires within 100 miles of Wales (1939-2023)

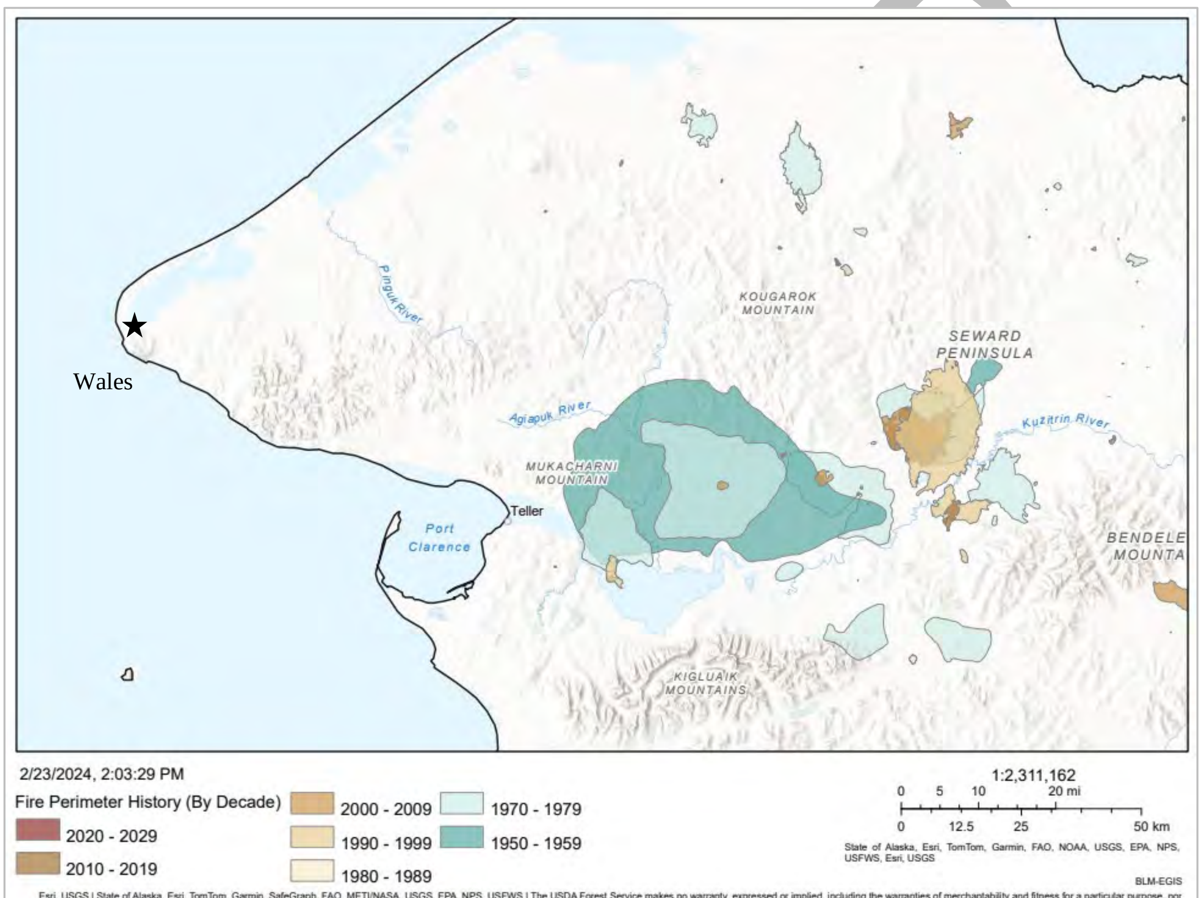
Discovery Date	Fire Name	Latitude	Longitude	Total Acres Burned	Cause
7/17/1985	Ome 35 N (531050)	65.0500	-164.9167	10	Lightning
8/5/1985	531055	65.8509	-165.0232	500	Unknown
7/8/1986	Ome N 45	65.2443	-165.7014	2	Lightning
8/4/1990	Ome W 25	64.4833	-166.2000	4	Trash Burning
9/2/1991	Ome N 85	65.7167	-164.8333	55	Other
9/2/1991	Lil Diomede	65.7500	-168.9333	3	Children
6/21/1992	231280	64.7500	-165.9333	80	Other
7/5/1992	Qrz Ssw 21	65.0500	-164.9500	3	Lightning
7/5/1992	Qrz Ssw 20	65.0500	-165.0000	1	Lightning
7/6/1992	Qrz N 45	66.0333	-164.8500	36	Lightning
9/23/1992	No Name	64.7500	-165.9333	5	Field Burning
8/12/1993	Shhsw22	65.9833	-166.8667	0	Smoking
6/11/1994	Ome Nw 60	65.1667	-165.8500	3,200	Lightning
8/2/1997	731682	65.8333	-164.9833	5	Lightning
7/13/2000	Ring Creek	65.1167	-166.2667	1	Lightning
7/13/2000	Lucky Strike	65.1833	-166.1500	35	Lightning
8/12/2002	Imuruk Basin	65.1486	-165.8967	381	Human
6/25/2003	Hunter Creek	65.3244	-165.3905	519	Lightning
6/13/2004	Quartz Creek	65.4000	-164.7000	37	Lightning
6/13/2004	Quartz Creek #3	65.3000	-164.8000	80	Lightning
6/13/2004	Quartz Creek #2	65.3333	-164.8333	1,648	Lightning
7/26/2005	Black Creek	65.4167	-165.6422	0	False Alarm
7/26/2005	South Agiapuk	65.4189	-165.6447	67	Lightning
7/13/2007	Snow Shoe Creek	65.8761	-165.3906	39	Lightning
7/14/2007	Serpentine River	66.0364	-165.0633	1	Lightning
7/14/2007	Hill Creek	65.9269	-166.0294	2	Lightning
8/8/2014	Artic River	65.8333	-166.1667	70	Lightning
8/8/2014	Teller Creek	65.7667	-165.1167	200	Lightning
7/23/2015	Coco Creek	65.3881	-165.1305	180	Lightning
8/13/2016	Pilgrim FA 15	65.0833	-164.9833	0	False Alarm
6/6/2018	False Alarm 6	65.1667	-166.4167	4,451	Unknown
6/13/2018	Wander Gulch	65.3268	-164.7625	59	Lightning
6/13/2018	Camp Creek	65.3143	-164.7777	68	Lightning
7/5/2018	Winter Creek	65.3453	-164.9369	15	Lightning
6/20/2019	Imuruk Basin	65.1803	-165.1604	0	Lightning
6/20/2019	Sango Creek	65.9305	-165.8432	128	Lightning
7/8/2019	Ptarmigan Creek	65.2904	-164.9577	1	Lightning
7/8/2019	Hooligan Creek	65.2895	-164.9011	30	Lightning

Table 14- Historical Wildfires within 100 miles of Wales (1939-2023)

Discovery Date	Fire Name	Latitude	Longitude	Total Acres Burned	Cause
6/3/2020	Coffee Dome	65.2969	-164.7310	21	Lightning
6/3/2020	Macklin	65.7419	-164.8744	268	Lightning
6/22/2021	American River	65.5191	-165.6426	13	Lightning

Source: AICC 2024

Figure 27 depicts the perimeters of historic wildfire fires near Wales (1940-2023).



Source: AICC 2024

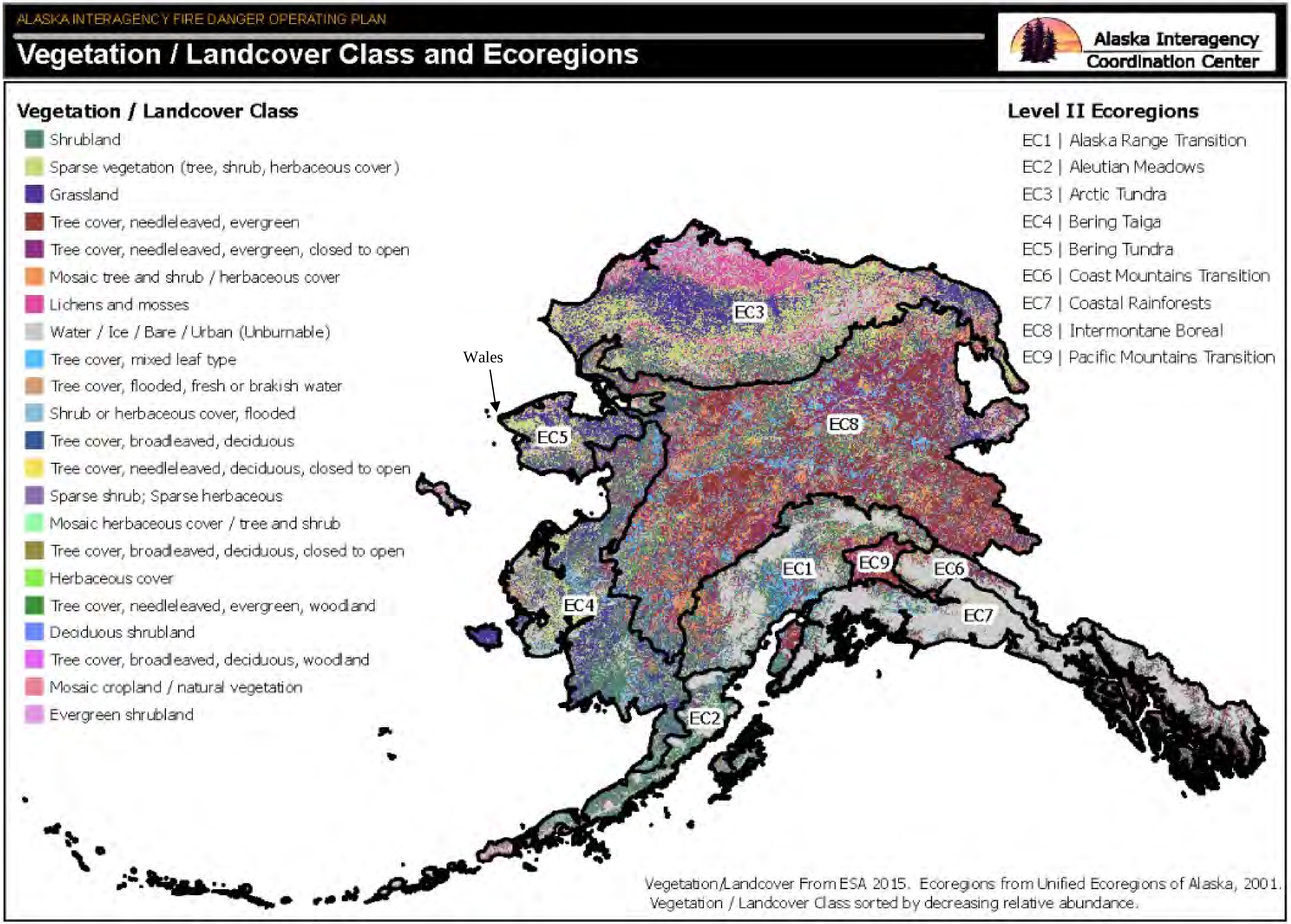
Figure 27- Historical Wildfire Perimeters near Wales (1940-2023)

3.3.3.3 Location

Figure 28 depicts the Level II Ecoregion classifications and the vegetation/landcover classes found throughout the State.

Wales is located in the EC5 Level II Ecoregion which is classified as Bering Tundra. The Seward Peninsula is a predominantly treeless region and the vegetation/landcover class of this region is primarily made up of sparse vegetation containing trees, shrubs, and herbaceous cover.

Ecoregion EC5 has a low fire load, but fires do happen under favorable conditions. Mainly short lived as moisture frequently impacts the west coast. However, with certain combinations of fuel availability, weather, topography, and sources of ignition, wildland fires may occur near Wales.



Source: BLM 2020

Figure 28- Vegetation/Landcover Class and Ecoregions of Alaska

Figure 32 shows the historical and future flammability of Wales. This region has historically had Very Low flammability and is projected to continue to have Very Low flammability through 2099 under both emissions scenarios.

3.3.3.4 Extent (Magnitude and Severity)

Due to the few recorded historical wildland fire events as well as the criteria listed in Table 6, the extent of wildland/tundra fire events in Wales have been Negligible with minor injuries, the potential for critical facilities to be shut down for less than 24 hours, less than 10% of property or critical infrastructure being severely damaged, and little to no permanent damage to transportation or infrastructure or the economy.

3.3.3.5 Impact

If wildfires are not adequately controlled, the impacts from them could become an emergency or considerable disaster. Even smaller wildfires can threaten lives, resources, and destroy properties. Livestock and pets are susceptible to wildfires as well. Wildfires can precipitate the need for emergency food and water, evacuation, and temporary shelters.

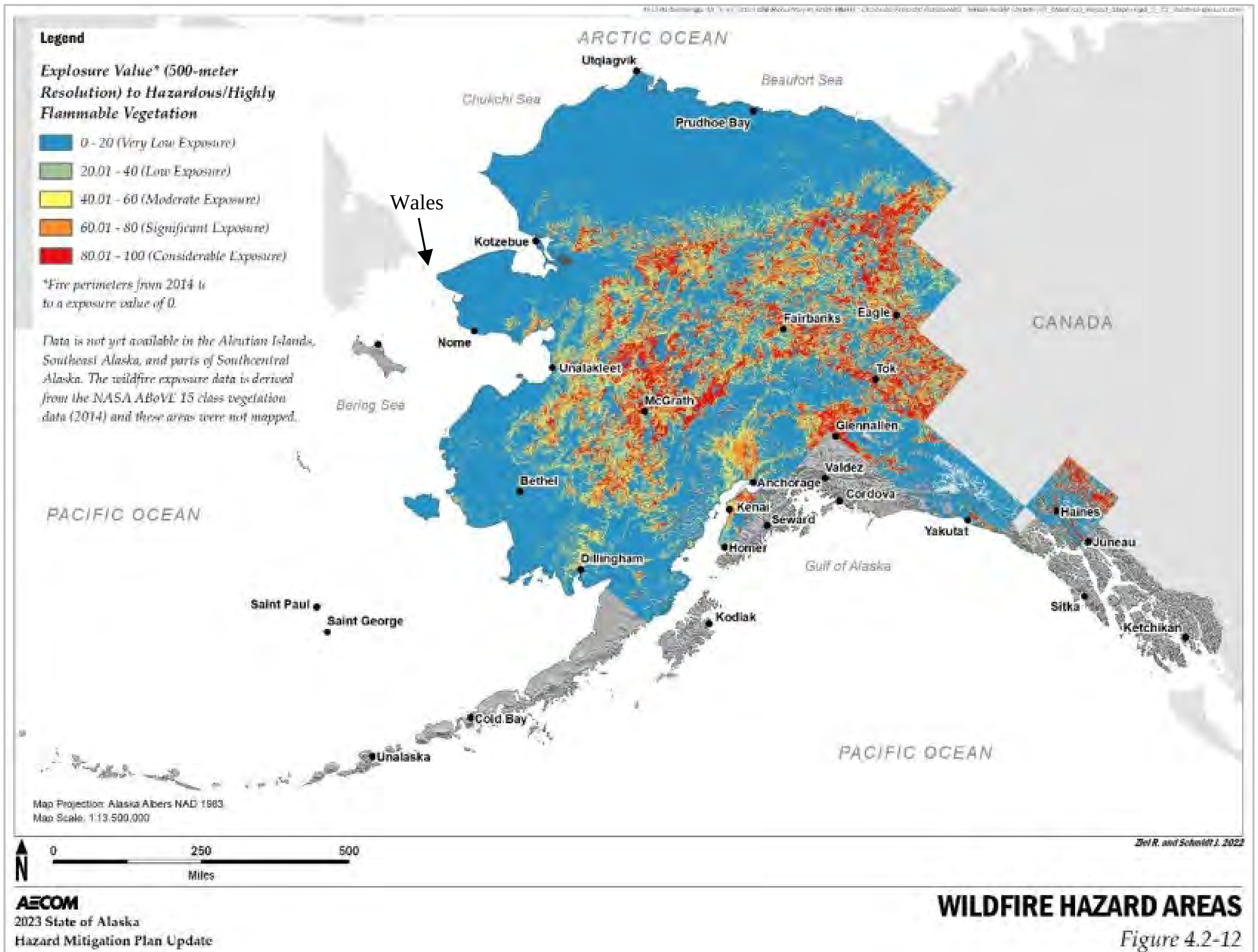
The effects of wildland fires can become catastrophic. They can destroy large swathes of forest and other vegetation, damage the soil, waterways, and the land itself. Some soils may lose their capacity to keep moisture and support life for years after an intense wildfire. Exposure of the land also leads to increased erosion and add to the siltation of rivers and streams. This increases the chances of flooding, degrades water quality, and can significantly harm aquatic life.

For many ecosystems, wildfires are actually critical features of the natural history. They can serve to help maintain renewal, biodiversity, and the ecological health of the land in general. This essential role which they serve for the local ecology has been incorporated into the planning process for fire management. Hence, the full range of fire management activities has been implemented in Alaska. This helps achieve the sustainability and health of the ecosystem. This includes the social consequences on firefighters in addition to ecological and economic factors. The natural and cultural resources that are potentially threatened, and other important values, all dictate the level and nature of the management response during a wildfire.

Wales has not been severely impacted by historical wildland fires. Secondary impacts have been a result of decreased air quality from smoke from distant fires.

3.3.3.6 Probability of Future Events

The 2023 State of Alaska SHMP identifies wildfire hazard areas across the State (Figure 29). Wales is located in an area with very low exposure value.



Source: DHS&EM 2023

Figure 29- Statewide Wildfire Hazard Areas

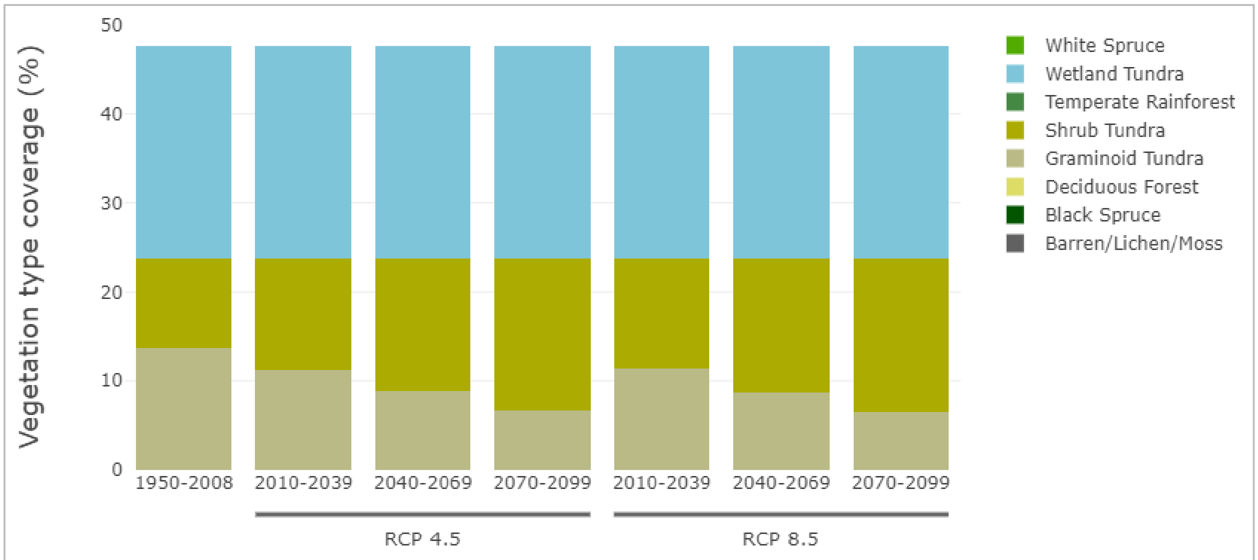
Based on previous occurrences and the criteria identified in Table 7, it is Unlikely that Wales will experience a wildland fire event in the next ten years. The event has up to 1 in 10 years chance of occurring (1/10=10%) and the history of events is less than or equal to 10% likely per year.

There is Code Red equipment for firefighting needs in Wales if they were to be impacted by a fire.

3.3.3.7 Future Conditions Including Climate Change

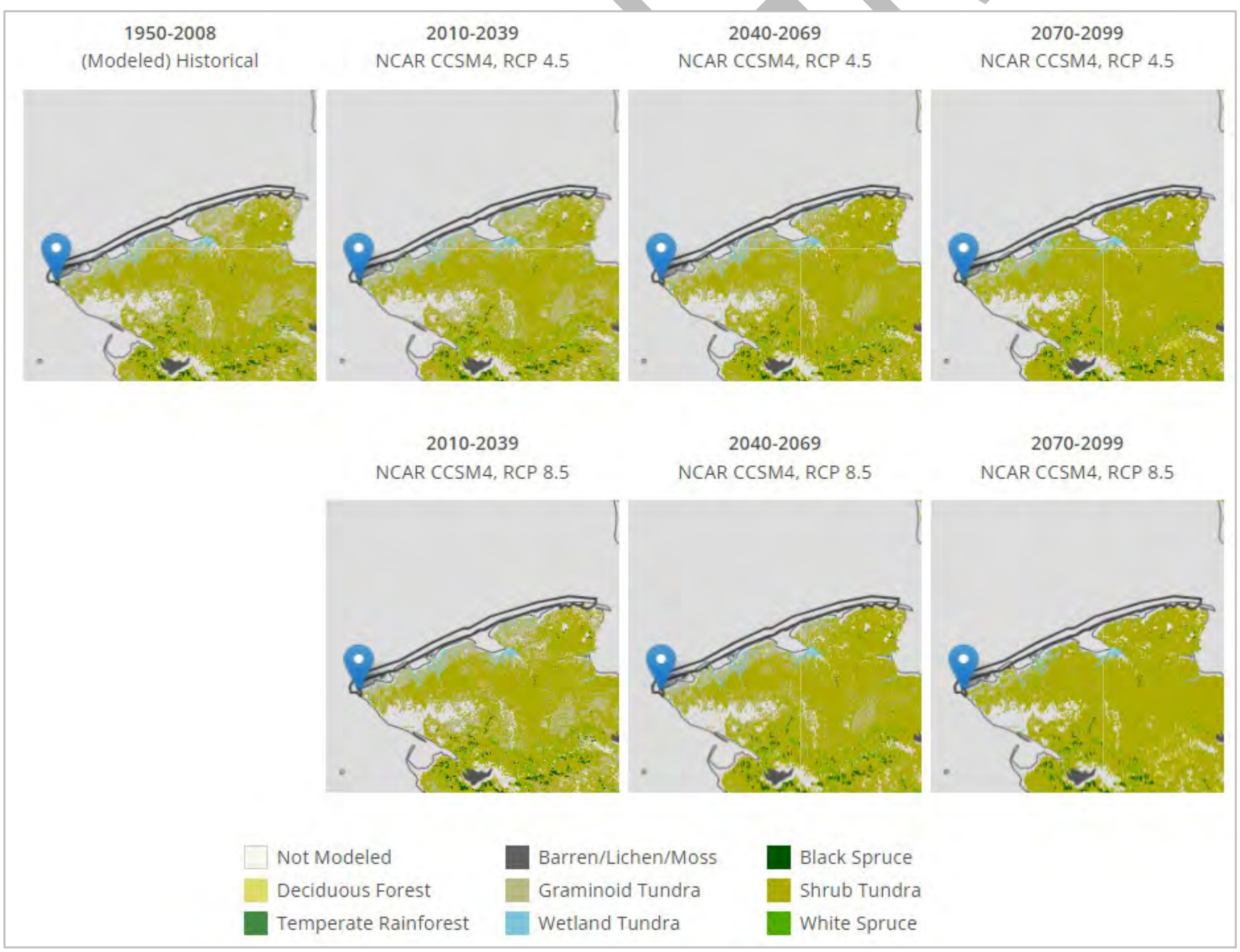
Figure 30 shows historical and projected changes in vegetation in Wales from 1950 through year 2099 using the NCAR CCSM4 model, with the same data represented in the form of a map in Figure 31. Future projections (2010-2099) are shown under two different scenarios of differing Representative Concentration Pathways (RCP), which is the trajectory of greenhouse gas concentrations in the atmosphere. Compared to current emissions, RCP 4.5 is a scenario representing a reduction in global emissions, while RCP 8.5 represents a scenario similar to, or possibly higher than, current global emissions trajectories.

In Wales, the predominant vegetation type is currently Wetland Tundra, followed by Shrub Tundra, and Graminoid Tundra (UAF/SNAP 2024a- Northern Climate Reports). Under both emission scenarios, this model does not predict a change in coverage of Wetland Tundra in the future, but predicts an increasing coverage amount of Shrub Tundra and a decreasing among of Graminoid Tundra in Wales.



Source: UAF/SNAP 2024a- Northern Climate Reports

Figure 30- Historical and Projected Changes in Vegetation Type Coverage in Wales

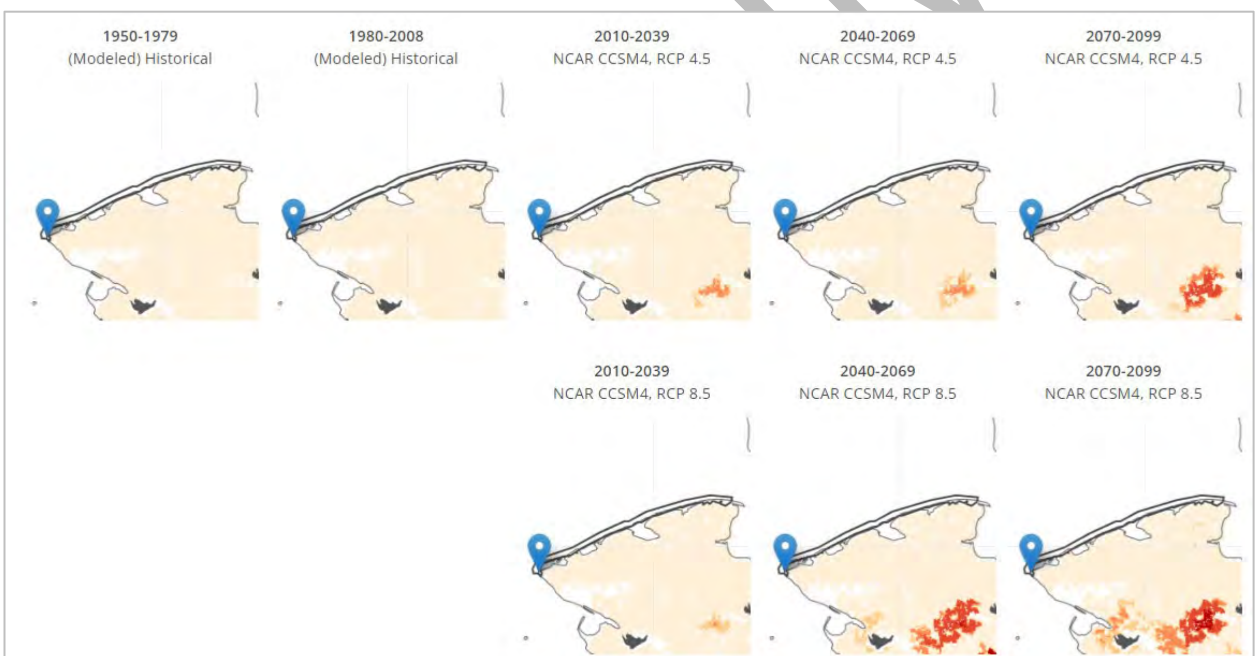


Source: UAF/SNAP 2024a- Northern Climate Reports

Figure 31- Projected Changes in Vegetation in Wales

Figure 32 depicts historical and future projections of the flammability in Wales using the NCAR CCSM4 model. This region has historically had Very Low flammability and future flammability is projected to stay the same through 2099 under both emissions scenarios (UAF/SNAP- Northern Climate Reports).

Category	Flammability	Interpretation
Not modeled or no data	-	This pixel was not modeled or is not included in the dataset
Very Low	<0.2%	Fire is absent or very rare
Low	≥0.2%, <0.5%	Fire is rare, and unlikely to be the primary driver of vegetation patterns on this landscape
Moderate	≥0.5%, <1%	Fire is frequent enough to partially define the vegetation patterns on this landscape
High	≥1%, <2%	Fire is more frequent and more dominant in determining vegetation patterns on this landscape
Very High	≥2%	Fire is highly frequent and dominates the vegetation patterns on this landscape



Source: UAF/SNAP 2024a- Northern Climate Reports

Figure 32- Historical and Projected Flammability Conditions for Wales (1950-2099)

Due to climate change, the nature or location of future wildland fires in Wales are not anticipated to change.

Changing Factor due to Climate Change	Description of Future Changes due to Climate Change
Extent (Magnitude and Severity)	Due to climate change, the extent (magnitude and severity) of wildland fires is expected to increase. 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).

Changing Factor due to Climate Change	Description of Future Changes due to Climate Change
	Wales is surrounded by Bering Tundra, and has historically not been directly impacted by wildland/tundra fires. Most impacts to the community are a result of decreased air quality from smoke from distant fires.
Impact	Due to climate change, the impact of wildland fires to Wales may increase. A warmer, drier spring weather may increase fire risk and resulting in increased impacts, including smoke and air quality, from distant fires (UAF/SNAP).
Probability of Future Events	Wildfires are a natural disturbance in boreal forest and, more unusually, tundra ecosystems in Alaska. However, rapidly warming temperatures and extended dry periods in spring and summer increase the risk of large, severe wildfires that can threaten lives, infrastructure, and resources. Warmer, drier summers have increased the frequency of large fires over the last 20 years, including reburns of recently burned areas. By 2050, burned area is projected to increase 24 to 169% in Alaska (USDA 2024).
Changes in population patterns	Due to the location of wildland and community fire hazards in the Wales planning area, it is possible to impact future population patterns.
Changes in land use development	Due to the location of wildland and community fire hazards in the Wales planning area, it is possible to impact future land use development.

3.3.4 CHANGES IN THE CRYOSPHERE

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 33). The components of the cryosphere play an important role in 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 are able to identify global climate change.

Hazards of the cryosphere can be subdivided into four major groups: Glaciers, Permafrost, Sea ice, Snow avalanches. Of these four major groups, all but glaciers pose a threat to Wales.

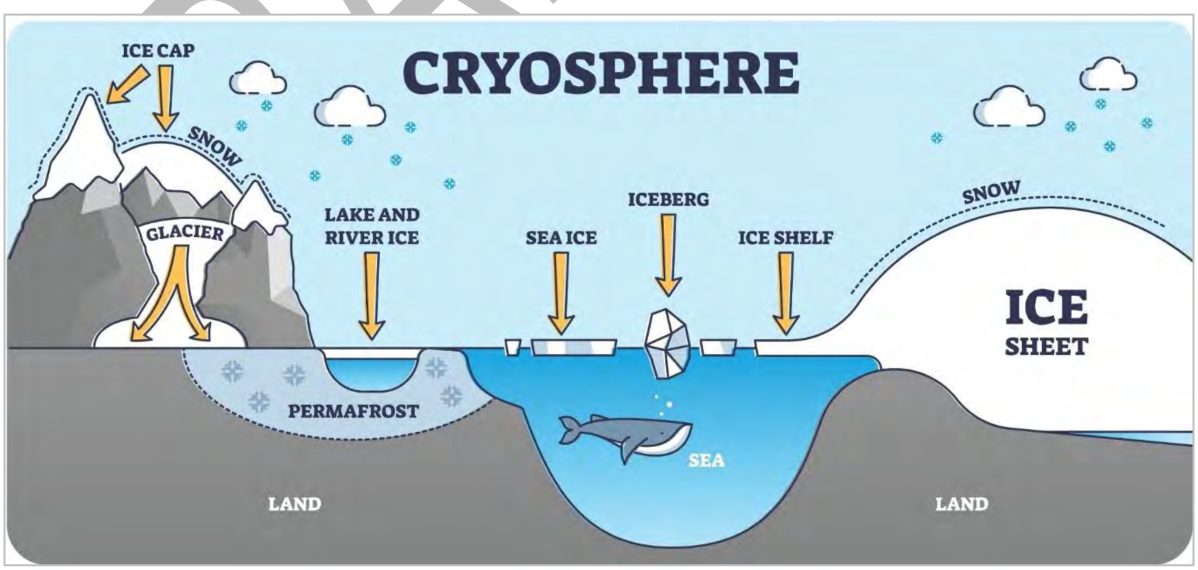


Figure 33- Components of the Cryosphere

3.3.4.1 Permafrost Degradation

Nature

Permafrost, defined as ground with a temperature that remains at or below freezing (32°F or 0°C) for two or more consecutive years, can include rock, soil, organic matter, unfrozen water, air, and ice.

Permafrost hazards are caused by the effects of changing perennially frozen soil, rock, or sediment (permafrost) and the landscape processes that result from extreme seasonal freezing and thawing.

In the U.S., the presence of widespread permafrost results in classes of geologic hazards, which are largely unique to Alaska. Permafrost is structurally important to the soils of Alaska, and thawing causes landslides, ground subsidence, and erosion as well as lake disappearances, new lake development, and saltwater encroachment into aquifers and surface waters.

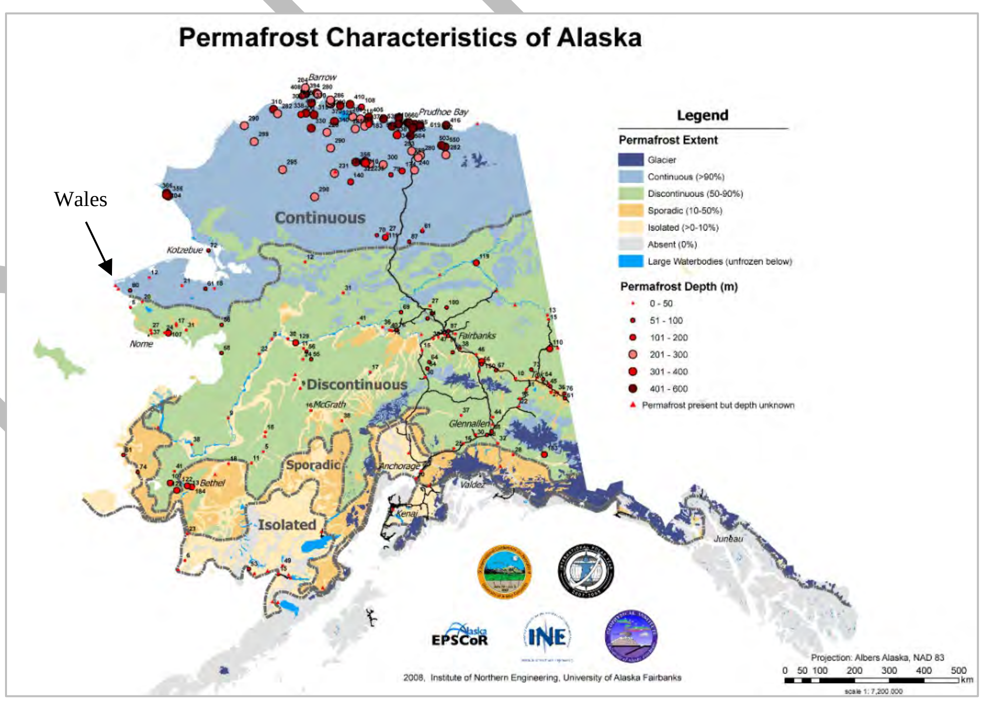
History

In Wales, permafrost degradation is leading to subsidence throughout the community.

Location

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 except for patches of high-elevation alpine permafrost.

According to Permafrost Characteristics Map of Alaska (Figure 34) developed for the National Snow and Ice Data Center/World Data Center for Glaciology, Wales has **continuous permafrost** (Jorgensen et al. 2008).

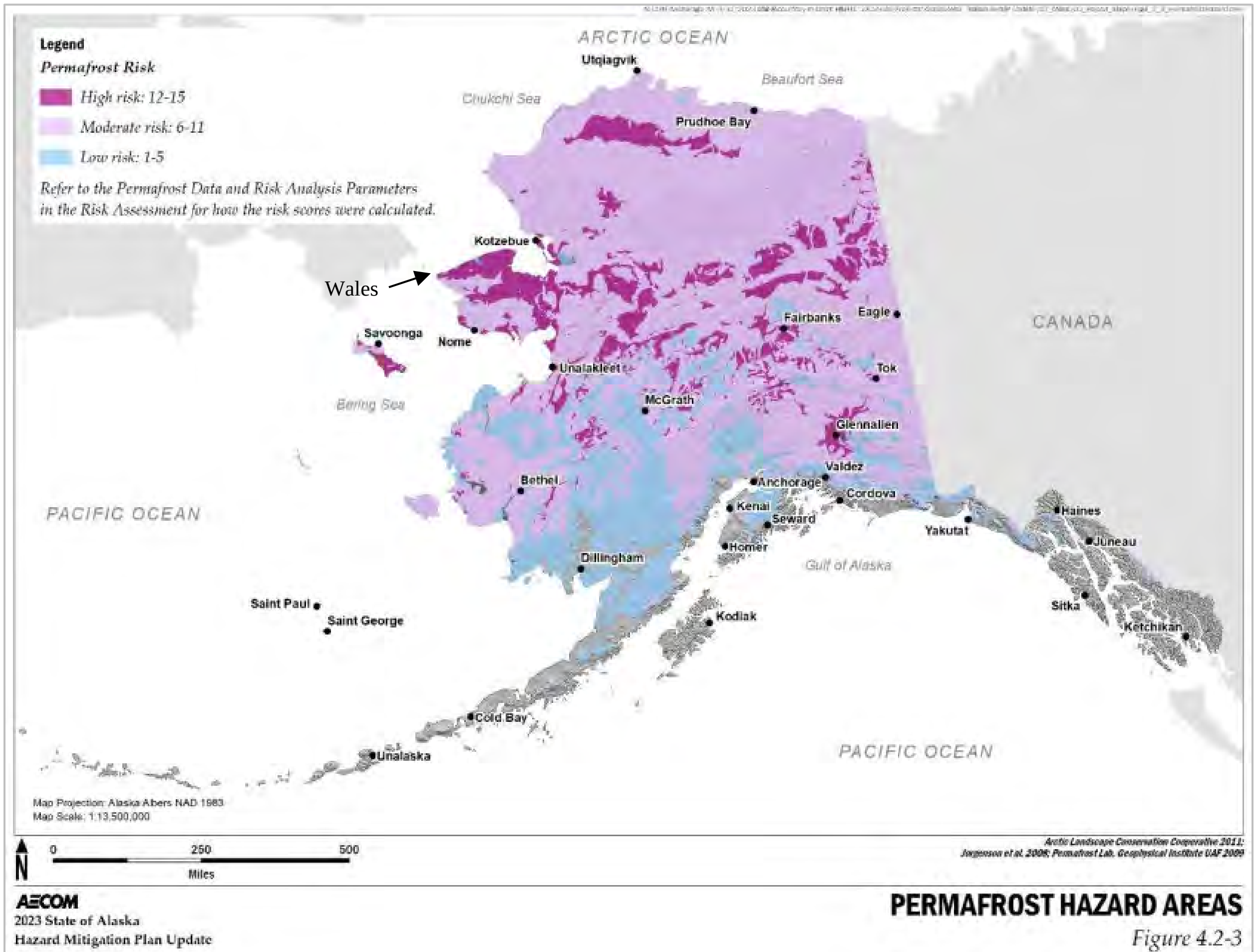


Source: Jorgenson et al. (2008)

Figure 34- Permafrost Characteristics of Alaska

The 2023 State of Alaska SHMP identifies statewide permafrost hazard areas (Figure 35). Wales is located in an area with **high permafrost risk**.

Subsidence due to permafrost thaw is evident in Wales. Subsidence is occurring on their traditional subsistence areas and trails and along the road to Tin City, another subsistence location for residents. Permafrost thaw is also leading to foundation sinking of homes in Wales.



Source: DHS&EM 2023

Figure 35- Statewide Permafrost Hazard Areas

Extent (Magnitude/Severity)

UAF/SNAP profiled permafrost characteristics and associated risks and hazards in rural Alaskan communities. The permafrost profile and risk level for Wales is outlined inFigure 36.

Wales is located in an area that has historically had **continuous permafrost**.

Based on past event history and the criteria identified in Table 6, the extent of permafrost hazards and resultant damages to people and infrastructure in Wales are considered Critical, where injuries and/or illnesses could result in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property is severely damaged.

Note: general confidence for this analysis is low due to no reports with ground-ice data or an existing HMP. Estimation is based on general information on surficial geology and permafrost occurrence and analysis of available imagery.
Source: UAF/SNAP 2024f- Community Permafrost Data

Figure 36- Wales Permafrost Profile/Risk

Impact

Impacts associated with permafrost degradation include surface subsidence, and infrastructure, building, and/or road damage. In developed areas, ground failure as a result of thawing permafrost can be a result of improperly designed and constructed buildings, or buildings built on top of permafrost, and may impact buildings, communities, pipelines, airfields, roads, and bridges. This has the potential for extensive structure loss or costly repairs.

In Wales, subsidence is occurring on their traditional subsistence areas and trails and along the road to Tin City, another subsistence location for residents. Permafrost thaw is also leading to foundation sinking of homes in Wales.

Probability of Future Events

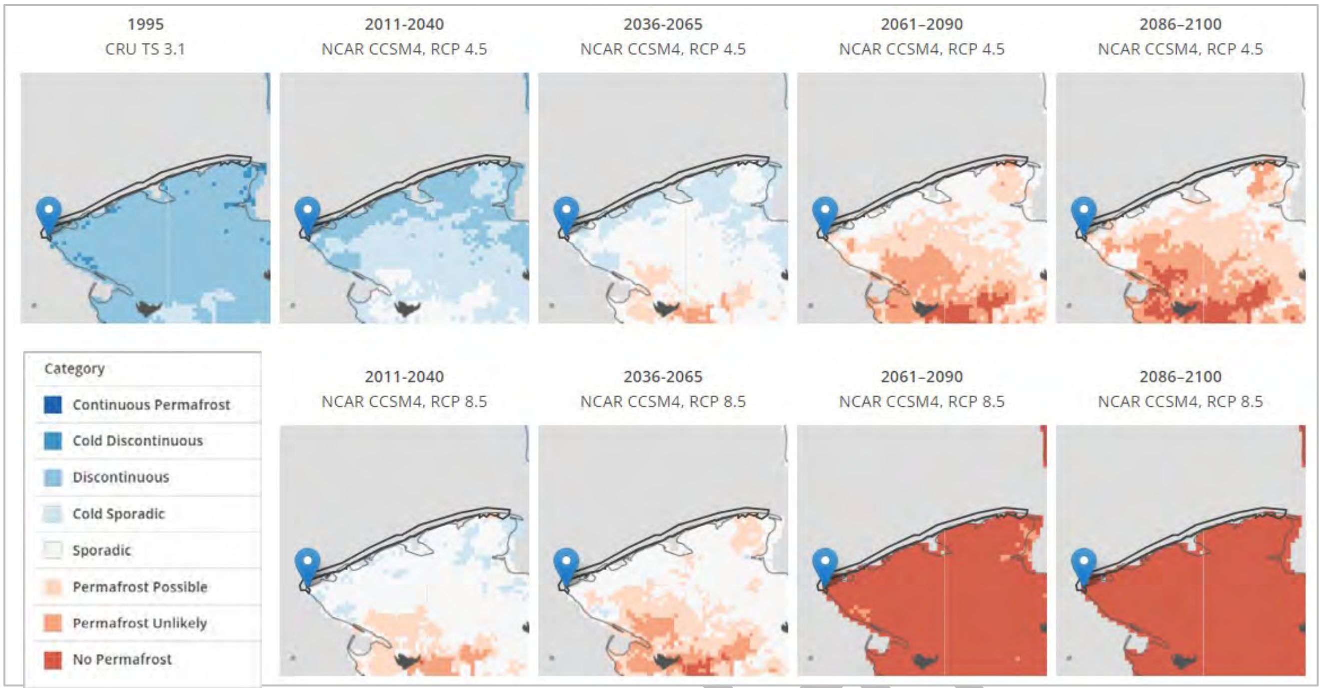
Climate models project that permafrost in Alaska will continue to thaw, and some models project that near-surface permafrost will be lost entirely from large parts of Alaska by the end of the century (USGCRP 2018). See Figure 37 for projections of future ground temperature and permafrost conditions in Wales.

Based on previous occurrences and the criteria identified in Table 7, it is Highly Likely that Wales will experience a permafrost degradation hazard 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 Conditions Including Climate Change

Permafrost Degradation	
Changing Factor	**Description of Changes Due to Climate Change**
Nature	Climate change is not anticipated to influence the nature of permafrost hazards in Alaska.

Permafrost Degradation	
Changing Factor	**Description of Changes Due to Climate Change**
Location	Climate change will impact permafrost locations across Alaska, but the most drastic changes will be seen in the northern/Arctic regions of the state.
Extent	Climate models project that permafrost in Alaska will continue to thaw, and some models project that near-surface permafrost will be lost entirely from large parts of Alaska by the end of the century (USGCRP 2018).
Impact	Impacts associated with permafrost degradation include surface subsidence, infrastructure, building, and/or road damage. Subsidence can be a result of improperly designed and constructed buildings, or buildings built on top of permafrost, and may impact buildings, utilities, pipelines, airfields, roads, and bridges. This has the potential for extensive structure loss or costly repairs. Additionally, in areas with permafrost degradation, the frequency and potential of rock falls or rock avalanches has increased (IPCC 2019). Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from thawing permafrost and glacial decline (IPCC 2019). In Wales, thawing permafrost will continue to lead to subsidence throughout the community.
Probability of Future Events	Climate models project that permafrost in Alaska will continue to thaw, and some models project that near-surface permafrost will be lost entirely from large parts of Alaska by the end of the century (USGCRP 2018). Figure 37 shows historic and projected average annual ground temperature in Wales. Wales has historically had continuous permafrost. Due to climate change, the permafrost profile in Wales is expected to change, but projections of category type change based on climate scenario.
Changes in population patterns	Due to the location of permafrost hazards in the Wales planning area, it is possible to impact future population patterns.
Changes in land use development	Due to the location of permafrost hazards in the Wales planning area, it is likely to impact future land use development.



Source: UAF/SNAP 2024a- Northern Climate Reports

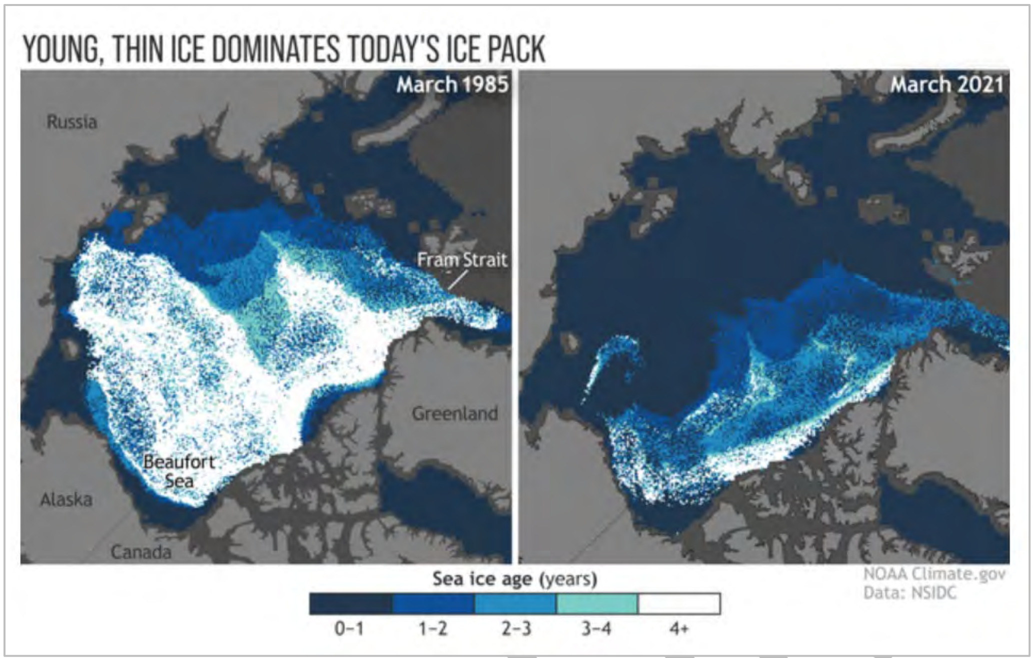
Figure 37- Mean Annual Ground Temperature in Wales (1995-2100)

3.3.4.2 Sea Ice Extent

Nature

Ice in the Arctic environment consists of shorefast "fast" ice and floating or "pack ice". Pack ice persists year-round in the Arctic, while fast ice forms each winter and melts during the short Arctic summer. All sea ice is dynamic and mobile, and subject to dispersal by winds and currents and open water may persist year-round.

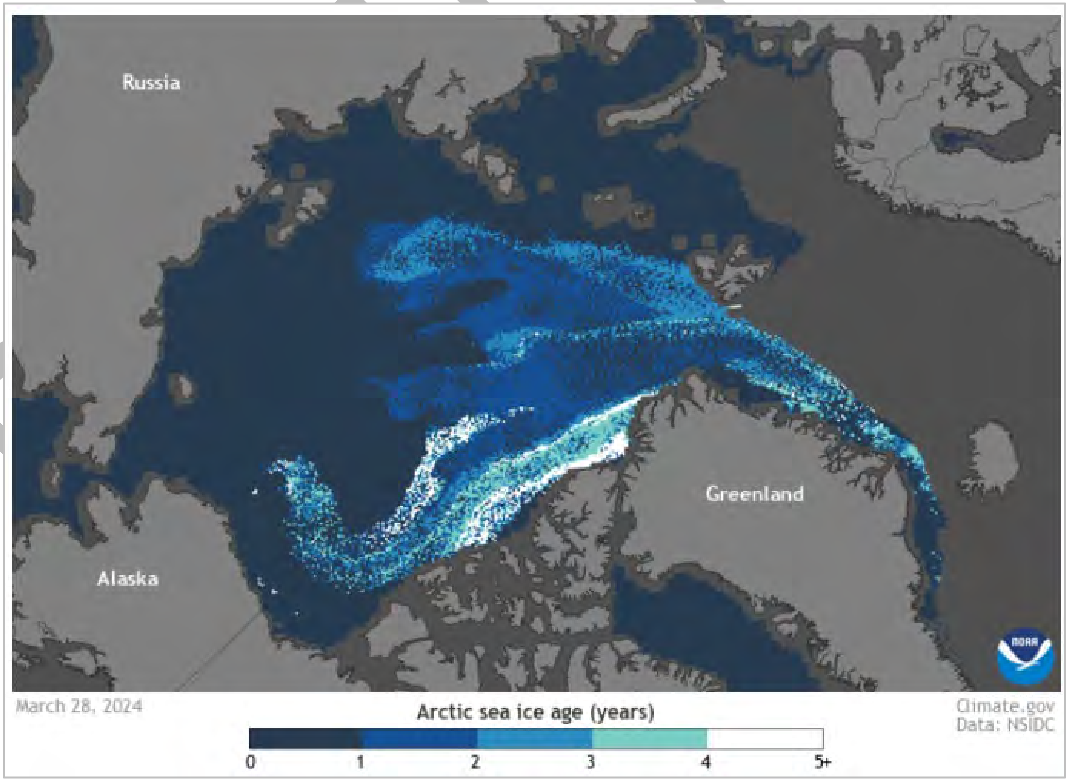
Sea ice can be described by its age, which is when the ice formed. First-year ice formed during the most recent winter and 2-year-old ice formed two winters ago, and so on. Ice thickness is strongly correlated with ice age. First year ice ranges from 4 to 12 inches thick, while multi-year ice ranges from 6 to 12 feet thick. This correlation means that older ice is typically thicker than younger ice.



Source: NOAA 2021

Figure 38- Age of Arctic Sea Ice in 1985 vs. 2021

Figure 39 shows the age of sea ice in the Arctic on March 28, 2024- note that the majority of ice is between 0-3 years old.

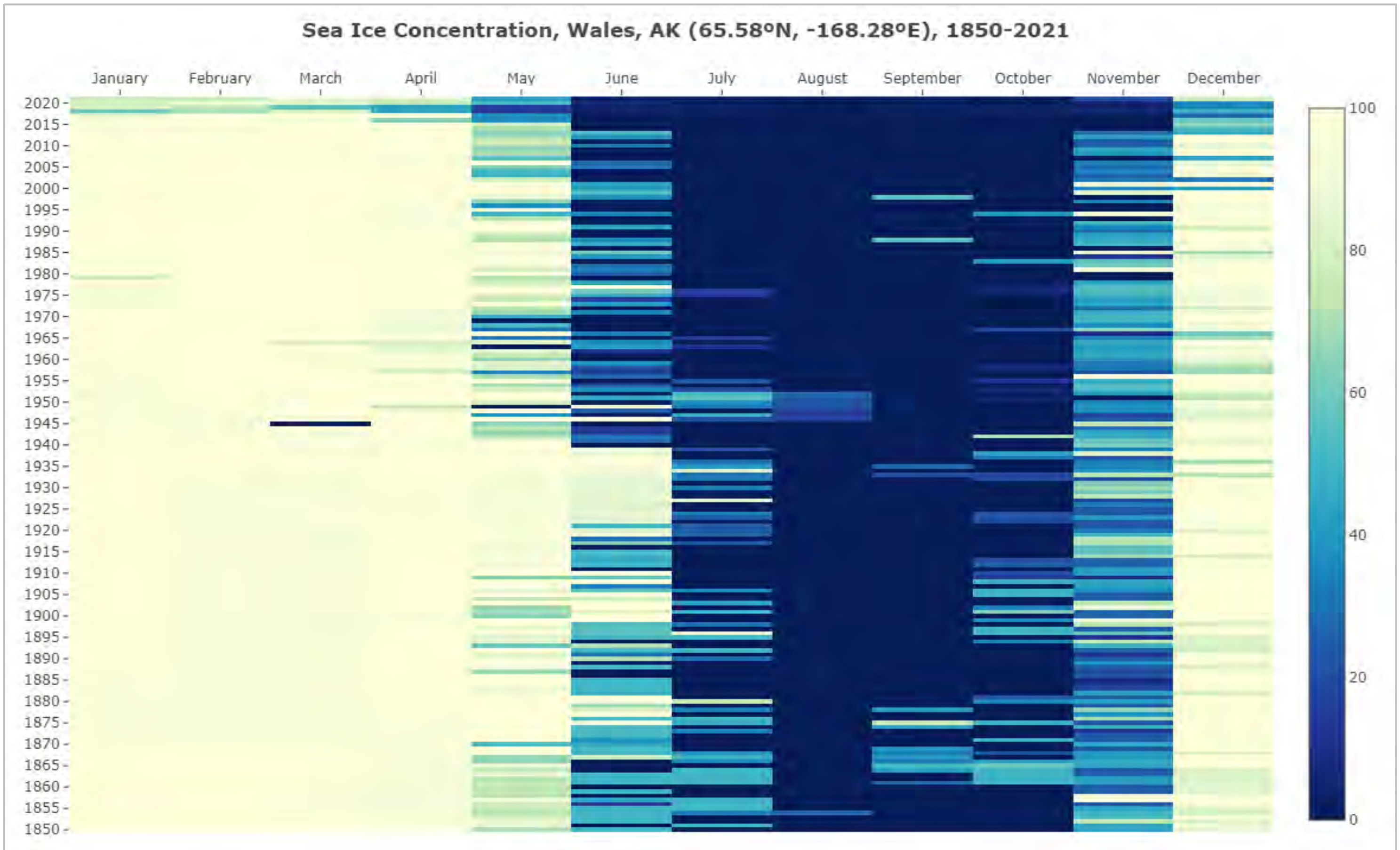


Source: NOAA 2023a

Figure 39- Age of Arctic Sea Ice on March 28, 2024

History

The historical sea ice extent in Wales from 1850-2021 is shown in Figure 40 and shows decreasing sea ice in recent years.



Note: Dark blue represents 0% ice, or open water. Light yellow represents 100% solid ice
Source: UAF/SNAP 2024- Historical Sea Ice Atlas

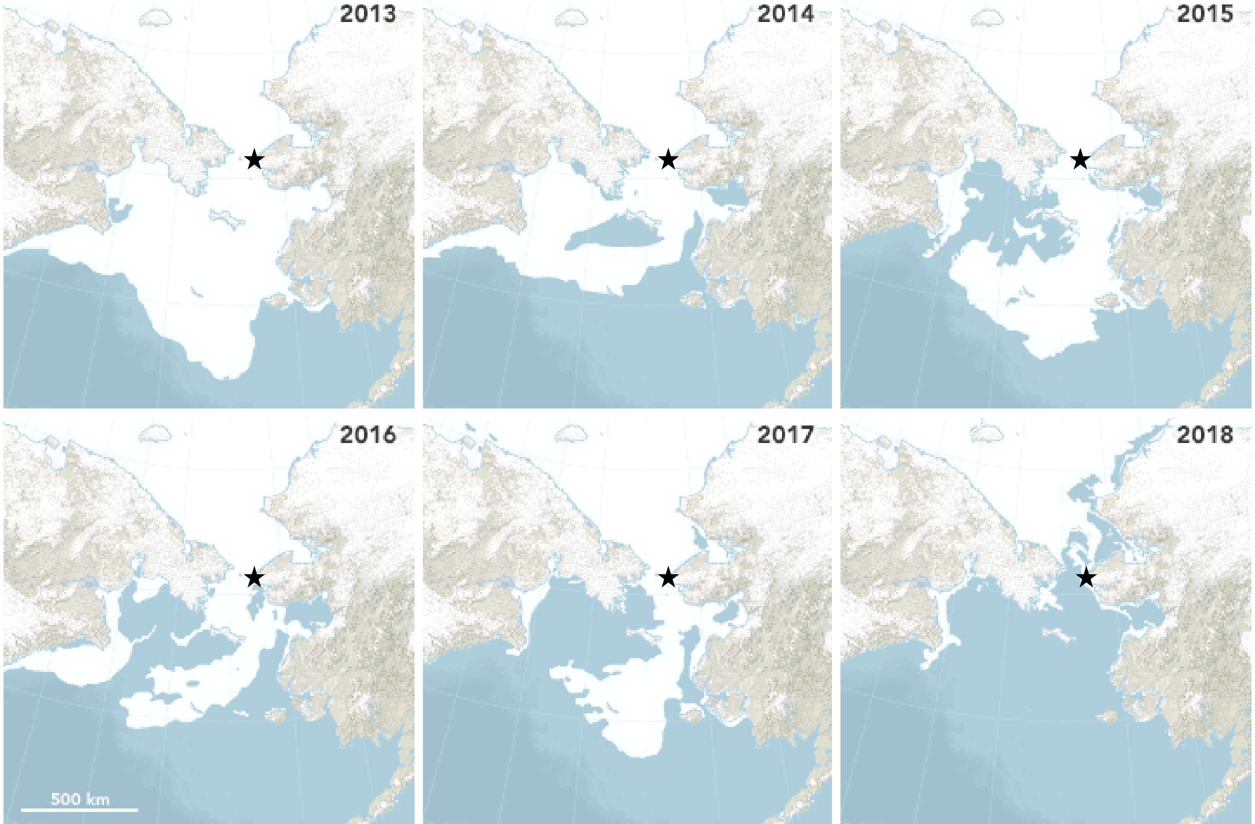
Figure 40- Historical Sea Ice Concentration in Wales (1850-2021)

Location

The Bering Sea experiences seasonal formations of shorefast ice in Wales.

From 2006-2009, the Sea Ice Group at the Geophysical Institute at UAF operated a coastal ice observatory in Wales, equipped with a coastal webcam and radar (UAF 2009). The webcam in Wales was mounted on top of the Kingikmiut School at the base of Cape Mountain. The camera was looking approximately WNW, and on a clear day, both Fairway Rock and the Diomede Islands were visible. The webcam images were updated every 5 minutes. Scientists from UAF came to Wales to perform regular ice coring and ice thickness profiles.

The Federal Aviation Administration operates airport webcams showing daily weather conditions that also show daily sea ice (compared to open water) looking west towards Diomede Islands (FAA WeatherCams).

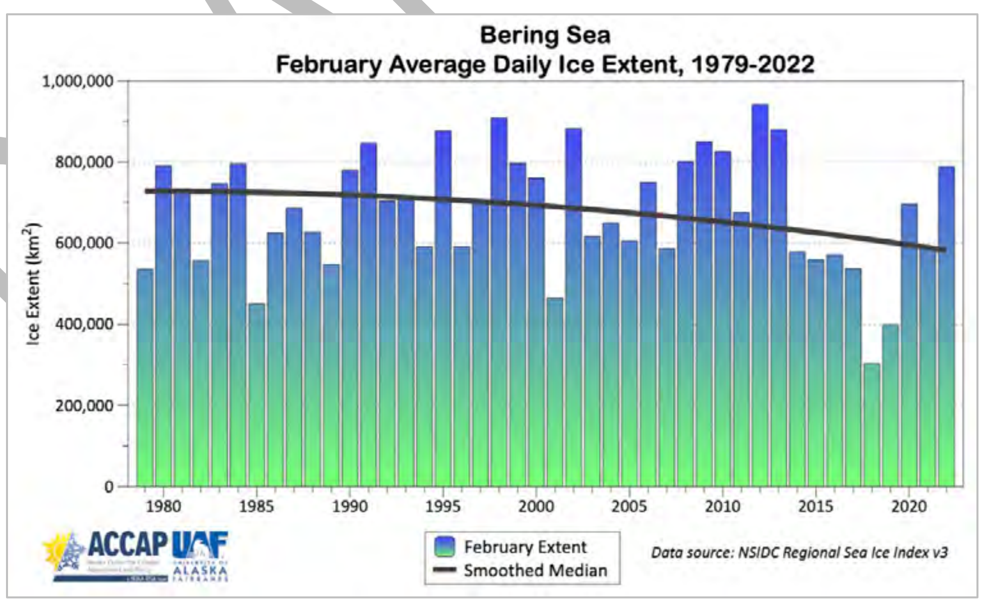


The graphic above shows the maximum ice extent in the Bering Sea during April from 2013-2018. Source: NASA 2019

Figure 41- Bering Sea Ice Extent 2013-2018

Extent (Magnitude/Severity)

Figure 42 shows the average daily sea ice extent in February in the Bering Sea from 1979-2022.



Source: ACCAP 2023

Figure 42- Bering Sea Average February Sea Ice Extent (1979-2022)

Impact

Declining sea ice is impacting subsistence in Alaska. Changing sea ice patterns affect marine mammals and their access to hunters. The loss of sea ice creates dangerous conditions for hunting and limits hunting success for subsistence foods.

Another impact of declining sea ice is the increased presence of polar bears on land. In the winter, polar bears hunt seals that are hauled out on the sea ice. Polar bear presence is closely correlated to sea ice extent. If sea ice melts earlier than it used to, then bears will come to shore sooner than they typically do.

Increased polar bear activity on land threatens the entire population of Wales. Tragically, in 2023, a mother and her son were killed when a polar bear attacked them near the school. There was little to no visibility due to blowing snow and the polar bear was not seen before the attack. The polar bear attempted to enter the school, but school officials quickly shut the doors before it could enter. This was the first polar bear attack in Alaska in 30 years. The community reported a polar bear sighting below the store on the ice on April 18, 2024.

In Wales, school officials perform daily patrols before and after school to ensure no animals are nearby when students are coming to and leaving school. Daily updates are posted in the community Facebook group.

Probability of Future Events

As global temperatures rise, and the extent of sea ice decreases, the probability of sea ice hazards increases. Based on previous occurrences and the criteria identified in Table 7, it is Highly Likely that Wales will experience a sea ice hazard 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 Conditions Including Climate Change

Sea Ice Extent	
Changing Factor	**Description of Changes Due to Climate Change**
Nature	Climate change, over time, could affect the nature and character of sea ice hazards, with a reduction of thick annual sea ice in the near-shore environment. Until that time, while sea ice is still thick enough to use as a transportation surface, there will be increased hazard of shifting and cracking (DHS&EM 2023).
Location	Sea ice hazards are associated near the shoreline, in locations where sea ice forms. Including the Bering and Chukchi Seas.
Extent	The continual loss of sea ice will increase the magnitude/severity of coastal erosion and storm surge during Bering Sea storms.
Impact	Sea ice and climate are intimately linked. There are three timeframes to consider concerning the impacts of sea ice as climate changes (DHS&EM 2023): 1. Long-term concerns: Regulation of the global climate 2. Intermediate-term concerns: Coastal erosion 3. Immediate concerns: Transportation Declining sea ice will also continue to threaten subsistence activities and food sovereignty in the community.

Sea Ice Extent	
Changing Factor	**Description of Changes Due to Climate Change**
Probability of Future Events	The probability of future sea ice hazards will continue to increase as global temperatures rise and the extent of sea ice decreases in the Bering Sea.
Changes in population patterns	Due to the location of sea ice hazards in the Wales planning area, it is possible to impact future population patterns.
Changes in land use development	Due to the location of sea ice hazards in the Wales planning area, it is not likely to impact future land use development.

3.3.4.3 Snow Avalanche

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. A moving avalanche may be preceded by an "air blast," which is also capable of damaging buildings. Snow avalanches commonly occur in the high mountains of Alaska during the winter and spring as the result of heavy snow accumulations on steep slopes.

Large avalanches have the potential to kill people and wildlife, destroy infrastructure, level forests, and bury entire communities. 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, and earthquakes.

An avalanche releases when gravity-induced shear stress on or within the snowpack becomes larger than its shear strength. Triggers can be natural (e.g., rapid weight accumulation during or just after a snowstorm or rain event, warming temperatures, and seismic shaking) or artificial (e.g., human weight or avalanche-control artillery). There are four distinct avalanche types in Alaska that occur under varying snowpack and weather conditions. 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 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, running the gamut 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.

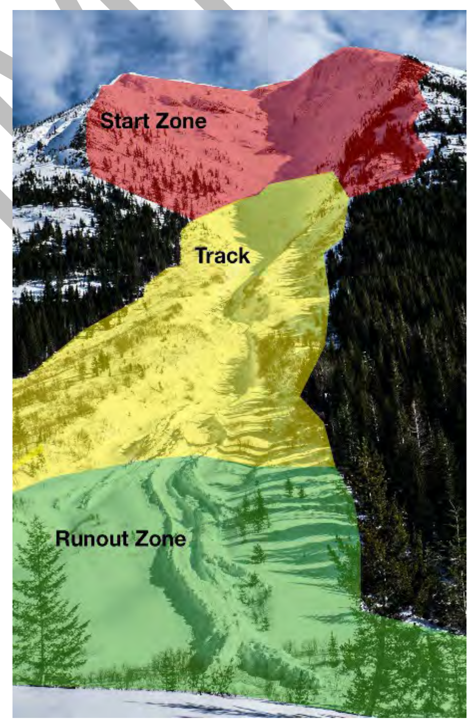
Slush Avalanches are fast-moving mixtures of snow and water. They release in isothermal snowpacks (snow temperature throughout the snowpack is 32°F) when liquid water permeates the snowpack and dramatically weakens the intergranular bond. Slush avalanches, therefore, typically occur in northern Alaska during the spring when warm temperatures and strong solar radiation quickly warm up the snowpack. Slush avalanches can release on slopes as gentle 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.

An avalanche path comprises three main parts: starting zone, track, and run-out zone (Figure 43). Local topography determines the shape and size of each part. Steep gullies that contain a stream or creek in the summer often function as avalanche paths in the winter, but avalanches also release and run on simple and complex open slopes.

The starting zone is also called the release area. This is the upper part of the avalanche path, where snow accumulates (creating a slab or point source release area), and the avalanche begins its downhill movement. Starting zones are commonly located in the headwaters of a drainage where snow is accumulated on lee-side aspects of topographic features. Starting zones on open slopes are more difficult to identify. Sometimes multiple starting zones join into one track (e.g., several creeks funneling into one major gully).

The track is the middle part of the path, where the avalanche transports the released snow downhill to the deposition (runout) zone. The avalanche accelerates and reaches its maximum velocity in the track, and can also pick up more snow, adding to its mass. The track can be comprised of both confined gullies and unconfined open slopes. Tracks can also branch onto adjacent slopes, creating successive avalanches.

The run-out zone is the bottom part of the path, where the avalanche slows down and deposits debris. The avalanche impact pressure, which is a function of its snow density, volume (i.e., mass), and velocity, determines the amount of damage the avalanche could potentially cause. This measure is used for designing mitigation structures to protect infrastructure and buildings that are located in an avalanche risk zone.



Source: Avalanche Canada 2024

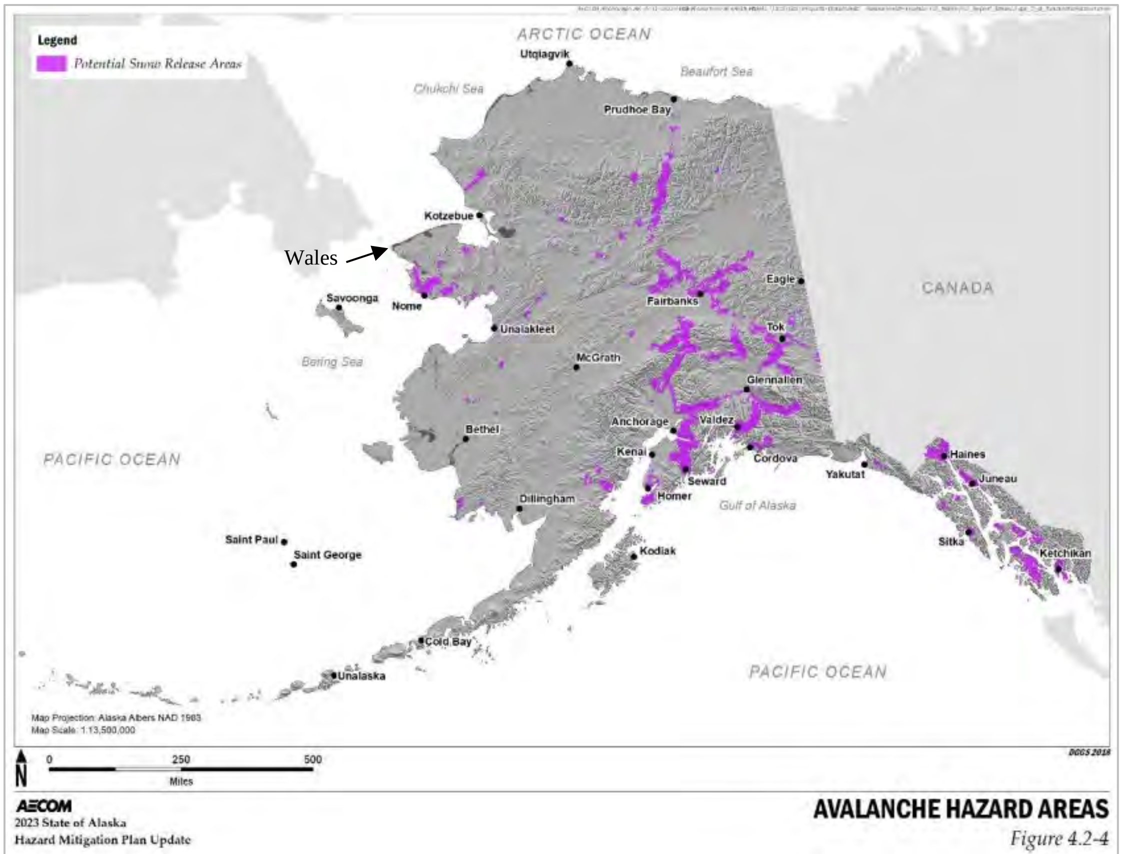
Figure 43- Path of an Avalanche

History

The Planning Team states that during the early 1900s, an avalanche killed a resident in Wales.

Location

The 2023 State of Alaska SHMP identifies statewide avalanche hazard areas (Figure 44). There are avalanche hazard areas in Wales, associated with Cape Mountain and Razorback Mountain, shown in Figure 45 and Figure 46.



Source: DHS&EM 2023

Figure 44- Statewide Avalanche Hazard Areas

Source: CoastView 2024

Figure 45- Location of Cape and Razorback Mountain in Proximity to the Village

Source: Buzard et al. (2021)- Erosion Exposure Assessment- Wales

Figure 46- Location of Cape Mountain in Proximity to the Village

Extent (Magnitude/Severity)

Avalanches can be incredibly destructive and have the potential to destroy everything in its path, and result in human deaths every year. Over the last 10 years (2012-2022), 27 people died in avalanches each winter in the United States (CAIC 2024). The number of people caught or buried in avalanches each year because most non-fatal avalanche incidents are not reported (CAIC 2024).

In Wales, avalanche hazard locations are associated with Cape Mountain, 3 miles SE of the community. There has been 1 fatality in Wales from an avalanche in the early 1900s. Therefore, based on past event history and the criteria identified in Table 6, the extent of avalanches and resultant damages to people and infrastructure in Wales are considered Critical, where injuries and/or illnesses could result in permanent disability, a complete shutdown of critical facilities for at least two weeks, and more than 25% of property is severely damaged.

Impact

Avalanches can be incredibly destructive and have the potential to destroy everything in its path, and result in human deaths every year. Between 2012 and 2022, 27 people died in avalanches each winter in the United States (CAIC 2024). The number of people caught or buried in avalanches each year is unknown because most non-fatal avalanche incidents are not reported (CAIC 2024).

An avalanche killed a resident in the early 1900s, but there have been no recent impacts from snow avalanches in Wales.

Probability of Future Events

As climate warming continues, there is an expectation of an increase in Alaska's vulnerability to snow avalanche hazards (DGGS 2024b).

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. However, as snow cover retreats upwards due to these same factors, the impacted area will also change to higher elevations (Ballesteros-Canovas et al. 2018).

Based on previous occurrences and the criteria identified in Table 7, it is Possible that Wales will experience a snow avalanche 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 Including Climate Change

Snow Avalanche	
Changing Factor	**Description of Changes Due to Climate Change**
Nature	Climate change is not anticipated to influence the nature of snow avalanche hazards in Alaska.
Location	Landslides and snow avalanches are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from thawing permafrost and glacial decline (IPCC 2019).
Extent	Avalanche activity is determined by a number of 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, will lead to greater occurrence of wet snow avalanches, especially in late winter/early spring (Wever et al. 2016; Ballesteros-Canovas et al. 2018).
Impact	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 from climate change, the impacted area will also shift upwards. Impacts in this scenario will likely be due to loss of water supply, affecting agriculture, culture, and tourism (IPCC 2019).
Probability of Future Events	As climate warming continues, there is an expectation of an increase in Alaska's vulnerability to snow avalanche hazards (DGGS 2024). 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. However, as snow cover retreats upwards due to these same factors, the impacted area will also change to higher elevations (Ballesteros-Canovas et al. 2018).
Changes in population patterns	Due to the location of avalanche hazards in the Wales planning area, it is possible to impact future population patterns.
Changes in land use development	Due to the location of avalanche hazards in the Wales planning area, it is likely to impact future land use development.

3.3.5 NATURALLY OCCURRING URANIUM

3.3.5.1 Nature

Uranium (chemical symbol U) is a naturally occurring radioactive element. When refined, uranium is a silvery-white metal. Uranium has three primary naturally occurring isotopes: U-238, U-235, and U-234 (EPA 2024).

Uranium is present naturally in virtually all soil, rock, and water. Rocks break down to form soil, and soil can be moved by water and blown by wind, which moves uranium into streams, lakes, and surface water. More than 99% of the uranium found in the environment is in the form of U-238 (EPA 2024).

A person can be exposed to uranium by inhaling dust in air, or ingesting water and food. The general population is exposed to trace levels of uranium primarily through food and water (EPA 2024). People who live near federal government facilities that made or tested nuclear weapons, or facilities that mine or process uranium ore or enrich uranium for reactor fuel, may have increased exposure to uranium. Uranium that is depleted (U-235) is used in industrial settings (EPA 2024).

The Virginia Department of Health reports that natural occurring uranium produces very little radioactivity and any health effects are due to the chemical properties of uranium. The EPA's maximum permissible contaminant level for uranium in drinking water is 30 micrograms per liter (µg/L).Long-term exposure of high concentrations (100-600 µg/L) can lead to kidney damage. The effects can cause a decrease in the kidney's ability to hold onto proteins, sugar, and other compounds.

3.3.5.2 History

Uranium was first detected in Wales' drinking water between 2008-2010 when routine tests of the main water source used by the school, the clinic and villagers report uranium levels that slightly exceed federal standards (ADN 2010).

The numbers bewildered Department of Environmental Conservation officials, who say excess uranium levels are unheard of in Alaska water supplies (ADN 2010).

Uranium exposure is an ongoing issue for Wales. Wales regularly tests their drinking water for levels of uranium and Norton Sound Health Clinic regularly tests the quality of drinking water in Wales.

3.3.5.3 Location

The uranium in Wales' drinking water is thought to be coming from enriched granite on Cape Mountain, which is also the source of nearby tin placer deposits that were mined from 1902 to 1990 (ADN 2010).

The largest known deposit of uranium in the state is on the eastern Seward Peninsula, north of the village of Elim. A Canadian mining partnership performed exploratory drilling for uranium there from 2005 to 2008 (ADN 2010).

A uranium deposit discovered in 1977 in western Alaska, by means of airborne radiometric data, is the largest known in Alaska on the basis of industry reserve estimates. At about latitude 65 degrees N, it is the most northerly known sandstone-type uranium deposit in the world. The deposit lies in Eocene continental sandstone near the eastern end of the Seward Peninsula, in the southern end of a graben that extends northward into the Death Valley depositional basin (USGS 1987). The most common uranium mineral is meta-autunite, but coffinite has been identified in the primary deposits.

The major radioactive minerals in placer concentrations from the Cape Mountain area in the western Seward Peninsula are monazite, xenotime, and zircon. The concentrates contain as much as 0.9% equivalent uranium and average about 0.03% equivalent uranium which, because of the monazite content of the concentrates, is ascribed mostly to thorium (Bates and Wedow 1963). The source of the radioactive minerals is likely the granite at Cape Mountain, although they may be genetically related to the tin deposits in the area (Bates and Wedow 1963).

Figure 47 shows the Alaska DEC's Drinking Water Protection Area in Wales. The red line is the community's water source, which is in Cape Mountain. As their water travels through the mountain, it is picking up traces of uranium and other minerals. The two wells are indicated by the blue glowing area at the base of the Mountain.

Source: Alaska DEC 2024

Figure 47- Alaska DEC Drinking Water Protection Area (Wales)

3.3.5.4 Extent (Magnitude/Severity)

In 2007, uranium was not detected in Wales' drinking water, but in 2010, the concentration was 32.5 µg/L, just slightly above EPA's maximum permissible contaminant level for uranium in drinking water of 30 µg/L. In Alaska DEC's 2020 Drinking Water Program Annual Compliance Report, Wales' water system is still labeled as being contaminated with "Combined Uranium" (DEC 2020).

More information on source water assessments in Wales can be found at: https://dec.alaska.gov/DWW/JSP/WaterSystemDetail.jsp?tinwsys_is_number=3229&tinwsys_st_code=AK&wsnumber=AK2340191.

In 2024, Kawerak, Inc. received a grant from the American Red Cross to provide reserve osmosis/UV/ heavy metal water filters to each household in the Kawerak region.

Based on past event history, potential impacts, and the criteria identified in Table 6, the extent of uranium exposure and resultant damages to people and infrastructure in Wales is considered Limited where injuries and/or illnesses do not result in permanent disability, critical facilities to be shut down for more than a week, and more than 10% of property or critical infrastructure being severely damaged. Further information is needed to accurately evaluate the extent of exposure to uranium on the residents of Wales.

3.3.5.5 Impact

Uranium decays by alpha particles. External exposure to uranium is therefore not as dangerous as exposure to other radioactive elements because the skin will block the alpha particles. Ingestion of high concentrations of uranium can cause health effects, such as cancer of the bone or liver. Inhaling large concentrations of uranium can cause lung cancer from the exposure to alpha particles (EPA 2024).

Most ingested uranium is eliminated from the body. However, a small amount is absorbed and carried through the bloodstream. Studies show that drinking water with elevated levels of uranium can affect the kidneys over time.

The Planning Team is also concerned about the increase of health-related issues in the younger generations in the Village, which may or may not be related to uranium exposure. Specifically, the Planning Team expressed concern with the increasing number of kids in Wales being diagnosed with autism. One study found elevated uranium in hair and urinary in children with autism compared to normally developing children (Rossignol et al. 2014), but the results are limited due to the small sample size and inconsistencies in study methods.

While prolonged exposure to uranium is a public health concern, impacts to critical facilities and infrastructure are not anticipated.

3.3.5.6 Probability of Future Events

As uranium exposure is an ongoing issue for Wales, it is Highly Likely that there will be uranium exposure 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.

3.3.5.7 Future Conditions Including Climate Change

Climate change is not likely to influence the nature, location, extent, impact, population patterns, land use development, or probability of future uranium hazards in Wales.

3.3.6 FLOOD

3.3.6.1 Nature

Flooding is the accumulation of water in areas that typically do not hold water, or it can result from surplus water from streams, rivers, lakes, reservoirs, glaciers, or coastal water bodies overflowing onto the surrounding floodplains. Floodplains are the adjacent low-lying grounds adjacent to water bodies, formed mainly of sediment deposits from past flooding events.

Wales experiences coastal flooding. There are three primary types of flooding that can occur in Wales: rainfall-runoff, snowmelt, and storm surge.

Rainfall-Runoff Flooding: The most common type of flood, rainfall runoff magnitude is determined by rainfall intensity, duration, distribution, and geomorphic characteristics of the watershed. Weather systems that bring strong persistent rainfall differentiate rainfall runoff from the other categories of flooding. Rainfall runoff flooding is more likely to occur in late summer to early fall.

Snowmelt Floods: Spring weather patterns and snowpack depths determine the immensity of this flooding occurrence. Snowmelt takes place in the spring, usually between the months of April through June.

Storm Surges: Storm surges are a coastal flood that occurs when the sea travels inland past the high-tide level, often accompanied by high winds, increasing the destructive force of the water. Storm surge is a significant cause of property damage in Alaska.

Due to the slow movement of ice over time, ice override does not pose an immediate threat, however it can move through structures, damage road systems, and impede travel. Ice override damage can be limited with the use of bulkheads or other or other structures to break-up the ice.

Conditions that have a high possibility of resulting in flooding in coastal areas include low atmospheric pressure, strong winds (blowing directly onshore or along the shore with the shoreline to the right of the direction of the flow), and consistent winds persisting from a consistent direction over a long distance across the open ocean (fetch).

Communities that are most susceptible to coastal flooding typically have gradually sloping bathymetry near the shore and exposure to strong winds with a long fetch over the water. Communities and villages along the west coast areas of Alaska, particularly the northwest Arctic Coast, have experienced significant damage from coastal floods. These locations will usually experience coastal flooding during the late summer or early fall. There is a decreased potential for ground failure as shore-fast ice (ice that is “fastened” to the coastline) forms along the coast before winter, but later freeze-ups and earlier fall/winter storms increase the potential of erosion, storm surge flooding and ice override events.

3.3.6.2 History

As a coastal community, Wales experiences seasonal Bering Sea coastal flooding.

The top 10 storm surge events from 1954-2004 are listed below, in order of maximum surge level.

Table 15- Top 10 Storm Surge Events in Wales from 1954-2004

Rank	Starting Date	Maximum Surge (ft MLLW)	Minimum Surface Pressure (mb)	Maximum Wind	
				Speed (mph)	Direction
1	11/10/74	5.37	957.7	54.1	S
2	11/12/96	5.33	998.1	46.5	SE
3	11/06/85	5.00	984.1	38.7	E
4	10/15/04	4.97	964.6	48.3	E
5	10/25/96	4.87	991.6	47.2	SSW
6	11/08/78	4.71	988.0	55.3	SSE
7	11/16/90	4.58	986.3	40.3	E
8	11/14/66	4.41	985.1	56.6	SSE
9	10/02/92	4.28	969.4	41.4	SE
10	11/19/04	3.82	979.2	37.6	E

Source: Chapman et al. (2009)

The USACE completed an erosion assessment for Wales during their 2009 Alaska Baseline Erosion Assessment. The Erosion Information Paper dated October 15, 2007, states:

> *Major floods in the area occurred in 1933 and 1969, although no water was reported to have entered the community. A 1974 storm caused minimal damage. A 1984 report prepared by the State of Alaska Department of Transportation and Public Facilities noted no significant erosion problems.* (USACE 2007)

The National Weather Service's Storm Events Database provides details of historic flood events (January 1996 – November 2023) and their impacts to Wales (Table 16). The NWS Storm Events Database has data dating back to January 1950 for many states, but it began collecting data for Alaska in January 1996.

Table 16- Historic Flood Events in Wales

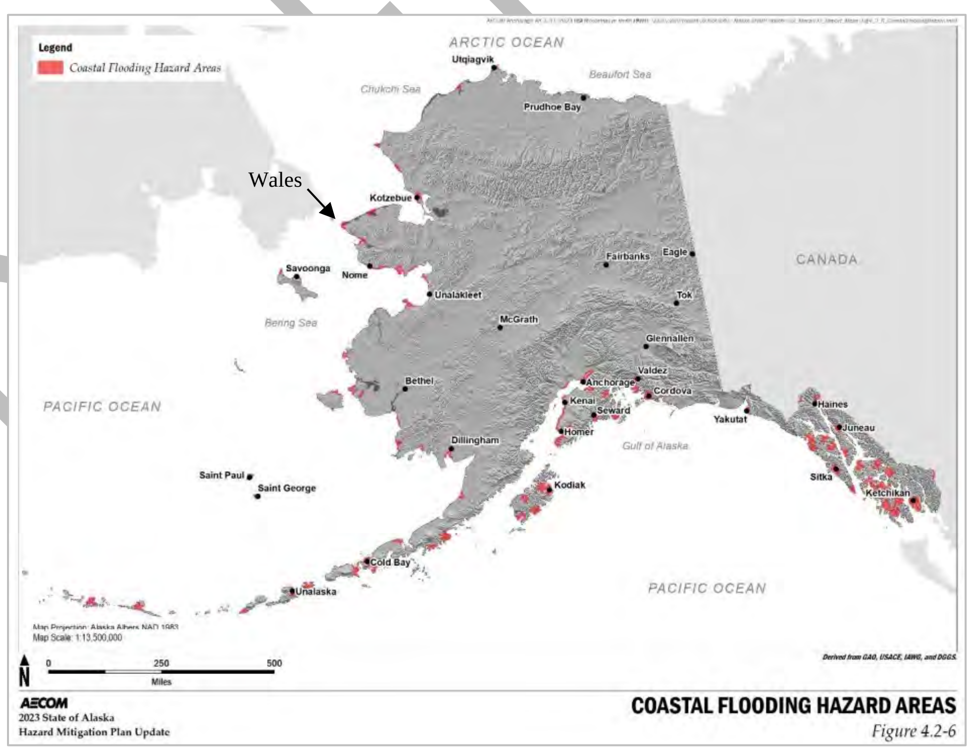
Date	Event Type	Description/Magnitude of Event
11/14/1966	Storm Surge	Maximum surge: 4.41 ft MLLW
11/10/1974	Storm Surge	Maximum surge: 5.37 ft MLLW
11/08/1978	Storm Surge	Maximum surge: 4.71 ft MLLW
11/06/1985	Storm Surge	Maximum surge: 5.00 ft MLLW
11/16/1990	Storm Surge	Maximum surge: 4.58 ft MLLW
10/02/1992	Storm Surge	Maximum surge: 4.28 ft MLLW
10/25/1996	Storm Surge	Maximum surge: 4.87 ft MLLW
11/12/1996	Storm Surge	Maximum surge: 5.33 ft MLLW
10/15/2004	Storm Surge	Maximum surge: 4.97 ft MLLW
10/18/2004	Storm Surge/ Tide	A low-pressure center of 978 mb moved north over the central Aleutians on the evening of the 17th and deepened to 941 mb as it reached the Gulf of Anadyr the evening of the 18th, about 400 miles west of Nome. The great deepening of the storm was due to in influx of moisture from an ex-typhoon east of Japan (though the ex-typhoon itself continued east across the north Pacific) and then the cold air around an upper-level circulation of Far East Russia moving southeast into the low. On the 19th the storm began to slowly fill and decelerate, to 980 mb on the evening of the 20th 400 miles west of Kotzebue. The circulation around this storm covered western Alaska with 50 to 80 mph winds and was comparable or stronger than the November 1974 storm, though this current storm moved quicker over the Bering Sea and was located farther west than the 1974 storm. Nonetheless, a significant and damaging storm surge accompanied this storm in addition to high winds. In Wales, surge height estimated at 6 to 8 feet. Damages in Wales: wind blew off a portion of a roof from an Alaska Village Electric Corporation (AVEC) facility, as well as from a private residence. A guardrail from another home was also lost. At the village clinic, the fuel line was ruptured when the metal support for the fuel line running from the tank to the building toppled over in the wind. This spilled about 300 gallons of fuel. One of the two wind generators of the village was damaged. Ocean water rose about 6 to 8 feet, and reached an outbuilding of the school, damaging the skirting along the bottom of the structure, but the structure otherwise was intact. Gravel and insulation over the school's septic tank and leach field damaged and removed by wave and wind action. Two snowmachines belonging to the school were damaged from the combined effects of water and wind-blown sand. Total School damages $8.4K. At the Water plant sewage leach field gravel and insulation was eroded away and septic tank possibly affected. At the Community Center sewage leach field, gravel and insulation was eroded away. Septic tank possibly affected. Road damage at the south end of the village. There was soil erosion due to wind at the cemetery; Caskets are exposed. Wind damage to fence around the dump site by the airport. This event resulted in over $20M in damages in the region.
11/19/2004	Storm Surge	Maximum surge: 3.82 ft MLLW

Date	Event Type	Description/Magnitude of Event
11/09/2011	Coastal Flood	A 960 mb low over the southern Aleutians at 0300AKST on the 8th intensified to 945 mb near the Gulf of Anadyr by 2100AKST on the 8th. The low crossed the Chukotsk Peninsula as a 956 mb low at 0900AKST on the 9th, and moved into the southern Chukchi Sea as a 958 mb low by 2100AKST on the 9th. The low then tracked to the northwest and weakened to 975 mb about 150 miles north of Wrangel Island by 1500AKST on the 10th. The storm was one of the strongest storms to impact the west coast of Alaska since November 1974. At Wales, minor coastal flooding was observed during the afternoon and evening of the 9th by the school and old naval station. The water entered the creek and flooded the lagoon on the back side of the village. The water levels likely peaked during the late evening hours of the 9th. This event resulted in over $24M in damages in the region.
10/11/2017	Coastal Flood	Strong winds developed out ahead of an approaching 958 mb low pressure center along the west coast of Alaska on October 11. The strong winds continued into the 13th. Minor beach erosion also occurred along the coast. Low level areas of Wales saw elevated seas of 3 to 5 feet above normal tides. Wales AWOS reported 60 mph (52 kt).
09/17/2022	Coastal Flood	The extratropical remnants of Typhoon Merbok moved north through the Bering Sea from Thursday September 15th to Saturday September 17th. Strong south to southwest winds resulted in a significant storm surge that caused water levels to rise from 8 to 13 feet above the normal high tide line, with the highest water levels observed at Golovin. This resulted in major coastal flooding and the worst flooding in nearly 50 years. Fish camps and other structures along the coast used for hunting and gathering activities were damaged or destroyed across the region. A state disaster declaration was declared for this event.

Source: NWS 2024- Storm Events Database and Storm Prediction Center Product, Chapman et al. (2004)

3.3.6.3 Location

The 2023 State of Alaska SHMP identifies coastal flooding hazard areas across the state (Figure 48). Wales is located in an identified coastal flooding hazard area, but not in a riverine flooding hazard area.



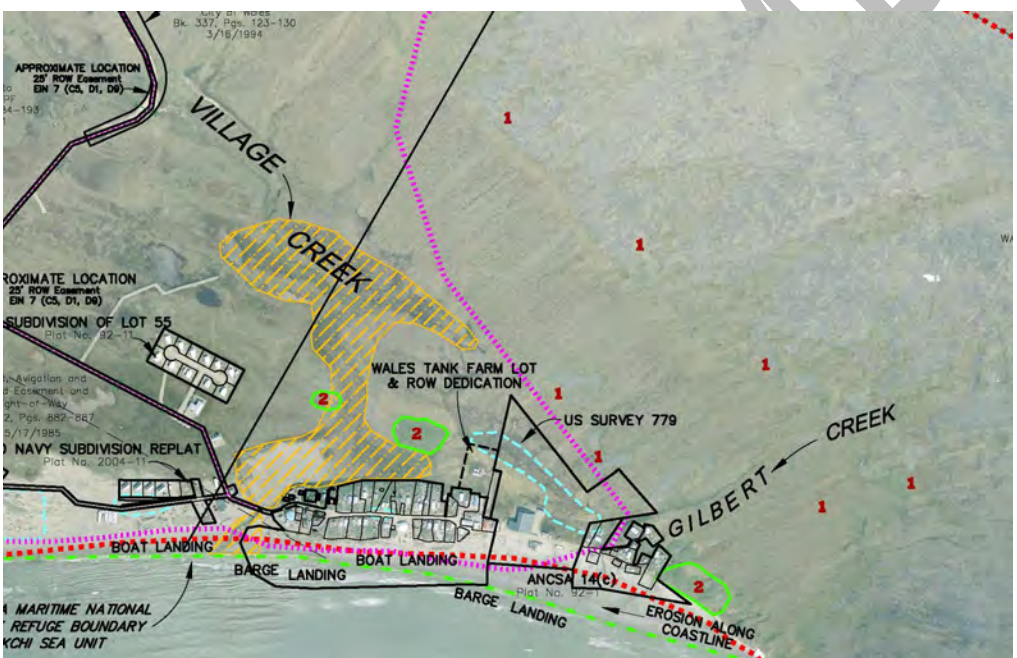
Source: DHS&EM 2023

Figure 48- Statewide Coastal Flooding Hazard Areas

Wales is located on the westernmost point of the American mainland, Cape Prince of Wales, on the western tip of the Seward Peninsula. The community is at the northern end of the Continental Divide where the Bering Sea and Chukchi Sea meet. Typical flood locations in Wales include storm surge along the beach in front of the community.

Wales was spared from significant damages from Typhoon Merbok as the storm came thorough the Bering Strait due to the location of the community behind the Cape Prince of Wales. This Cape protected the community from large storm surges and resulting erosion that impacted many communities in Western Alaska.

The DCRA's 2004 Wales Area Map (Figure 49) shows the location and extent of periodic flooding of Village Creek (in yellow). Figure 50 shows the water level of Village Creek in 1909. In 1909, it was more of a river, but today, this creek is very shallow and more like a traditional creek. The Planning Team is unsure of why the water level has drastically changed.



Source: DCRA 2004

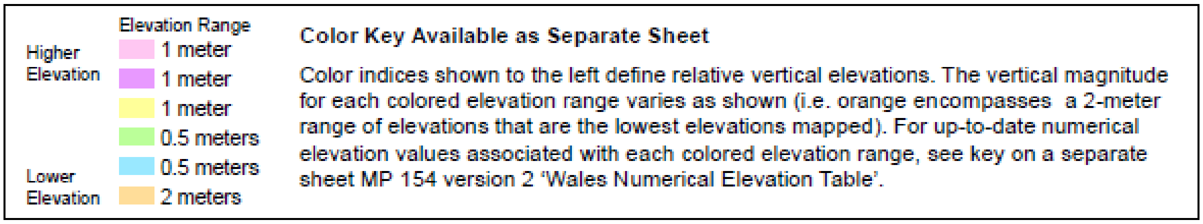
Figure 49- Location and Extent of Flooding at Village Creek

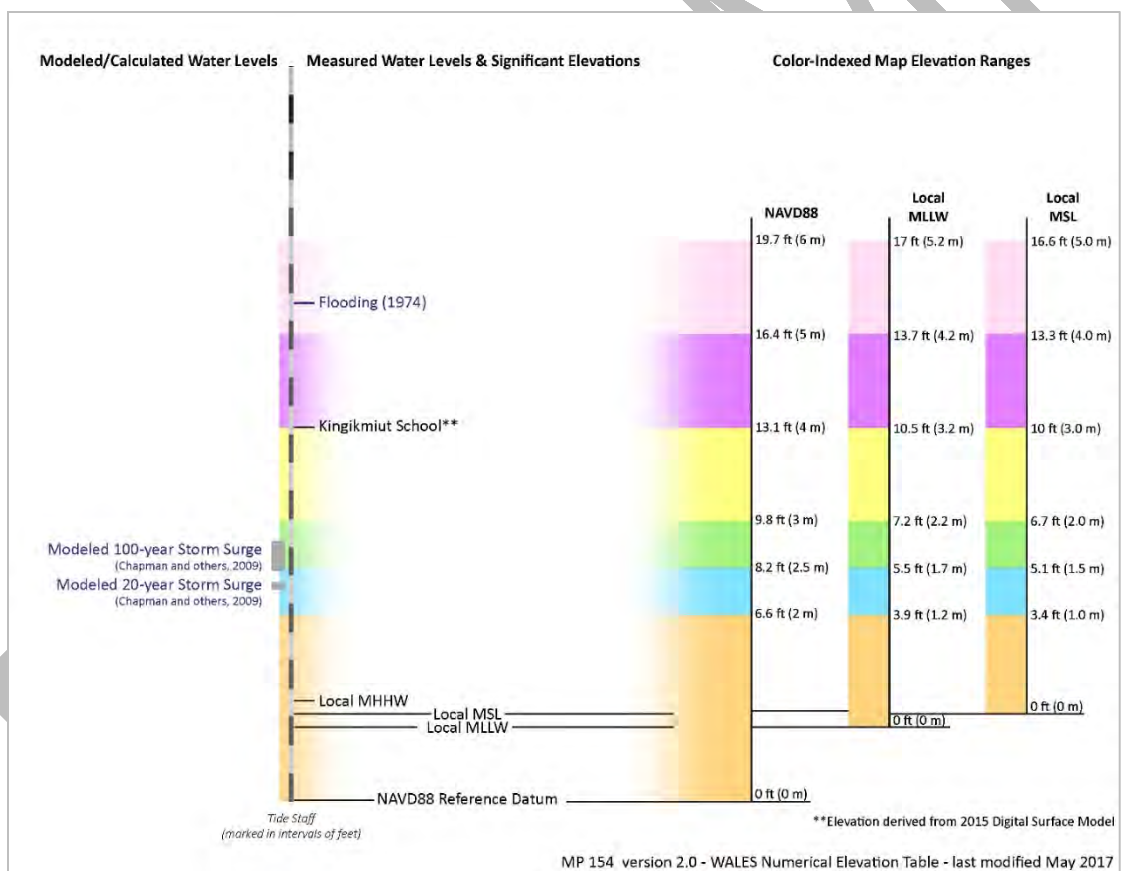
Source: Native Village of Wales

Figure 50- Historical Water Level of Village Creek (1909)

In 2014 and 2017, DGGS released a series of color-indexed elevation maps for flood-vulnerable coastal communities in Western Alaska. These maps were not designed to function as flood inundation maps, but to serve as a temporary tool to communicate about elevations in at-risk coastal communities until true inundation mapping can be completed (Overbeck et al. 2017). The map for Wales was released in 2017, and is shown below.

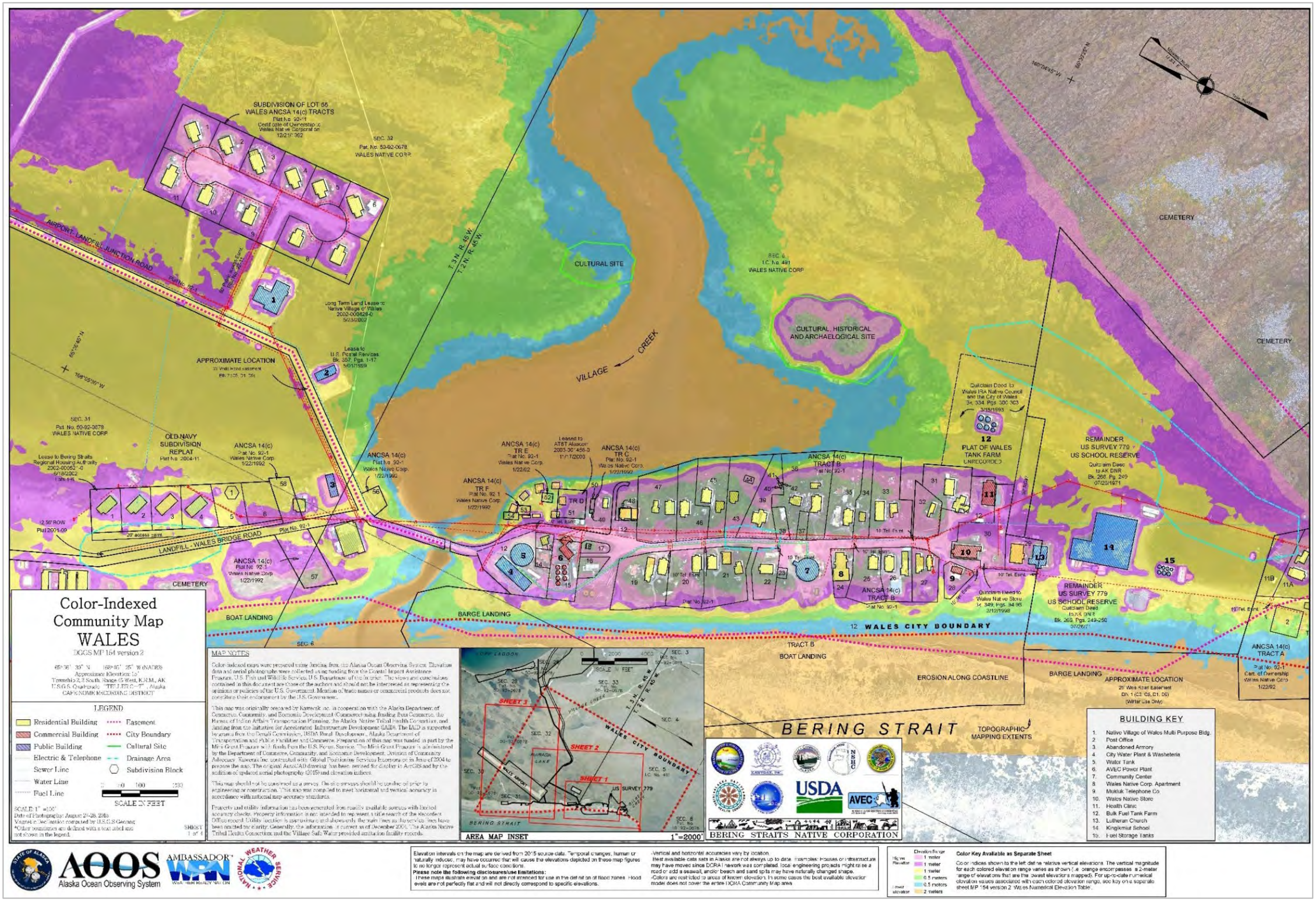
Areas in orange, blue, and green are below the modeled 1% (100-year) storm surge event, which are susceptible to flooding.





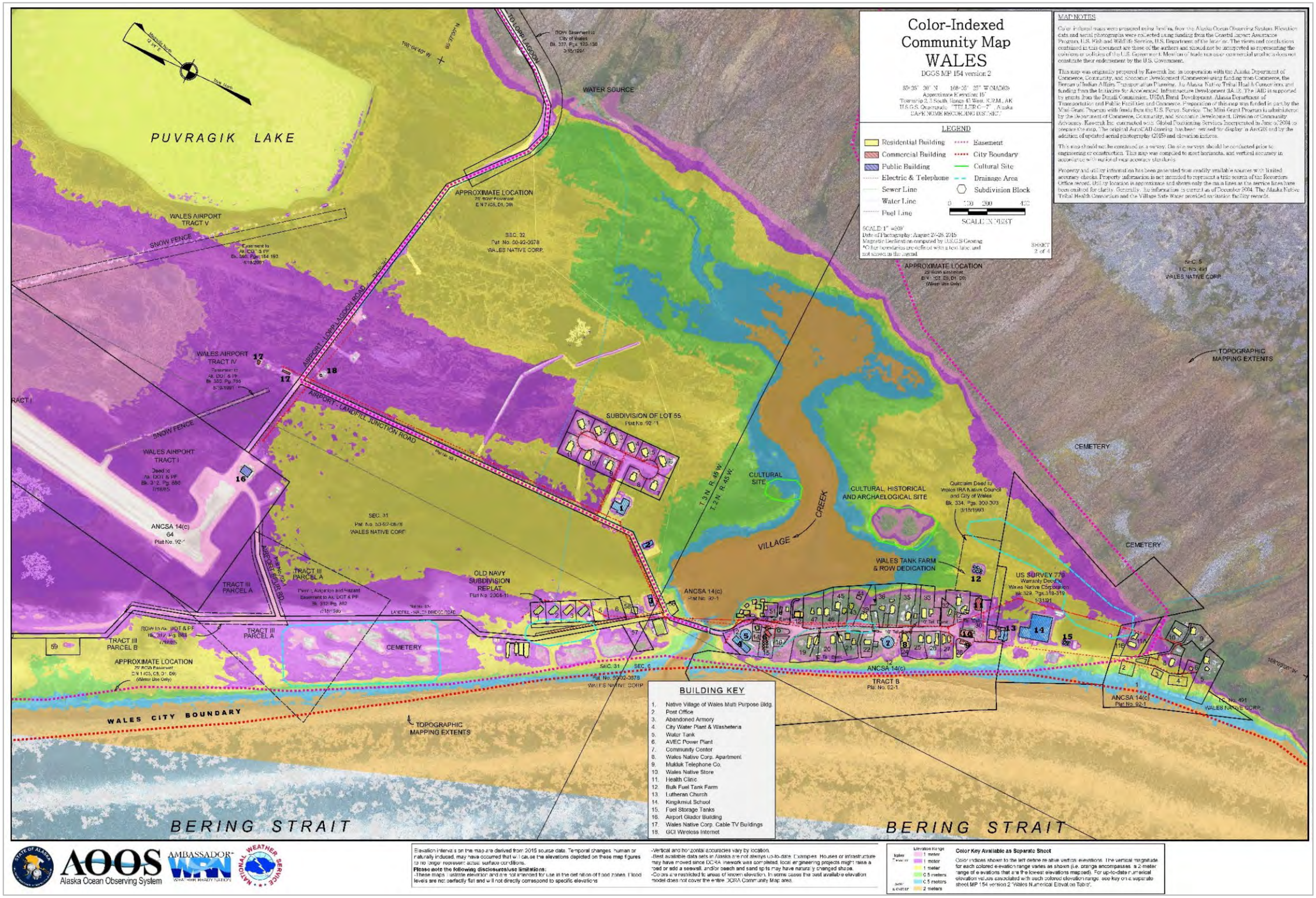
Source: Overbeck et al. (2017)

Figure 51- Wales Color-Indexed Elevation Ranges



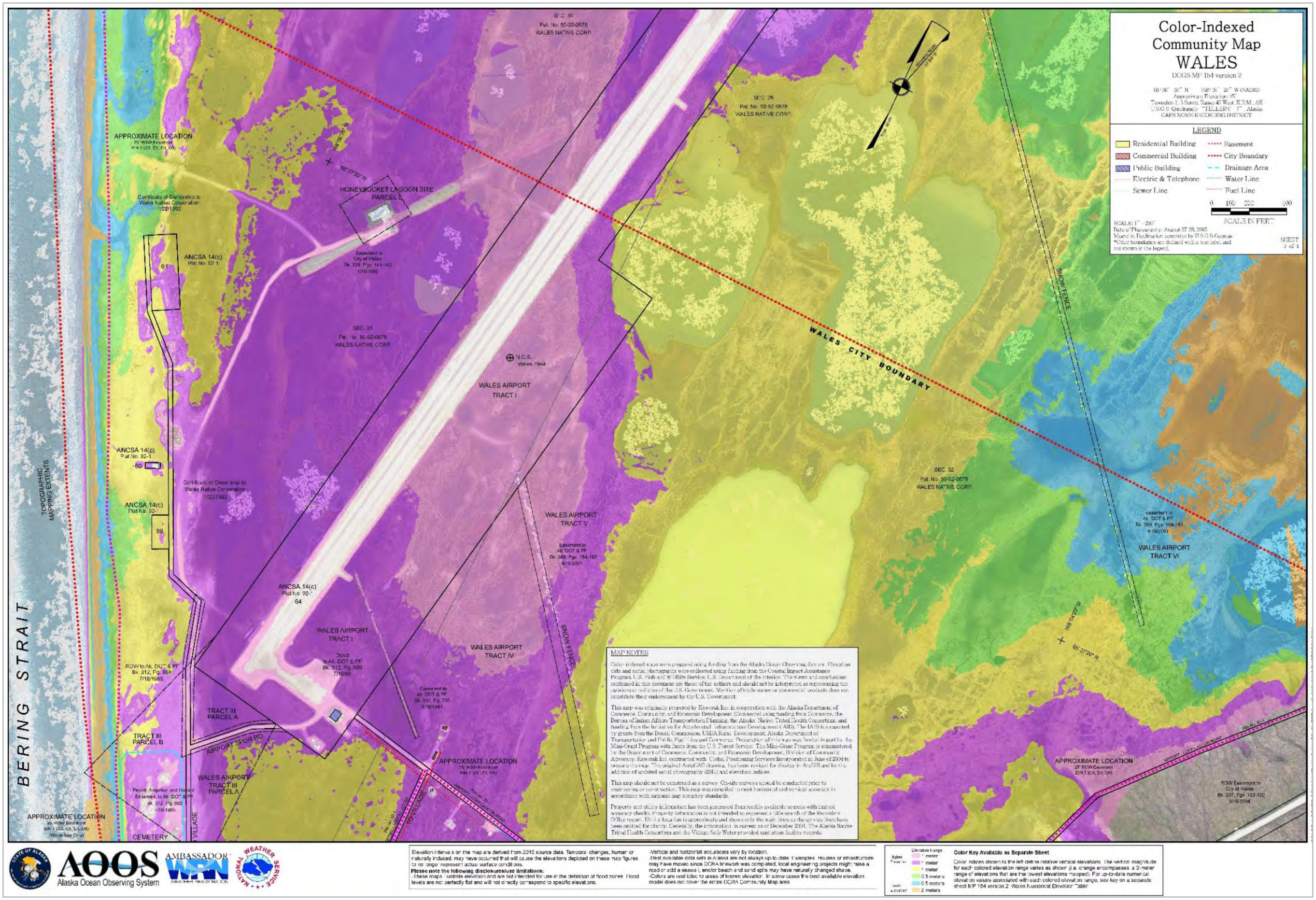
Source: Overbeck et al. (2017)

Figure 52- Wales Color-Indexed Elevation Map (1 of 4)



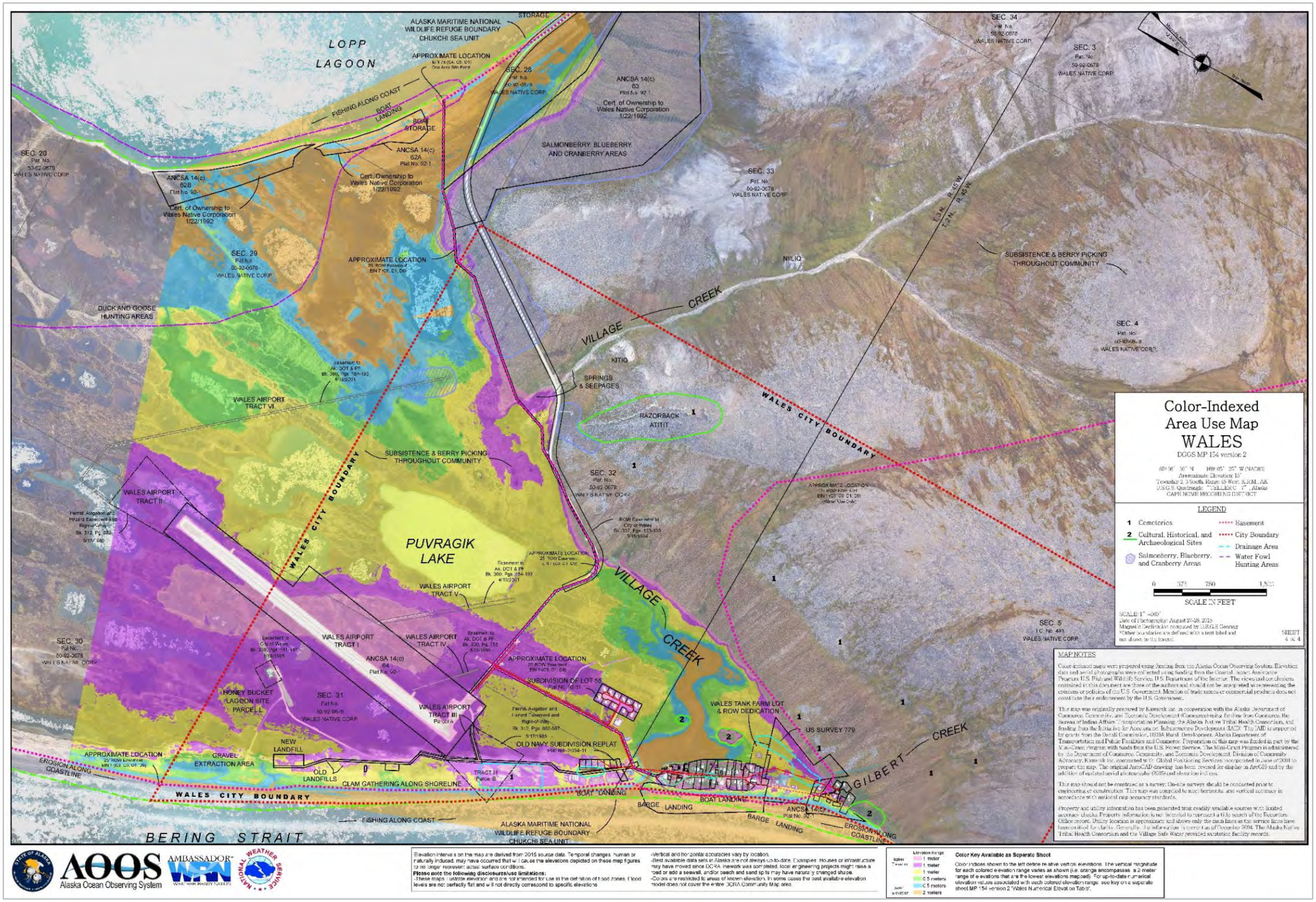
Source: Overbeck et al. (2017)

Figure 53- Wales Color-Indexed Elevation Map (2 of 4)



Source: Overbeck et al. (2017)

Figure 54- Wales Color-Indexed Elevation Map (3 of 4)



Source: Overbeck et al. (2017)

Figure 55- Wales Color-Indexed Elevation Map (4 of 4)

3.3.6.4 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 recurrence.

The following factors contribute to coastal flooding frequency and severity:

- Time of year
- Atmospheric pressure
- Wind speed/strength
- Wind direction

The 2017 USACE Floodplain Manager's Report (USACE 2017) states:

- 1974 flood level: 14.0 MSL
- Recommended building elevation: 16.0 MSL
- The November 1974 flood level approximates the 100-year (1% chance) return interval storm

Harlan Legare, USACE, reviewed 1990 Howard Gray & Associates Wales Flood Hazard Area floodplain analysis and found:

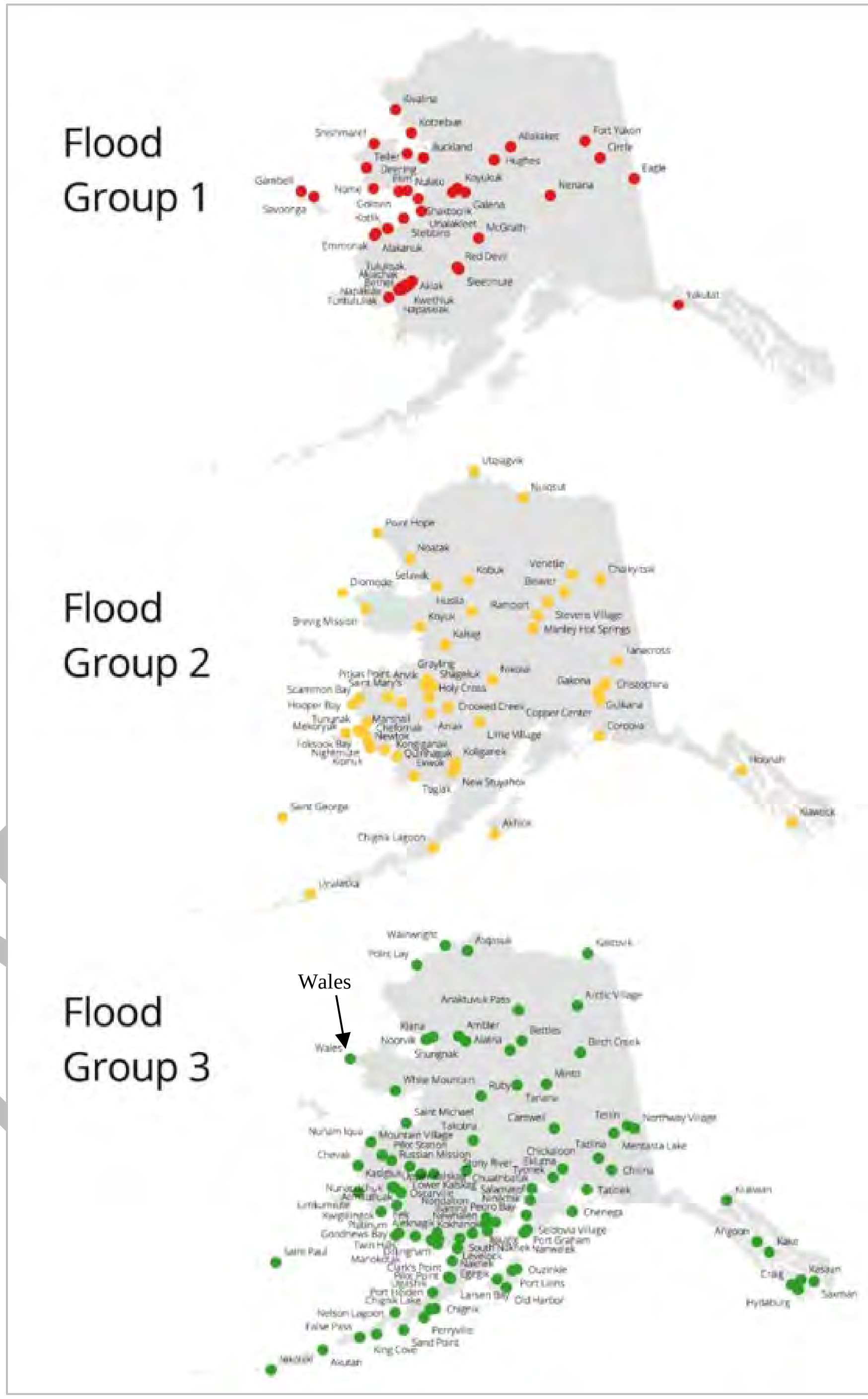
"Howard Grey & Associates, memorandum of November 28, 1990, and concur that the 100-year flood plain elevation for the city of Wales is approximately at the 14-foot level. This is based strongly on the November 1974 storm. Climatological records show that this 3-day storm had sufficient time to produce significant storm surge and that it approximates a 100-year return interval event. New construction should be elevated 2 feet above the base flood elevation, if possible, because of the uncertainty of flood heights. The fill used to elevate the structures should be protected from erosion, not only from possible flood flows, but also from daily foot traffic. A Corps of Engineers permit is needed if fill is to be placed in wetlands" (USACE 1992)

Figure 56 shows the extent of storm surge and resulting erosion in Wales on November 9, 2011.

Photo Credit: Ellen Richard

Figure 56- Storm Surge in Wales (November 9, 2011)

The Denali Commission 2019 Statewide Threat Assessment provides statewide risk ratings for flooding (Figure 57). Wales is located in Group 3, which are the communities that are least threatened by flooding. Group 3 indicated that there is no information available that indicates a threat to critical infrastructure or to the viability of a community, or there is low likelihood that a threat will detrimentally impact the community in the near term. If communities in Group 3 experience threats, they should notify officials and collect data to support understanding the impacts. The time to damage is predicted to be long for all communities in Group 3.



Source: Denali Commission 2019

Figure 57- Statewide Flooding Threat Risk Map

Based on past event history and the criteria identified in Table 6, the extent of flooding and resultant damages to people and infrastructure in Wales is considered Critical where injuries and/or illnesses could result in permanent disability, a complete shutdown of critical facilities may last for at least two weeks, and more than 25% of property would be severely damaged.

3.3.6.5 Impact

Floods may disrupt the normal function of a community by placing excessive pressure on emergency response and can bring a heavy economic burden to communities through the closure of vital infrastructure, communications, utilities, and transportation services. Additionally, floods can negatively impact subsistence activities, such as berry harvesting locations, that the community relies upon when these locations remain flooded for extended periods of time, topsoil layers become eroded, or locations become inundated with debris. This further threatens food sovereignty in the communities.

Flooding causes more deaths than any other natural hazard nationwide. Damage to infrastructure from floods may include the following:

- Floodwaters overtaking structures, causing water damage to structural elements and contents
- High-velocity flooding carrying debris and causing damage to structures, roads, bridges, culverts, and other features. Debris accumulation may create blockage to water movement and cause feature overtopping or backwater damages
- Flooding can inundate wastewater treatment plants of sewage lagoons causing the release of sewage, hazardous or toxic materials release. Storage tanks may be damaged, and pipelines severed all of which could be catastrophic to rural remote communities

Historic flood events in Wales have caused damages to roofs from high wind, ruptured fuel lines and fuel spills, damaged foundations/skirting of the school, damaged two school-owned snow machines, damaged roads, and exposed remains at the cemetery.

An excerpt from an article published in the Nome Nugget newspaper, Stanley Oxereok, the treasurer of the Native Village of Wales, provided details regarding the storm's impact in Wales:

> *"Stanley Oxereok went door to door doing damage assessments after the storm. "Everybody is OK. We had a little bit of damage, siding on a couple of houses, but nobody was hurt," he said. There was minor flooding and debris on the beach, and wind damage to a couple of houses. "That's pretty much it," he said."*

During Typhoon Merbok, the Planning Team states that in Wales, subsistence camps were damaged, the road/trails to subsistence areas were washed out, the creek became full of water but did not overflow, and debris was deposited on their beach.

Other flood events have caused waves to go half way up the school ramp.

3.3.6.6 Probability of Future Events

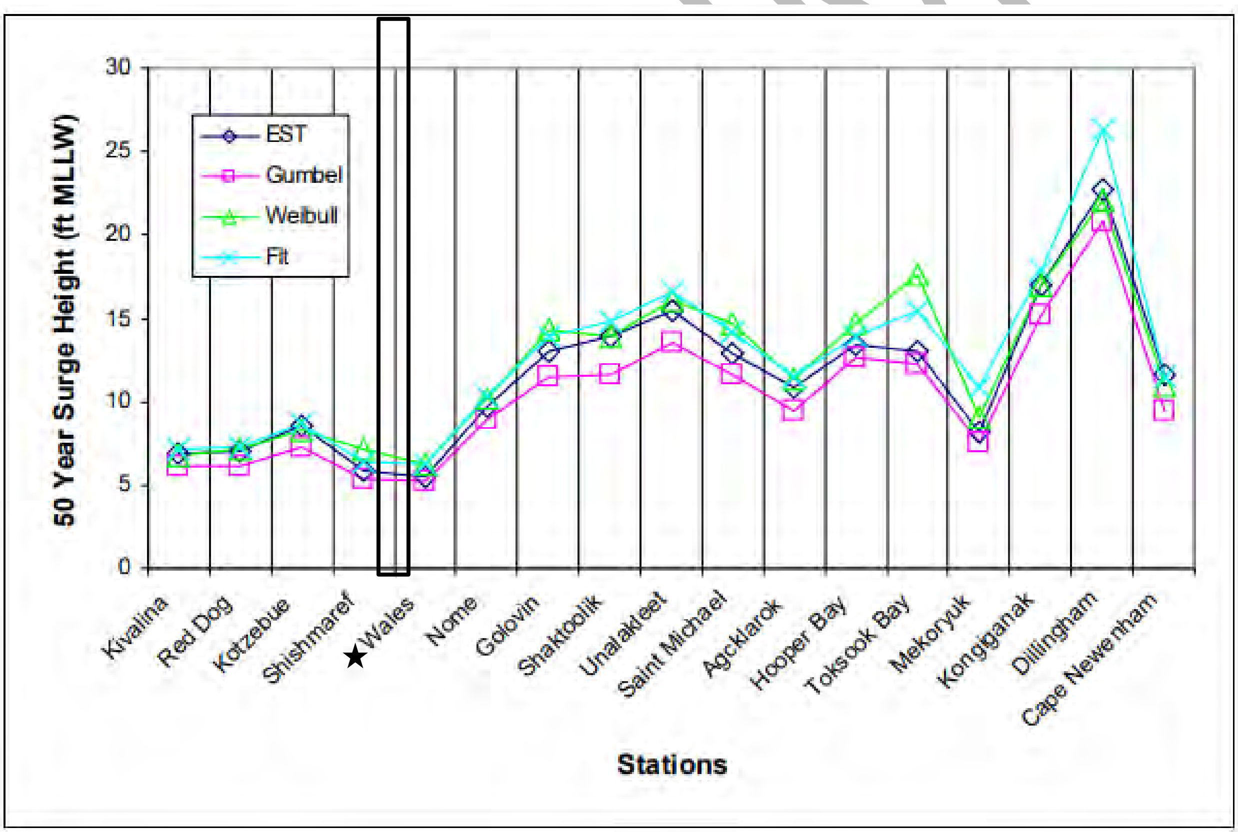
Flooding events are predictable based on seasonal Bering Sea storm patterns. Most of the annual precipitation occurs from April to October resulting in early/late summer and/or fall flooding. Ice melt occurs in the spring which may cause flooding due to runoff. These seasonal occurrences are based on rainfall and seasonal thaw patterns.

Chapman et. al (2009) ran four different models to estimate storm surge levels for different flood intervals in Wales- the results are below (Table 17 and Figure 58). Surge height is estimated in ft MLLW.

Table 17- Estimated Surge Level Based on Flood Frequency

	Return Interval						
Model	5 years	10 years	15 years	20 years	25 years	50 years	100 years
EST	3.63	4.48	4.84	5.04	5.14	5.53	5.96
Gumbel Distribution	4.15	4.61	--	--	5.04	5.27	5.46
Weibull Distribution	4.02	4.78	--	--	5.66	6.25	6.81
Log-Linear Fit	4.05	4.74	--	--	5.63	6.32	7.01
Average	**3.96 ft**	**4.65 ft**	**4.84 ft**	**5.04 ft**	**5.37 ft**	**5.84 ft**	**6.31 ft**

Note: The EST model assumes that future events will be statistically similar in magnitude and frequency to past events.
Source: Chapman et al. (2009)



Source: Chapman et al. (2009)

Figure 58- Estimated 50-year Surge Level in Wales

Based on previous occurrences and the criteria identified in Table 7, it is Likely that Wales will experience a flood 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.

3.3.6.7 Future Conditions Including Climate Change

Due to climate change, the nature or location of flooding events in Wales are not anticipated to change.

Changing Factor	Description of Future Changes due to Climate Change
Extent (Magnitude/ Severity)	Due to climate change, the extent of flooding events is expected to increase. Flooding and erosion of coastal and river areas affect over 87% of the Alaska Native communities (USGCRP 2018). A study by Melvin et al. (2016) projects that increases in floods will result in the largest climate-change related damages in Alaska. 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). Similarly, the loss or retreat of shore-fast sea ice will expose coastlines to greater flood and erosion threat during seasonal coastal storms (USGCRP 2018). This will lead to intensified flooding events throughout the state.
Impact	As the extent of flooding is projected to increase, this will lead to a greater impact by flooding on Alaska's coastal communities, including damage to critical roadways and infrastructure, damage to homes and critical facilities, and increased loss of life. Throughout the end of the 21st century, coastal communities are projected to experience serious changes in tidal amplitudes and increased annual local sea levels, which were once 100-year events (IPCC 2019).
Probability of Future Events	Current research projects that climate change is impacting the return period and intensity of precipitation-based flooding events in arctic regions (Bachand and Walsh 2022). With increased precipitation, in addition to early ice melt and later freezing, and more severe coastal storm events, many locations in Alaska will feel the impacts of climate change. Coastal regions typically protected from storms by sea ice may begin experiencing flooding from these events. Increased precipitation throughout the state of Alaska, with higher changes north of the Brooks Range, will lead to increases in rainfall-runoff flood events as well as other flood related hazards (Lader et al. 2020).
Changes in population patterns	Due to the location of flood hazards in the Wales planning area, it is possible to impact future population patterns.
Changes in land use development	Due to the location of flood hazards in the Wales planning area, it is likely to impact future land use development.

3.3.7 TSUNAMI

3.3.7.1 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 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.

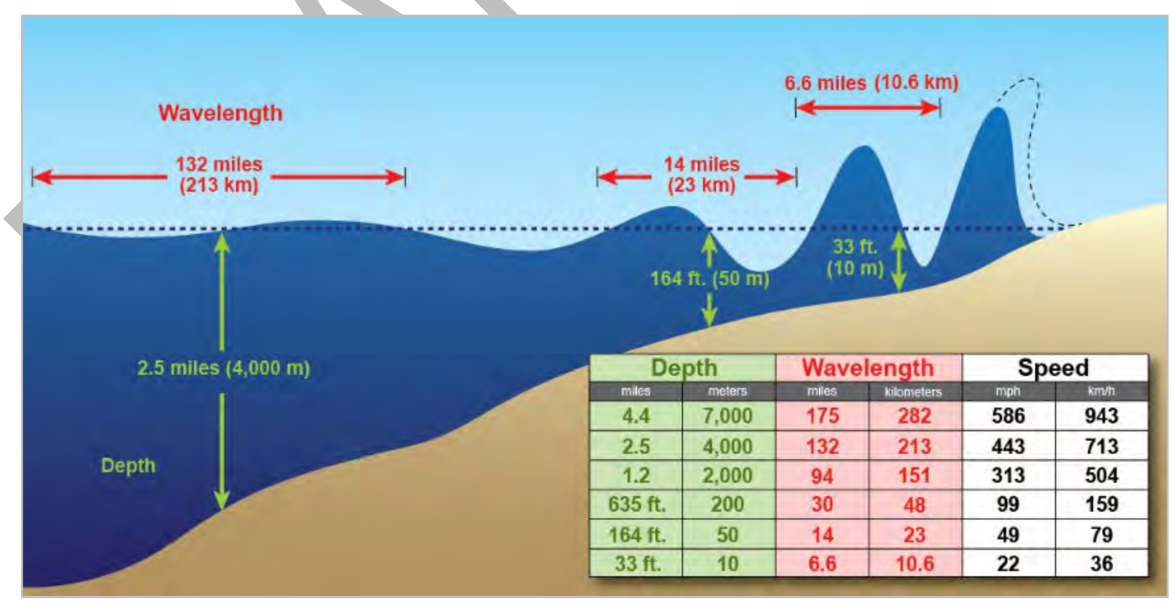
- **Seismically generated tsunamis** are generated by an earthquake event. Seismically-generated tsunamis in Alaska most commonly occur along the subduction zone in the Aleutian Islands. Earthquakes have also generated tsunamis in the back arc area in the Bering Sea and the eastern boundary of the Aleutian Arc plate. Seismically-generated tsunamis typically reach land 20 to 45 minutes after starting. 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 are particularly dangerous because they are able to form the largest tsunami events as they possess the largest amount of kinetic energy, and they do not typically provide any warning before generating.
- **Volcanic generated tsunamis** are the least common type of tsunamis in Alaska, as only one volcanic eruption event 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 heard 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.

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 59). Once the tsunami makes landfall, its speeds slow down to 20-30 mph.



Source: NOAA 2023b

Figure 59- Cross Section of a Tsunami Propagation

3.3.7.2 History

Worldwide seismic activity and tsunamis have only begun being record in the early 1900s. There is a lack of record for historical tsunamis, including Alaska.

Paleotsunami studies conducted in this region demonstrate that significant tsunamis have occurred in this region in the past, and, therefore, can occur in the future (Medvedeva et al. 2023). A history of tsunamis along the Bering coast of the Kamchatka region over the past 4000 years indicates that the northern Kuril-Kamchatka Subduction Zone produces tsunamigenic earthquakes every few centuries (Medvedeva et al. 2023). Analyzing the 4500-year paleoseismic record, 12–15 tsunamis have been documented in the southwestern part of the Bering Sea (Medvedeva et al. 2023).

There has not been a recent tsunami observed in Wales, but members of the Planning Team recall that when they were young, they prepared for a tsunami following an earthquake and went to higher ground, but no tsunami came.

Table 18 describes historical tsunami/tidal wave events that were reported in the Nome area.

Table 18- Historical Tsunamis Reported in the Nome Area

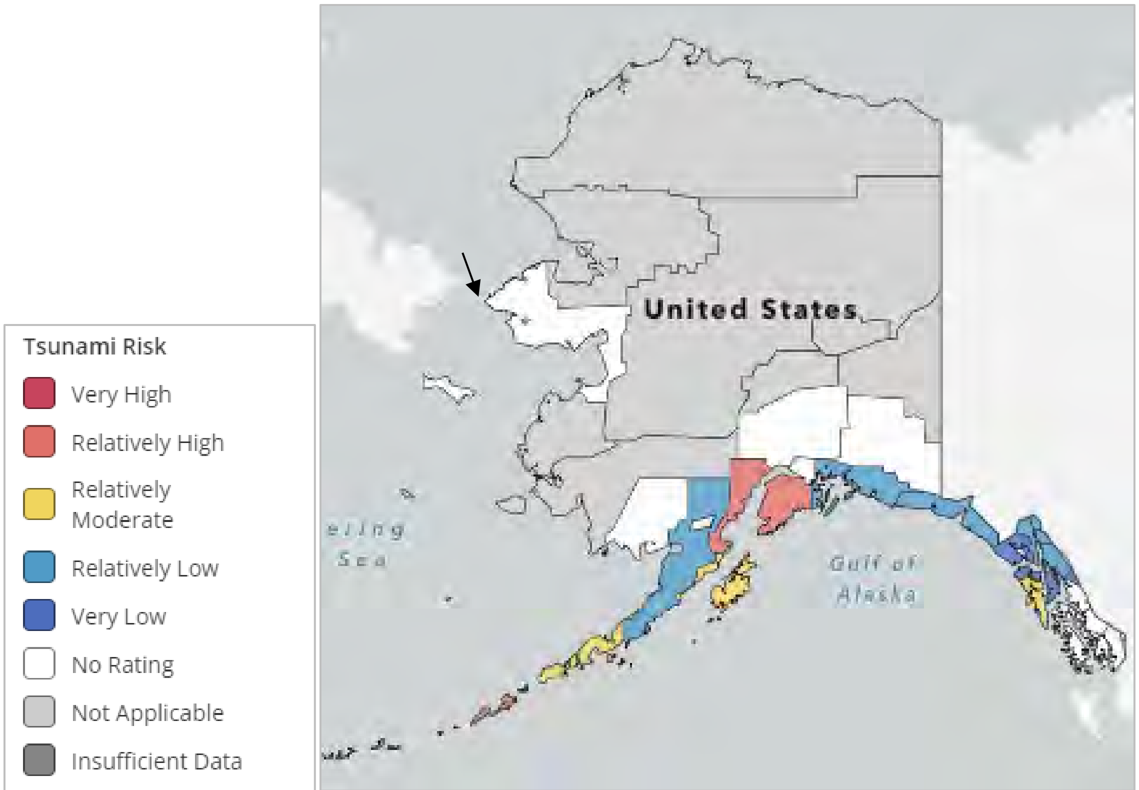
Date	Location of Effects	Distance From Source	Max. Water Height	Comments
11/5/1910	Nome, Solomon	36 miles	Unknown	Floods Extraordinary--Tidal Wave in Alaska--Settlement Wiped Out November 5, 1910. The flooding of Nome, in Alaska, has been of a most extraordinary character. Solomon, a small settlement east of Nome, has been completely wiped out by terrible surf, which was accompanied by neither wind nor rain. The flooding of Nome is inexplicable. It is now announced that no storm occurred there, but that the flooding followed on a rush of the tide. It is probable that a volcanic disturbance took place in the seabed miles distant from Nome, and thus the abnormal tide was formed. In the rush of the tide schooners were driven ashore. If icebergs had been as far southward as usual, they would have dashed against the buildings of the streets on the waterfront. (reference #7596) Much Property Destroyed and Many Lives Lost Nome, Alaska, November 5. A violent submarine earthquake or volcanic eruption is thought to be the cause of a great tidal wave which swept the Nome coast, flooding that city and causing heavy damage to shipping. Although there was no loss of life, 90 residents of the lowlands along the beach saw all their belongings swept away, and barely escaped with their lives. Great waves swept away the frail structures along the beach and carried many small coasting vessels far up on the beach. The flood came without warning. There was complete calm at the time, but the waves were of a giant size, as though raised by a hurricane. No reports of earthquakes have been received, but for several months Mount Bogosloff and Mount Shishalden, near Unimak Pass, have been spouting fire and lava at short intervals, and the Bogosdloff lands have been undergoing peculiar contortions. Reports are anxiously awaited from other points along the coast. (reference #7595) Traditional Knowledge from Ellen Balto Stenberg. Excerpt from Story #11 (1998) I was born in Nome Alaska December 29th, 1904 on the Sand Spit. We lived in a small cabin outside of Nome which was between the Bering Sea and the Snake River. Our father worked in a gold mine in Alaska. He was injured by a falling bucket in the mine December 2nd, 1904 and died the next day. Because of permafrost the body could not be buried deep and when a tidal wave came years later the graves were washed out and his body was found. There was a write up of a dance hall girl in a well-known magazine about her body being washed up and recognized. (reference #7615)
3/11/2011	Nome	2678 mi	0.04 m	The March 11, 2011 a M9.1 earthquake near the east coast of Honshu, Japan, generated a devastating tsunami that was observed all over the Pacific and caused tremendous devastation locally. There were no damages reported in Nome.

Source: NCEI/WDS 2024

3.3.7.3 Location

Tsunami hazards for the Arctic region including the Bering and Chukchi Seas are traditionally considered as insignificant due to the low seismic activity in the region. Low population density and rare tide gauge network lead to the lack of information on tsunami hazards here (Medvedeva et al. 2023).

FEMA's National Risk Index provides the following map for the National Tsunami Risk (Figure 60). The tsunami risk for the Bering Strait region is labeled as having "No Rating".

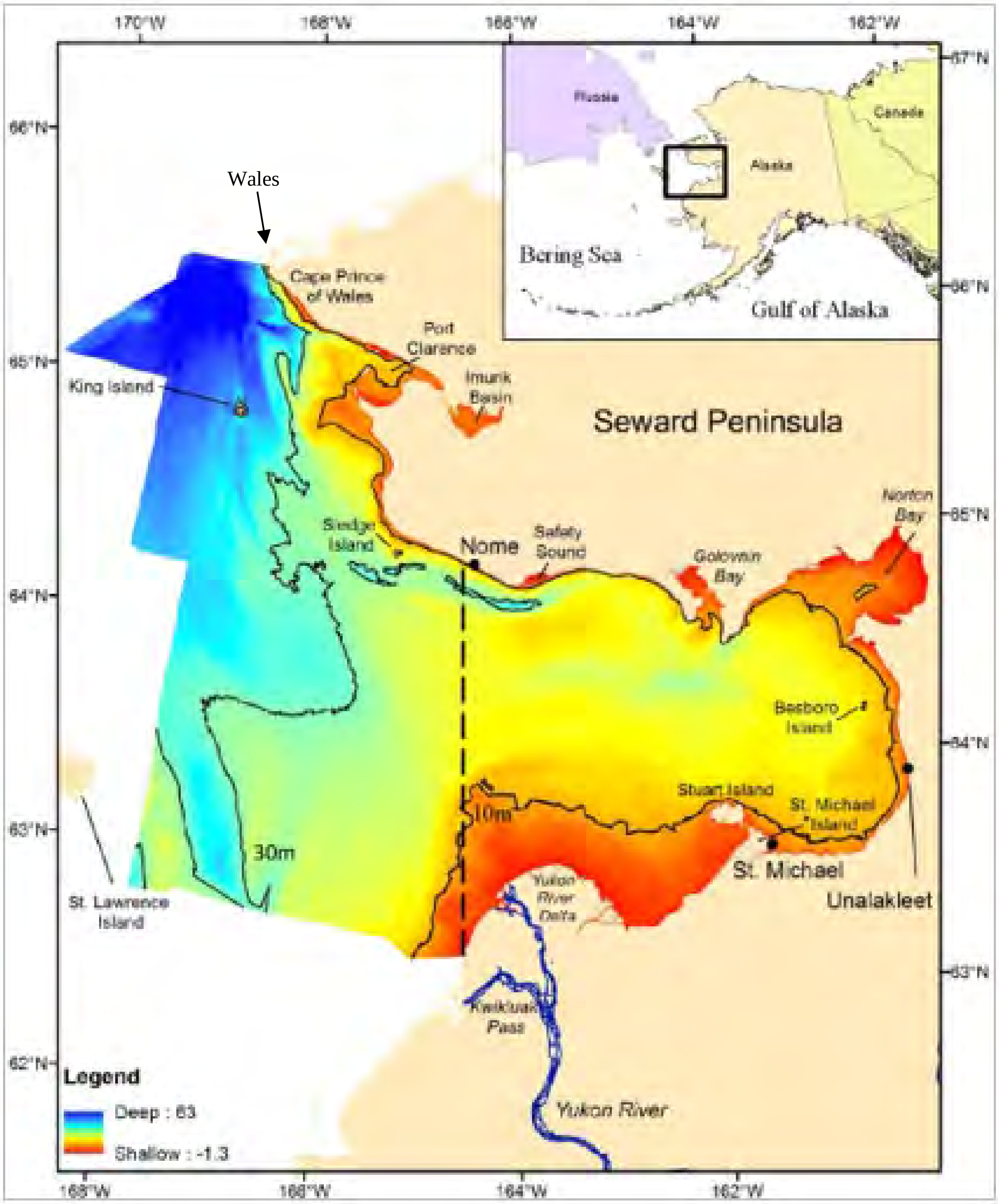


Source: FEMA National Risk Index 2024

Figure 60- National Tsunami Risk Map

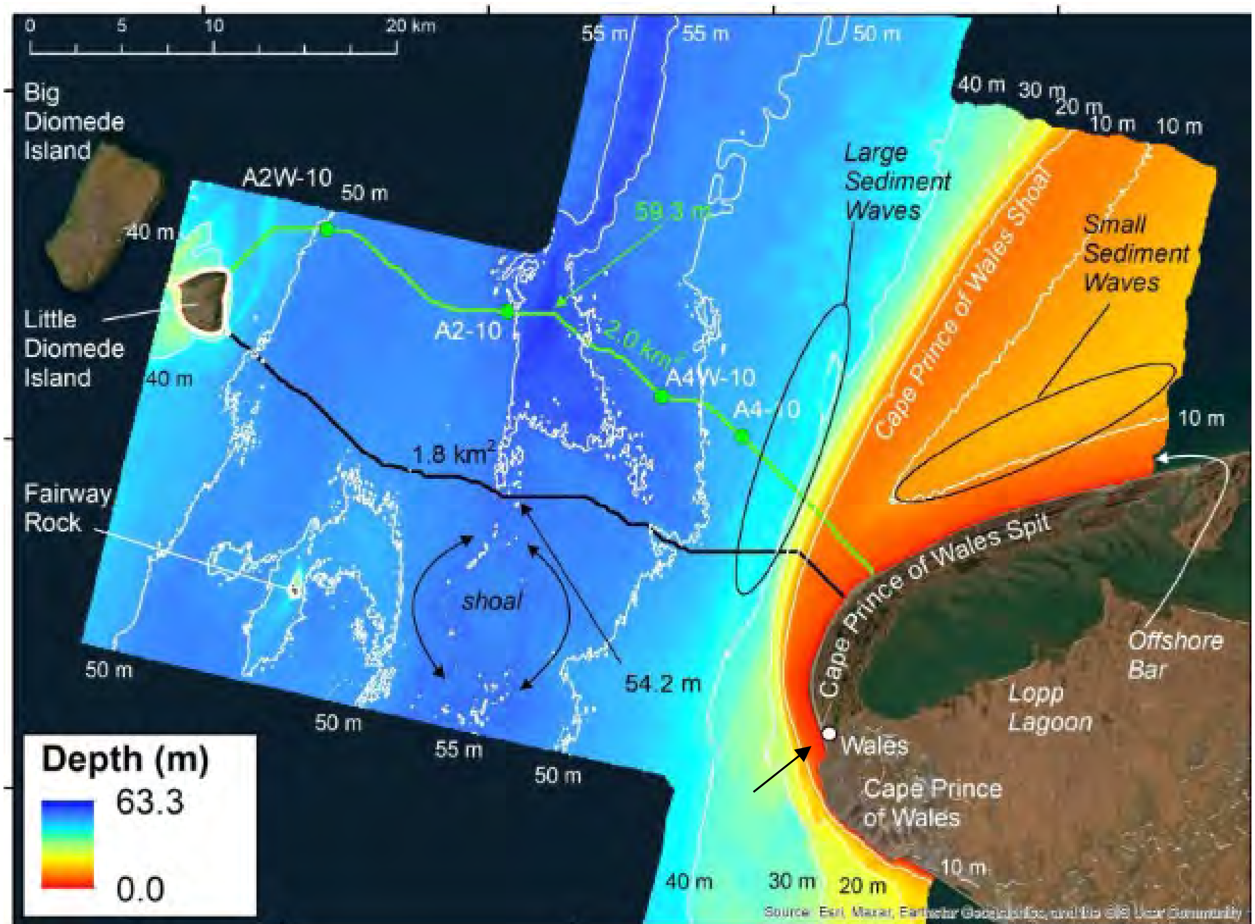
Tsunamis are not commonly reported in the Norton Sound region. This is thought to be due to the depth of the Sound and outlying Bering Sea, which may not allow for typical tsunami propagation. Compared to the average depth of the ocean, which is 12,100 feet (3,688 meters), Norton Sound is very shallow- with a maximum depth of 207 feet (63 meters) in the outer waters along the Bering Sea, while the Sound itself has an average depth of just 43 feet (13 meters) (Figure 61) (NOAA Fisheries 2022).

A tsunami would slow down in these shallower waters before it would enter deeper water again (north of Nome) before it would reach Wales. Without inundation mapping, it is difficult to predict how a tsunami would actually propagate in this region.



Source: Prescott and Zimmermann 2015

Figure 61- Bathymetry of Norton Sound



Source: NOAA Fisheries 2023

Figure 62- Bathymetry of the Eastern Channel of the Bering Strait

3.3.7.4 Extent (Magnitude and Severity)

Using the criteria listed in Table 6 as well as the absence of recorded tsunami events and inundation mapping, the extent of tsunamis in Wales are considered to be Negligible with minor injuries, the potential for critical facilities to be shut down for less than 24 hours, less than 10% of property or critical infrastructure being severely damaged.

3.3.7.5 Impact

Potential impacts from a tsunami will vary and are dependent on many factors, but impacts range from barely detectable to completely destructive. Tsunamis have an effect on 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. Tsunamis propagate outward from their source, so coasts in the “shadow” of land masses are typically safe from the effects of the tsunami.

The Cape Prince of Wales and the shoal is shallow (Figure 62) and may act as a “shadow” and protect Wales from being directly hit by a tsunami.

DGGS has a library of tsunami inundation maps for many coastal communities that are threatened by tsunamis. A tsunami inundation map has not been made for Wales, nor any community along the West Coast of Alaska.

Wales has not been historically impacted by tsunamis, but without inundation mapping, the Planning Team wanted to identify it as a potential hazard.

3.3.7.6 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 7, it is Unlikely that Wales will experience a tsunami event in the next ten years; there is a 1 in 10 years chance of occurring (1/10=10%); and the history of events is less than or equal to 10% likely per year.

The Planning Team states that they are concerned with future potential tsunamis that may impact Wales as they do not have inundation mapping and do not know the potential of a tsunami in Wales. The Planning Team expressed concerns that a tsunami would be devasting to the community.

3.3.7.7 Future Conditions Including Climate Change

Changing Factor	Description of Future Changes Due to Climate Change
Extent (Magnitude/Severity)	Sea level rise will affect water tables near coastlines and potentially lead to heightened tsunami inundation hazards (Dura et al. 2021).
Impact	Sea level rise due to climate change could significantly influence tsunami disasters as the sea level is a critical parameter affecting the intensity of tsunamis (Alhamid et al. 2022).
Probability	Due to climate change, impacts on melting permafrost and the projected increased frequency of rockslides and landslides from increased precipitation, the probability of future tsunami events as a result of these hazards may increase. Climate change is not anticipated to influence the probability of future earthquake-induced tsunamis.
Changes in population patterns	Due to the history and location of tsunami hazards in the Wales planning area, it is not likely to impact future population patterns.
Changes in land use development	Due to the history and location of tsunami hazards in the Wales planning area, it is not likely to impact future land use development.

3.3.8 EROSION

3.3.8.1 Nature

Erosion is defined as the wearing away of the ground surface as a result of the movement of wind, water, or ice. Erosion is a gradual process, but it can occur rapidly as the result of storms, floods, permafrost degradation, or another event. The effects from erosion can be seen over time as the result of long-term environmental changes such as melting permafrost.

Erosion poses a threat to communities where disappearing land threatens infrastructure and development. Wales is threatened by coastal erosion from strong Bering Sea storms.

Coastal erosion

Coastal erosion is described as the wearing or washing away of coastal lands. Coastal erosion occurs over the area near the top of the bluff out into the near-shore region to about the water depth of 30 feet. Coastal erosion is measured as the rate of change in the position or horizontal displacement of a shoreline over a period of time. Bluff recession is the most visible aspect of coastal erosion because of the dramatic change it causes to the landscape. As a result, this aspect of coastal erosion usually receives the most attention from the community.

Coastal erosion can occur from rapid, short-term, daily, seasonal, or annual natural events such as wind, waves, storm surge, coastal storms, and/or flooding. Human activities such as boat wakes and dredging may also play a factor. The most intense erosion often occurs during storms, particularly because the highest energy waves are generated under storm conditions.

Coastal erosion 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, or aquifer depletion.

Groins, jetties, seawalls, or revetments are human attempts to control shoreline erosion. As a result, these structures may actually lead to increased erosion on the opposite side of the structure.

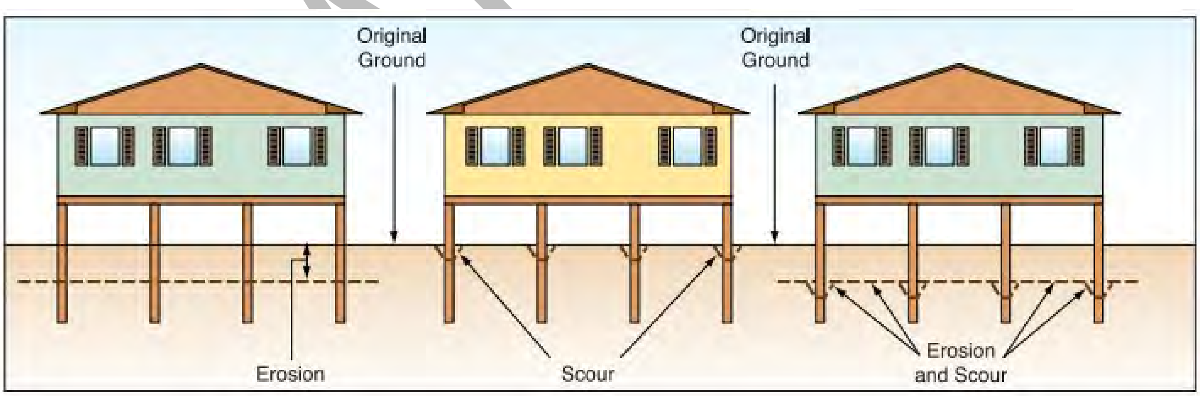
Damage from coastal erosion is typically a gradual event. However, significant storm events can cause the Earth beneath infrastructure and homes to weaken. In extreme but not unheard-of cases, homes built near the coast have fallen into the sea due to eroded cliffs.

<u>Coastal scour</u>

Scour occurs when floodwater passes around obstructions in the water column. As the water flows around an object, it must change direction and accelerate. Soil can be loosened and suspended by this process or by waves striking the object, and be carried away.

Scour effects are generally localized, ranging from small to large shallow conical depressions in the sand around individual structures. Effects from scour increase with increasing flow velocity and turbulence, and with increasing soil erodibility.

Figure 63 shows the differences between coastal erosion and scour. A building may be subject to either or both, depending on the building location.



Source: FEMA 2009- Erosion, Scour, and Foundation Design

Figure 63- Distinguishing Between Coastal Erosion and Scour

A combination of natural and human-induced factors influences the erosion process in Wales. For example, shoreline orientation and exposure to prevailing winds, open ocean swells and waves all influence erosion rates. These can be altered by human development by the addition of jetties, groins, and seawalls/revetments. Beach composition also influences erosion rates. A beach comprised of primarily large rocks and boulders is more resistant to erosion compared to a beach comprised of silt and sand. Other factors that may influence coastal erosion include:

- Geomorphology

- Nature of coastal topography
- Embankment or shoreline type
- Embankment and shoreline exposure to wind and waves
- Structure types along the shoreline
- Proximity to erosion-inducing structures
- High hazard zone encroachment
- Development density
- Elevation of river embankment; or coastal dunes and bluff

3.3.8.2 History

The USACE completed an erosion assessment for Wales during their 2009 Alaska Baseline Erosion Assessment. The Erosion Information Paper dated October 15, 2007, states:

> *A major coastal erosion event, reported to be the worst in the last 20 years, occurred during 2004. In this event, a strong storm from the Bering Sea brought high tides and winds causing flooding and erosion in 3 areas. Each area was approximately 20 feet in length and along a 6-foot-high shore bluff. The erosion caused by the 2004 storm left the* (old) *washeteria and* (now demolished) *city "Dome" buildings less than 100 feet from the active erosion area.*
>
> *Major floods in the area occurred in 1933 and 1969, although no water was reported to have entered the community. A 1974 storm caused minimal damage. A 1984 report prepared by the State of Alaska Department of Transportation and Public Facilities noted no significant erosion problems.*

The Planning Team shared that they have noticed changes in their beach due to erosion. They used to be able to play on the beach but now it is too gravely. They also shared that planes used to be able to land on the beach but now it is not wide enough for a plane to safely land on it.

3.3.8.3 Location

In Wales, erosion occurs along the Bering Sea shoreline (Figure 64 and Figure 65) (USACE 2007). Strong storms, high tides, wind and waves, and flooding are causes of and factors contributing to erosion.

The Planning Team shared that the school, old church, clinic, washeteria, teacher housing, 4 homes, the cemetery, and subsistence trails are threatened by erosion in Wales. The cemetery is built on a sand dune and during the 1918 Influenza Pandemic, many residents died and were buried in a mass grave. Caskets have begun to be exposed due to erosion.

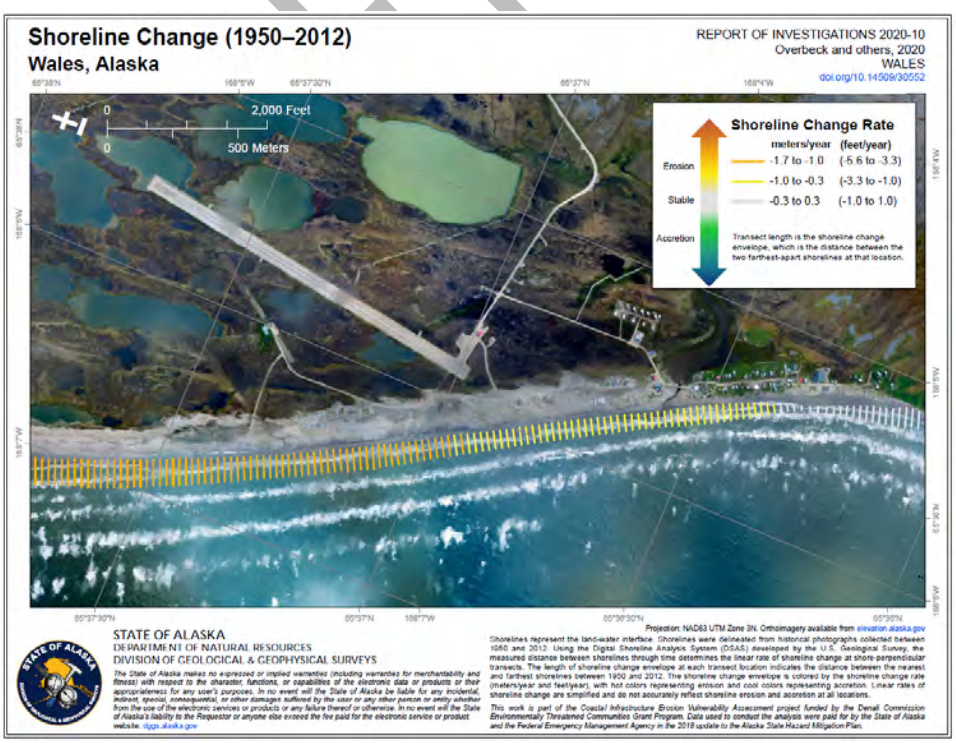
3.3.8.4 Extent (Magnitude and Severity)

The linear extent of erosion in Wales is shown below. These areas were identified by members of the community. The map is intended to show areas of erosion in Wales and does not provide rates or severity of erosion (USACE 2007).

Source: USACE 2007

Figure 64- Linear Extent of Erosion in Wales (2007)

In 2020, DGGS published long-term shoreline change maps for 48 Alaska communities. In western Alaska, shoreline change was calculated by evaluating historical and recent aerial imagery of the communities (Overbeck et. al 2020). Shoreline change in Wales from 1950-2012 is shown in Figure 65, and the maximum rate of erosion during that time period is estimated at **-5.6 feet per year** (ft/yr) with an uncertainty of +/- 0.3 ft/yr.



Source: Overbeck et al. 2020- Shoreline change at Alaska coastal communities

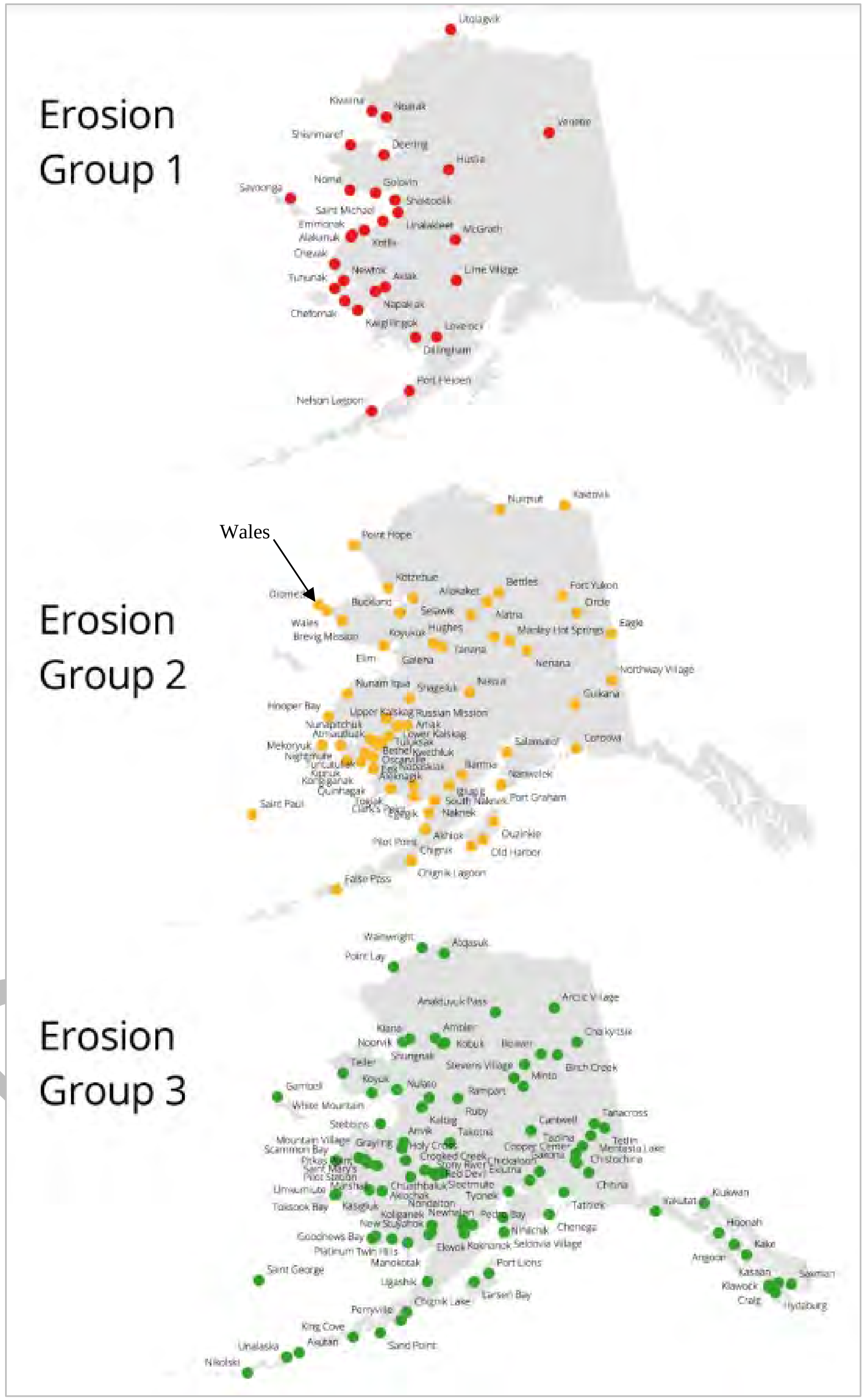
Figure 65- Shoreline Change in Wales (1950-2012)

A subsequent report by DGGS in 2021 (Erosion Exposure Assessment- Wales) summarizes the extent of erosion in Wales (Buzard et al. 2021). The report states:

> *Wales is located on the western tip of the Seward Peninsula, between the Bering Strait and the Chukchi Sea. The community is constructed on vegetated and non-vegetated sand dunes. Erosion in Wales occurs in the form of scouring during high water events such as storm surge that redistribute sand across the beach and dunes (U.S. Army Corps of Engineers [USACE], 2007).*
>
> *This coastal erosion process is non-linear because dunes can recover after storm events; sand transported to the nearshore during a storm is redistributed to the beach, and vegetation grows back. Dune and beach erosion disturb the land surface and can damage or undercut structures. Wales is exposed to erosion that may undermine infrastructure in the following 60 years, but we cannot forecast beach and dune erosion in Wales using the method by Buzard et al. (2021) because the model depends on linear erosion of a clearly identified shoreline. The shorelines delineated from aerial imagery show erosion could be up to 5.6 feet per year, but there is great uncertainty because the shorelines are not easy to identify due to wave action (Overbeck et al. 2020).*
>
> *Beach erosion and storm damage can be monitored with repeat beach elevation measurements using GPS or digital elevation models. DGGS extracted elevation profiles from a 2004 lidar digital elevation model at transects along the beach. DGGS also conducted GPS surveys in 2012 and 2015 along the same transects. At least three storms impacted Wales during this time: October 2004, September 2005, and November 2011 (USACE, 2009; Kawerak, 2012). Continued monitoring and a longer record of beach elevation can help identify whether and when infrastructure may become exposed to erosion.*

The Denali Commission 2019 Statewide Threat Assessment provides statewide risk ratings for erosion (Figure 66). Wales is located in Group 2, which are the communities that are moderately threatened by erosion. Group 2 indicates that the threat (erosion) is not expected to detrimentally impact critical infrastructure in the near term, but the community is still vulnerable to the threat. Damages resulting from a moderate flood or compounding erosion could impact operability for a limited period but would not impact the community's sustainability. An extreme event may cause damages like those described as the impact of a moderate event in Group 1. More research and data collection should be conducted to better understand the threat posed to the community. Note that a community can have a time factor of long or mid-term to be included in Group 2, depending on the severity of damage to critical infrastructure expected if an event occurs (Denali Commission 2019).

Based past erosion events, shoreline change mapping, the 2019 Denali Commission Statewide Threat Assessment, and the criteria identified in Table 6, the magnitude and severity of erosion impacts in Wales are considered Critical where injuries and/or illnesses could result in permanent disability, a complete shutdown of critical facilities may last for at least two weeks, and more than 25% of property would be severely damaged.



Source: Denali Commission 2019

Figure 66- Statewide Erosion Threat Risk Map

3.3.8.5 Impact

Impacts from erosion 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 erosion.

The 2007 USACE Erosion Assessment describes potential damages from erosion in Wales:

> *The cemetery, sewer lines, and septic leach fields (see Figure 64) are community buildings and associated improvements near the coast considered to be at risk from coastal erosion during strong storms. The community, except for a few buildings on the hillside is within the 100-year floodplain. There is at least one home at risk now built on the sand dune on the beach at about 50 feet or less from the coast. The homeowners have put out sandbags to help slow the erosion from their home.*
>
> *No protective measures have been installed to reduce erosion damage. Identified at-risk facilities have been considered for repair or relocation. The survey respondent stated that Federal Emergency Management Agency estimated costs for repairs at present levels of damage to be about $1,300 for fuel tanks, $ 3,500 for the cemetery, $4,200 for the washeteria leach field, and $4,100 for the city dome leach field.*
>
> <u>Note: The estimates listed above are from 2007 and may be no longer accurate. The city dome was demolished in 2017.</u>

The Planning Team shared that many facilities in Wales have been impacted by erosion including the school, old church, clinic, washeteria, teacher housing, 4 homes, the cemetery, and subsistence trails.

Shows the damage to the road to Tin City following Typhoon Merbok.

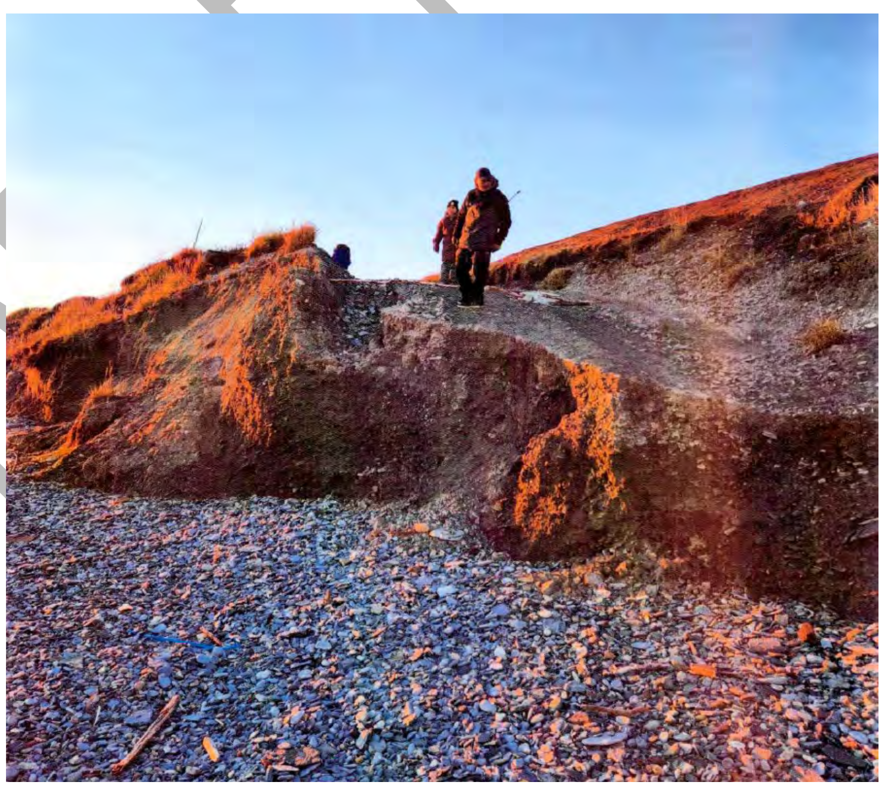
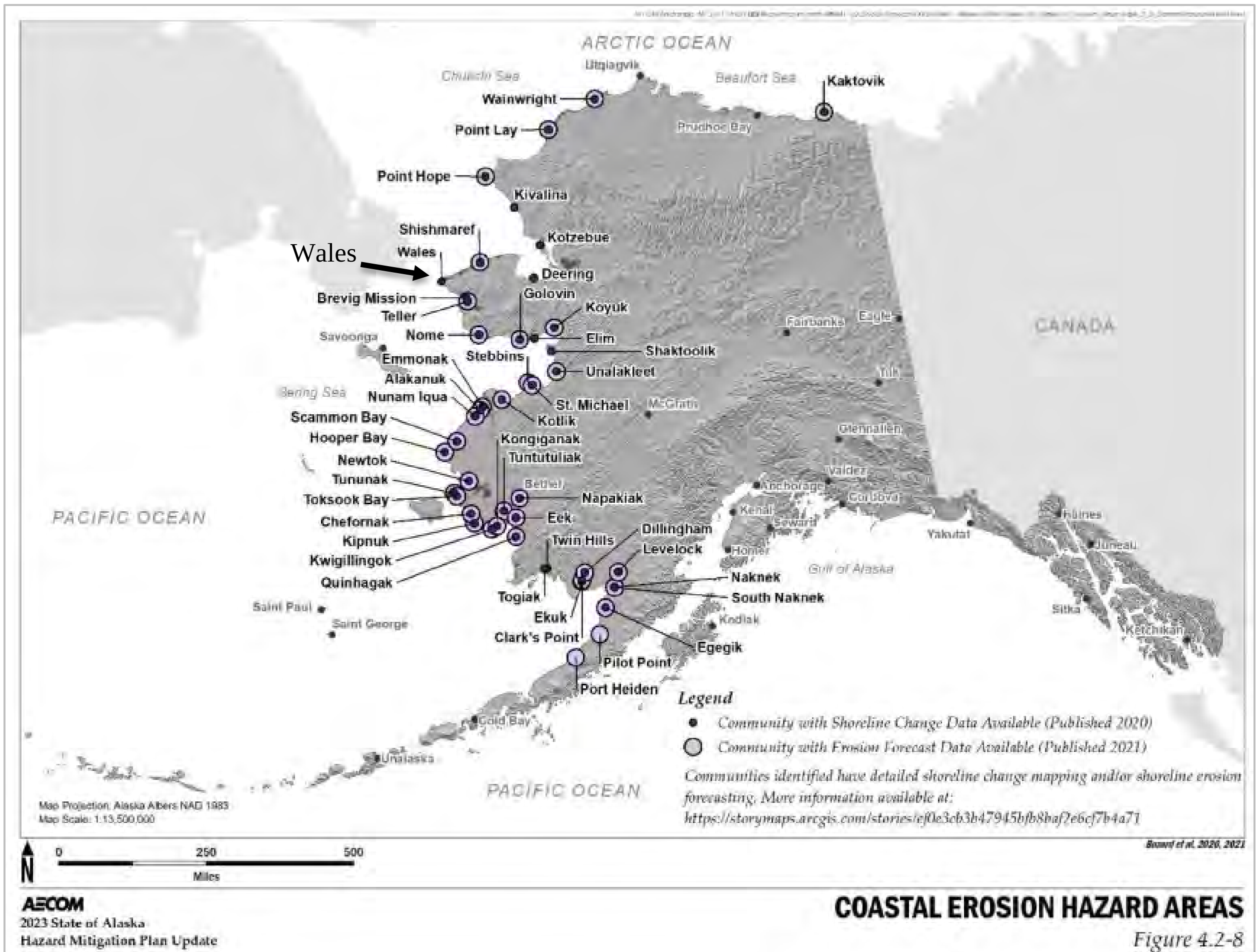


Photo Credit: Anna Oxereok, Native Village of Wales

Figure 67- Erosion Damage to the Road to Tin City Due to Typhoon Merbok (September 2022)

3.3.8.6 Probability of Future Events

The 2023 State of Alaska SHMP identifies coastal erosion hazard areas across the state. Wales is located in an identified coastal erosion hazard area.



Source: DHS&EM 2023

Figure 68- Statewide Coastal Erosion Hazard Areas

Based on the 2007 USACE baseline erosion assessment, historical impacts, erosion shoreline change report and the criteria identified in Table 7, it is Likely that Wales will experience erosion 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.

3.3.8.7 Future Conditions Including Climate Change

Climate change is not anticipated to influence the nature of future erosion events in Wales.

Changing Factor due to Climate Change	Description of Future Changes due to Climate Change
Location	As the extent of erosion increases, new facilities may be impacted that are not currently impacted by erosion.

Changing Factor due to Climate Change	Description of Future Changes due to Climate Change
Extent (Magnitude/Severity)	Increased severity and magnitude of winter storms, loss of coastal sea ice, sea level rise, and increased precipitation are already increasing the severity and magnitude of erosion events in Alaska, and the trend is expected to continue. This will lead to increased damage to infrastructure, especially in Alaska's coastal villages (Larsen et al. 2008).
Impact	The primary climatic forces affecting erosion are changes in temperature, water levels, precipitation, vegetation loss/changes, and storms. All of these factors are anticipated to be affected by climate change, which will result in increased localized impacts from erosion in Alaska.
Probability of Future Events	Increased precipitation, increased frequency and intensity of winter storms, and sea level rise are all expected to continue, which will continue to increase erosion events in Alaska (Larsen et al. 2008).
Changes in population patterns	Due to the location of erosion hazards in the Wales planning area, it is not likely to impact future population patterns.
Changes in land use development	Due to the location of erosion hazards in the Wales planning area, it is possible to impact future land use development.

3.3.9 LANDSLIDE

3.3.9.1 Nature

Ground failure is a blanket term used to describe any ground movement mechanisms including avalanche, landslide, subsidence, and unstable soils gravitational or other soil movement. Soil movement may be caused by activities such as rain, snow, and/or water saturation induced avalanches or landslides. Seismic activity, melting permafrost, river or coastal embankment undercutting, or in combination with steep slope conditions are also conditions for soil movement.

Landslides are a dislodgment and fall of a mass of soil or rocks along a sloped surface, or for the dislodged mass itself. The term is used for varying phenomena, including mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, and slump-earth flows. The susceptibility of hillside and mountainous areas to landslides depends on variations in geology, topography, vegetation, and weather. Landslides may also be triggered or exacerbated by indiscriminate development of sloping ground, or the creation of cut-and-fill slopes in areas of unstable or inadequately stable geologic conditions.

Additionally, avalanches and 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 avalanches and landslides.
- Climate change-related 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:

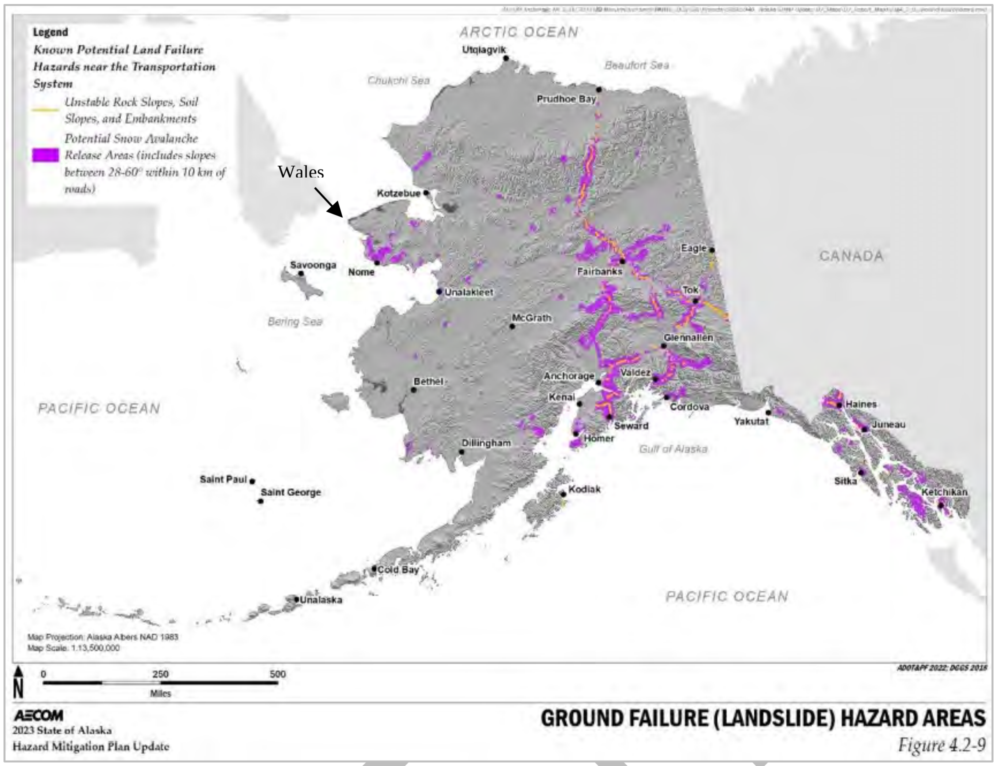
1. **Slides**, the more accurate and restrictive use of the term landslide, refers to a mass movement of material, originating from a discrete weakness area that slides from stable underlying material. A *rotational slide* occurs when there is movement along a concave surface; a *translational slide* originates from movement along a flat surface.
2. **Debris Flows** arise from saturated material that generally moves rapidly down a slope. A debris flow usually mobilizes from other types of landslides on a steep slope, and then flows through confined channels, liquefying and gaining speed. Debris flows can travel at speeds of more than 35 miles per hour (mph) for several miles. Other types of flows include debris avalanches, mudflows, creeps, earth flows, debris flows, and lahars.
3. **Lateral Spreads** are a type of landslide generally occurs on gentle slope or flat terrain. Lateral spreads are characterized by liquefaction of fine-grained soils. The event is typically triggered by an earthquake or human-caused rapid ground motion.
4. **Falls** are the free-fall movement of rocks and boulders detached from steep slopes or cliffs.
5. **Topples** are rocks and boulders that rotate forward and may become falls.
6. **Complex** is any combination of landslide types.

3.3.9.2 History

There has not been a landslide documented in Wales, however, the Planning Team states that an avalanche on Razorback Mountain resulted in a fatality in the early 1900s.

3.3.9.3 Location

The 2023 State of Alaska SHMP identifies land failure hazard locations across the state (Figure 69). These hazard areas are defined by any slopes between 28-60º within 10km of roads. Wales is located in a potential snow avalanche release and landslide area.



Source: DHS&EM 2023

Figure 69- Landslide Hazard Areas in Alaska

One of Wales' most notable landmarks is Razorback Mountain, which gently bends to 2,297-foot-high Cape Mountain that dives into the Bering Strait (Figure 70). At the base of the mountain, the sea laps at a giant slab of granite shaped like an axe blade. Cape Mountain has a geology comprised of granites and fine-grained porphyries.

Photo Credit: Christian Graham

Figure 70- Razorback Mountain in Wales

3.3.9.4 Extent (Magnitude and Severity)

Damage from landslides ranges from minor with minimal repairs required to a massive economic impact with the possible destruction of critical community infrastructure such as transportation or critical structures.

Based on the lack of landslide history and the criteria identified in Table 6, the extent of ground failure and resultant damages to people and infrastructure in Wales is considered to be Negligible with minor injuries, the potential for critical facilities to be shut down for less than 24 hours, less than 10% of property or critical infrastructure being severely damaged.

3.3.9.5 Impact

Impacts associated with landslides include surface subsidence, infrastructure, building, and/or road damage. Subsidence in bluffs may cause the ground to become less stable, potentially increasing the probability and impact of landsides.

3.3.9.6 Probability of Future Events

Based on previous occurrences and the criteria identified in Table 7, it is Possible that Wales 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.

3.3.9.7 Future Conditions Including Climate Change

Climate change is not anticipated to impact the nature of future landslides in Wales.

Changing Factor due to Climate Change	Description of Future Changes due to Climate Change
Location	Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from thawing permafrost (IPCC 2019).
Extent (Magnitude and Severity)	Landslides are expected to increase in magnitude with increased areas of effect as permafrost thaws (IPCC 2019).
Impact	Landslides are projected to occur in areas where there is no history of previous events due to the destabilization of mountain slopes from thawing permafrost (IPCC 2019), which could increase future impacts to Wales.
Probability of Future Events	An increase in storms and rainfall as well as destabilization of mountain slopes is anticipated to support an increase in landslides.
Changes in population patterns	Due to the location of landslide hazards in the Wales planning area, it is possible to impact future population patterns.
Changes in land use development	Due to the location of landslide hazards in the Wales planning area, it is likely to impact future land use development.

3.4 SUMMARY OF VULNERABILITY

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

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

Regulation Checklist- 44 CFR § 201.7 Tribal Mitigation Plans
ELEMENT B. Hazard Identification and Risk Assessment
B3. Does the plan include a description of each identified hazard’s impact, as well as an overall summary of the vulnerability of the tribal planning area? [44 CFR § 201.7(c)(2)(ii)]
Source: FEMA 2017 (Tribal)

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)) B2-a. Does the plan provide an overall summary of each jurisdiction’s vulnerability to the identified hazards? B2-b. For each participating jurisdiction, does the plan describe the potential impacts of each of the identified hazards on each participating jurisdiction? B2-c. Does the plan address NFIP-insured structures within each jurisdiction that have been repetitively damaged by floods?
Source: FEMA 2022 (Local)

3.4.1 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 communities to focus their efforts and attention on areas with the greatest risk of damage.

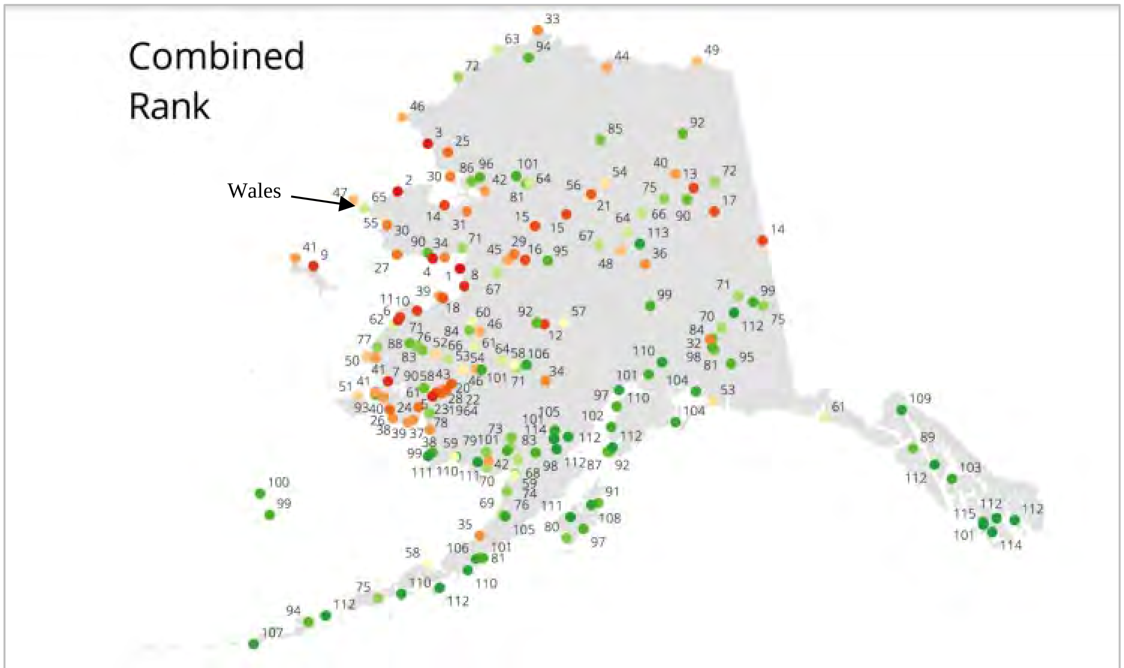
The Native Village and City of Wales are located in the same geographic area and thus experience the same vulnerability to hazards.

Table 19 shows the overview of the Native Village and City of Wales’ hazard vulnerability.

Table 19- Vulnerability Overview

Hazard	Area’s Hazard Vulnerability			
	% of Jurisdiction’s Geographic Area	% of Population	% of Residences	% of Critical Facilities
Earthquake	100	100	100	100
Severe Weather	100	100	100	100
Wildland/Tundra Fire	100	100	100	100
Changes in the Cryosphere	100	100	100	100
Naturally Occurring Uranium	100	100	100	100
Flood	30	10	10	25
Tsunami	30	10	10	25
Erosion	10	0	0	0
Landslide	5	0	0	0

The 2019 Denali Commission 2019 Statewide Threat Assessment provides a map of the combined threat for the 187 rural communities evaluated in the study (Figure 71). The communities with the greatest combined threat are dark red while the communities with the lowest combined threat are shown in dark green. The color gradient shown in the legend depicts the relative ranking of all communities. Overall, Wales ranked 65 out of 115 (yellow-green).



Source: Denali Commission 2019

Figure 71- Statewide Combined Threat Risk Map

3.4.2 CULTURAL AND SACRED SITE SENSITIVITY

Anyone desiring information concerning culturally sensitive information must contact the Tribal office for assistance.

3.4.3 POPULATION AND BUILDING STOCK

Population data for Wales was obtained from the DCRA's 2022 certified population data.

Estimated replacement values for residential building structures were obtained from the 2021 US Census, which estimated the median home value per structure was $75,000. Replacement costs in Alaska typically exceed US Census structure estimates due to material purchasing, barge or airplane delivery, and construction in Alaska, therefore, residential replacement values are generally understated.

The United States Department of Housing and Urban Development (HUD) estimates an average 3-bedroom residential structure in Wales has a replacement value of $724,888 (HUD 2022). The more conservative HUD approximation for replacement value was used for this analysis. A total of 99 housing units were considered in this analysis.

Table 20- Estimated Population and Building Inventory

Population	Residential Buildings	
DCCED 2020 Data	Total Housing Units (per Planning Team)	Total Value of Buildings*
168	35	US Census: $7,425,000 HUD: **$25,371,080** (used for analysis)

Sources: US Census 2021- Wales city population data, DCRA 2024, HUD 2022.

*The 2021 US Census estimates median house value at $75,000. However, the United States Department of Housing and Urban Development (HUD) determined that the average structural replacement value of a 3-bedroom residential building in Wales is $724,888 per structure.

3.4.4 VULNERABILITY ASSESSMENT METHODOLOGY

To complete this analysis, the 2004 DCRA community profile and 2015 City of Wales HMP (APA- never adopted) was used as the basis for critical facilities in Wales. The Planning Team provided information on newly constructed facilities and these critical facilities were then mapped in relation to a potential hazard's threat exposure and vulnerability.

Hazard	Methodology
Earthquake Severe Weather Wildland/ Tundra Fire	It is assumed that the entire Planning Area is threatened by earthquakes, severe weather, and wildland/tundra fires. DGGS's Quaternary Fault and Folds Database was used to determine which faults are near the Villages and an earthquake risk map (Figure 13) was used to determine the potential PGA and resultant damages/intensity in Wales.
Changes in the Cryosphere	Permafrost hazard areas were determined by using a permafrost zones layer on ArcGIS. Any facilities with underlying permafrost were labeled as threatened by thawing permafrost.
	Sea ice hazards are not anticipated to cause infrastructure damage. Impacts from the decrease in sea ice extent is discussed with impacts to subsistence and food sovereignty.
	Snow avalanche hazard areas were determined by the Planning Team and through historical event locations.
Naturally Occurring Uranium	Uranium hazard areas were determined through DEC's Drinking Water Program reports. Uranium exposure is a public health concern, but is not anticipated to cause infrastructure damage.
Flood	At the time of this Risk Assessment, Wales does not have a Flood Insurance Study to identify the 1% percent (100-year) annual chance of flood. Critical facilities threatened by flooding were determined by the Planning Team, historically flooded locations/facilities, and agency reports.
Tsunami	At the time of this Risk Assessment, Wales does not have tsunami inundation mapping. The same methodology used to determine flood hazard areas was used to estimate potential damages from a tsunami until formal inundation mapping is completed.
Erosion	Erosion hazard areas were determined by the Planning Team, agency reports (DGGS, USACE), and other scientific studies.
Landslide	Landslide hazard areas were determined by the Planning Team as well as historical landslides in Alaska DOT's historical landslide inventory (none were documented in Wales).

An analysis was conducted to assess the risks of each identified hazard. 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.

3.4.5 DATA LIMITATIONS

The provided vulnerability estimates use the best data currently available, and the methodologies used result in a risk approximation. 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.

It should be noted that the results from the quantitative vulnerability assessment are limited to the exposure of people, buildings, and critical facilities and infrastructure to the identified hazards. It was beyond the scope of this MJHMP to develop a more detailed or comprehensive assessment of risk. A more comprehensive assessment may include loss of facility/system function, annualized losses, people injured or killed, shelter requirements, and/or economic losses. Such impacts may be addressed with future updates of this MJHMP or other planning documents.

3.4.6 ASSET INVENTORY

Assets that may be affected by hazard events include population, residential buildings, and critical facilities and infrastructure.

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 in Wales and fulfilling important public safety, emergency response, and disaster recovery functions.

The critical facilities profiled in this plan include the following:

- Government facilities
- Emergency response services
- Educational facilities
- Medical facilities
- Roads and bridges
- Transportation facilities
- Utilities
- Community facilities

Table 21- Critical Facilities and Infrastructure in Wales

Facility Type	# of Occupants	Facility Name	Address	Latitude	Longitude	Estimated Value	Building Type	Facility Owner	Cryosphere	Earthquake	Flood	Erosion	Landslide	Severe Weather	Tsunami	Volcano	Tundra Fire	Uranium
Government	7	Tribal Office (secondary shelter location)		65°36'38"N	168°05'23"W	$500,000	W2	NVOW	x	x				x			x	
	2	City Office		65°36'32"N	168°05'28"W	$500,000	W2	COW	x	x				x			x	
	1	Post Office		65°36'38"N	168°05'22"W	$250,000	W2	Gov't	x	x				x			x	
	6	Wales Native Corporation Office		65°36'24"N	168°05'18"W	$750,000	W2	WNC	x	x	x			x	x		x	
Emergency Response	0	Fire Dept- Code Red		65°36'41"N	168°05'18"W	$75,000	N/A	COW	x	x				x			x	
Education	42	Kingikmiut School (primary shelter location)		65°36'18"N	168°05'09"W	$17,000,000	W2	BSSD	x	x	x	x		x	x		x	
Medical	1	Toby A. Health Clinic		65°36'21"N	168°05'10"W	$1,500,000	W2	NSHC	x	x	x	x		x	x		x	
	5	New Clinic		65°36'42"N	168°05'20"W	$3,000,000	W2	NSHC	x	x				x			x	
Roads/ Bridges	0	15.5 miles of road				$9,100,000	Gravel		x	x				x			x	
	0	Village Creek Bridge		65°36'34"N	168°05'29"W	$50,000	Bridge	COW	x	x				x			x	
Transportation	0	Wales Airport		65°37'22"N	168°05'42"W	$17,000,000	Airport	DOT	x	x				x			x	
	1	Airport Maintenance Shop		65°36'59"N	168°05'37"W	$1,758,077	W2	DOT	x	x				x			x	
	0	Lopp Lagoon Boat Launch		65°37'35"N	168°02'25"W	$750,000	N/A	COW	x	x				x			x	

Table 21- Critical Facilities and Infrastructure in Wales

Facility Type	# of Occupants	Facility Name	Address	Latitude	Longitude	Estimated Value	Building Type	Facility Owner	Cryosphere	Earthquake	Flood	Erosion	Landslide	Severe Weather	Tsunami	Volcano	Tundra Fire	Uranium
Utilities	0	Groundwater Wells (2)		65°36'56"N	168°04'26"W	$120,000	N/A	COW	x	x			x	x			x	
	0	500-gallon water storage		65°36'31"N	168°05'27"W	$85,000	PWTS	COW	x	x				x			x	
	0	BSSD water storage tanks		65°36'16"N	168°05'10"W	$500,000	PWTS	BSSD	x	x	x			x	x		x	
	0	Septic Systems x2		65°36'14"N	168°05'05"W	$225,000	WWTS	COW	x	x				x			x	
	0	Landfill (Class 3 9932-BA001)		65°37'12"N	168°06'18"W	$25,000	N/A	COW	x	x	x			x	x		x	
	0	Wales Tank Farm		65°36'22"N	168°05'06"W	$1,000,000	PWTS	COW	x	x				x			x	
	0	Power Plant		65°36'30"N	168°05'26"W	$800,000	EPPS	AVEC	x	x				x			x	
	0	Windmills (non-operable)		65°36'57"N	168°05'13"W	$800,000	EPPS	KEA	x	x				x			x	
	0	AT&T Alascom		65°36'57"N	168°05'18"W	$500,000	CBO	AT&T	x	x				x			x	
	0	GCI		65°36'58"N	168°05'22"W	$250,000	CBO	GCI	x	x				x			x	
	0	Sewage Lagoon		65°37'23"N	168°06'01"W	$1,000,000	PWSO	COW	x	x				x			x	
Community	1	Multi-Purpose Building		65°36'41"N	168°05'20"W	$2,500,000	W2	NVOW	x	x				x			x	
	0	Storage Vans by Multi x2		65°36'41"N	168°05'20"W	$100,000	N/A	NVOW	x	x				x			x	
	1	Washeteria (existing)		65°36'32"N	168°05'28"W	$2,500,000	W2	COW	x	x	x	x		x	x		x	
	1	Washeteria (new)		65°36'31"N	168°05'28"W	$4,000,000	W2	COW	x	x				x			x	
	5	Teacher Housing 4-plex		65°36'19"N	168°05'08"W	$350,000	W2	WNC	x	x	x	x		x	x		x	
	3	Teacher Housing 2-plex		65°36'19"N	168°05'08"W	$350,000	W2	BSSD	x	x	x	x		x	x		x	
	0	Community Plot		65°36'59"N	168°05'21"W	$100,000	Gravel	TRI-Entities	x	x				x			x	
	1	Morgue		65°36'43"N	168°05'20"W	$150,000	W2	NSHC	x	x				x			x	

Table 21- Critical Facilities and Infrastructure in Wales

Facility Type	# of Occupants	Facility Name	Address	Latitude	Longitude	Estimated Value	Building Type	Facility Owner	Cryosphere	Earthquake	Flood	Erosion	Landslide	Severe Weather	Tsunami	Volcano	Tundra Fire	Uranium
	1	ARCS		65°36'44"N	168°05'20"W	$250,000	W2	WNC/ COW	x	x				x			x	
	2	Church		65°36'20"N	168°05'12"W	$300,000	W2	Wales Lutheran	x	x	x	x		x	x		x	
	2	Parsonage		65°36'20"N	168°05'13"W	$300,000	W2	Wales Lutheran	x	x	x			x	x		x	
	1	Wales Native Store		65°36'21"N	168°05'14"W	$500,000	W2	NVOW	x	x	x			x	x		x	
	0	Cemetery		65°36'48"N	168°05'46"W	Undefined	N/A	COW	x	x	x	x		x	x		x	
	0	Tin City LRRS (tertiary shelter location)		65°33'53"N	167°58'03"W	Undefined	Concrete	US Air Force	x	x				x			x	
	0	Culturally Sacred or Significant Sites																
	0	Subsistence Camps																
Total:	83				Total:	**$68,938,077**												

Uranium in drinking water is a public health concern, but impacts are not anticipated to cause infrastructure damage.

Note: Locations of culturally sacred or significant sites and subsistence camps are confidential. If you need assistance with these locations and loss estimates, please contact the Native Village of Wales.

Figure 72- Map of Critical Facilities in Wales

3.4.7 Vulnerability Exposure Analysis

Table 22 summarizes the results of the vulnerability exposure analysis for loss estimations in Wales.

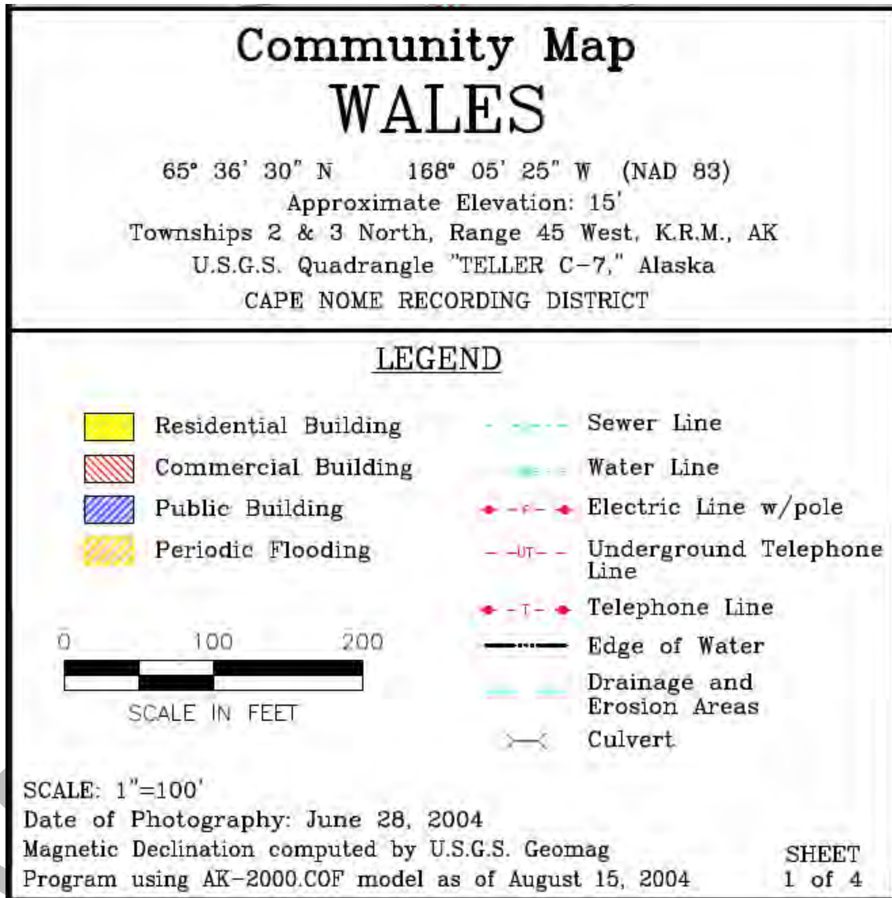
Table 22- Vulnerability Exposure Analysis

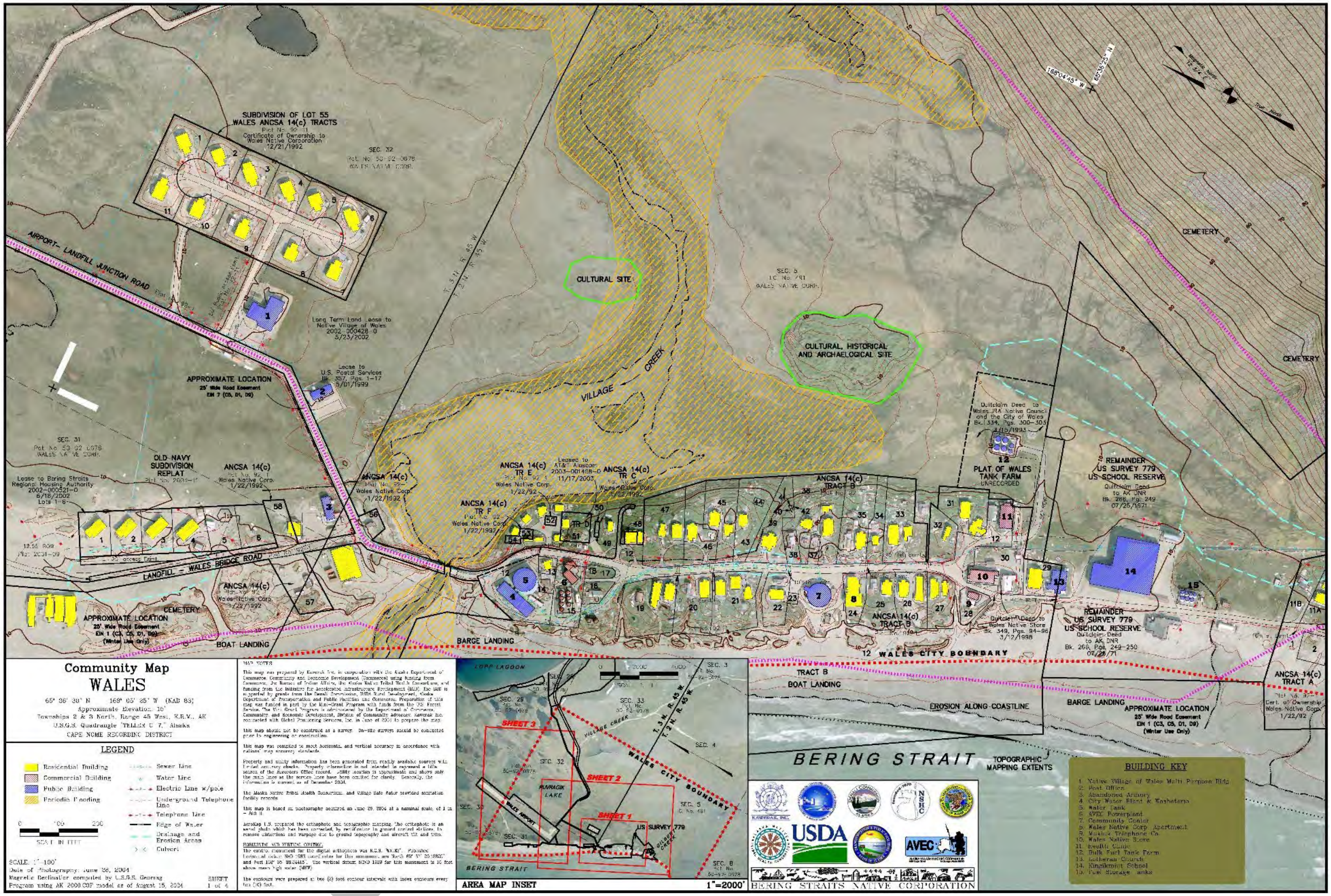
	Government Facilities	Emergency Response	Education Facilities	Medical Facilities	Roads/Bridges	Transportation Facilities	Utilities	Community Facilities	Total
Earthquake	# of CFs: 4 Value: $2,00,000	# of CFs: 1 Value: $75,000	# of CFs: 1 Value: $17,000,000	# of CFs: 2 Value: $4,500,000	# of CFs: 15.5 miles of road, 1 bridge Value: $9,150,000	# of CFs: 3 Value: $19,508,077	# of CFs: 14 Value: $5,305,000	# of CFs: 16 Value: $11,650,000	# of CFs: 37 Value: $69,188,077
Severe Weather	# of CFs: 4 Value: $2,00,000	# of CFs: 1 Value: $75,000	# of CFs: 1 Value: $17,000,000	# of CFs: 2 Value: $4,500,000	# of CFs: 15.5 miles of road, 1 bridge Value: $9,150,000	# of CFs: 3 Value: $19,508,077	# of CFs: 14 Value: $5,305,000	# of CFs: 16 Value: $11,650,000	# of CFs: 37 Value: $69,188,077
Wildland/ Tundra Fire	# of CFs: 4 Value: $2,00,000	# of CFs: 1 Value: $75,000	# of CFs: 1 Value: $17,000,000	# of CFs: 2 Value: $4,500,000	# of CFs: 15.5 miles of road, 1 bridge Value: $9,150,000	# of CFs: 3 Value: $19,508,077	# of CFs: 14 Value: $5,305,000	# of CFs: 16 Value: $11,650,000	# of CFs: 37 Value: $69,188,077
Changes in the Cryosphere	# of CFs: 4 Value: $2,00,000	# of CFs: 1 Value: $75,000	# of CFs: 1 Value: $17,000,000	# of CFs: 2 Value: $4,500,000	# of CFs: 15.5 miles of road, 1 bridge Value: $9,150,000	# of CFs: 3 Value: $19,508,077	# of CFs: 14 Value: $5,305,000	# of CFs: 16 Value: $11,650,000	# of CFs: 37 Value: $69,188,077
Uranium	Uranium in drinking water is a public health concern, but impacts are not anticipated to cause infrastructure damage.								
Flood	# of CFs: 1 Value: $750,000	-	# of CFs: 1 Value: $17,000,000	# of CFs: 1 Value: $1,500,000	-	-	# of CFs: 2 Value: $525,000	# of CFs: 7 Value: $4,300,000	# of CFs: 12 Value: $24,075,000
Tsunami	# of CFs: 1 Value: $750,000	-	# of CFs: 1 Value: $17,000,000	# of CFs: 1 Value: $1,500,000	-	-	# of CFs: 2 Value: $525,000	# of CFs: 7 Value: $4,300,000	# of CFs: 12 Value: $24,075,000
Erosion	-	-	# of CFs: 1 Value: $17,000,000	# of CFs: 1 Value: $1,500,000	-	-	-	# of CFs: 5 Value: $3,500,000	# of CFs: 7 Value: $22,000,000
Landslide	-	-	-	-	-	-	# of CFs: 1 Value: $120,000	-	# of CFs: 1 Value: $120,000

3.4.8 LAND USE IN WALES

In Wales, there are some possible land areas for future development projects if care is taken not to build on existing gravesites or wetlands. There are known sites near city limits which should not be used due to contamination or other issues (Wales 2011-2016 LEDP).

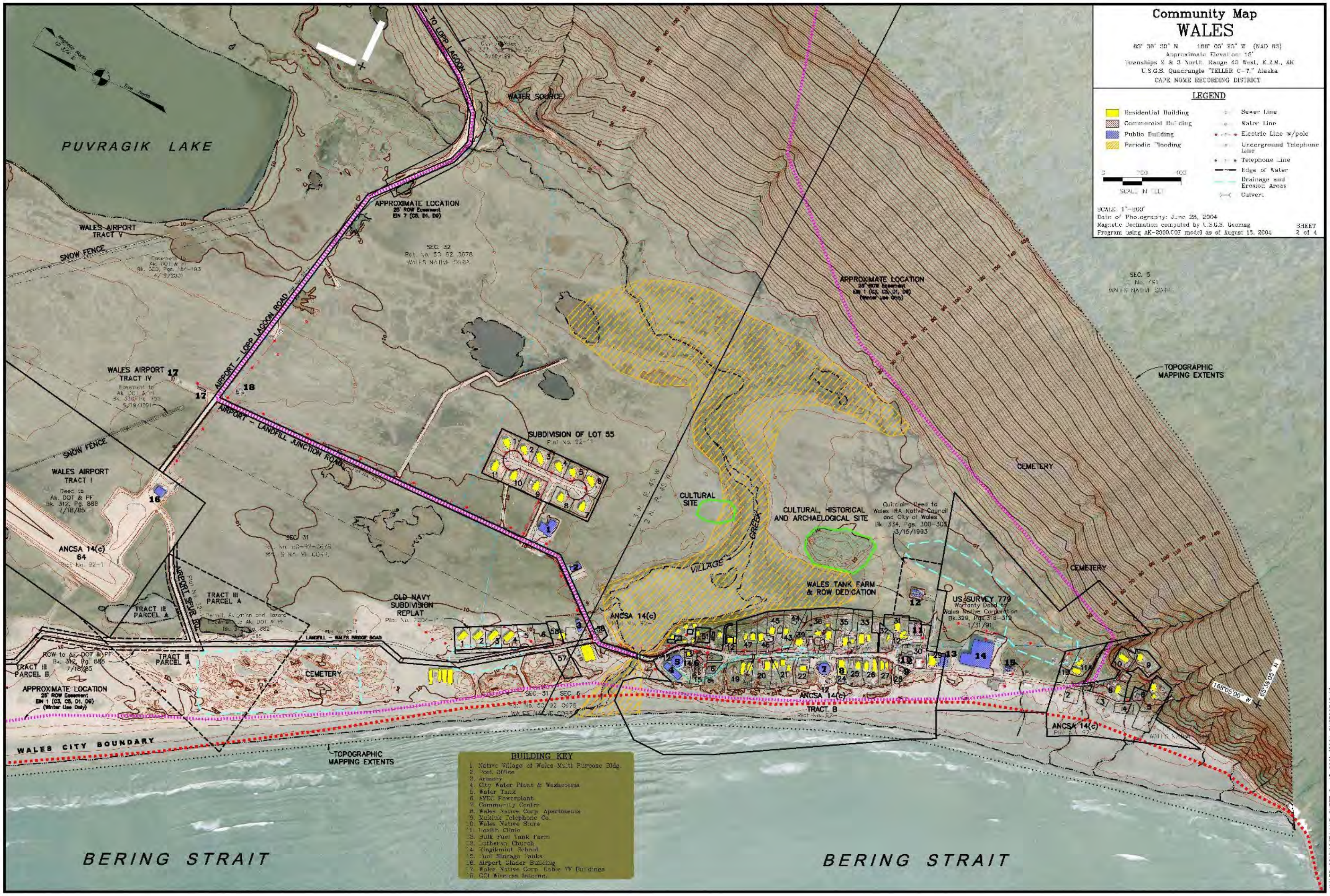
Figure 73 to Figure 76 shows the 2004 DCRA community profile maps of Wales. The legend for these maps is below.





Source: DCRA 2004

Figure 73- Wales Community Map (2004) (1 of 3)

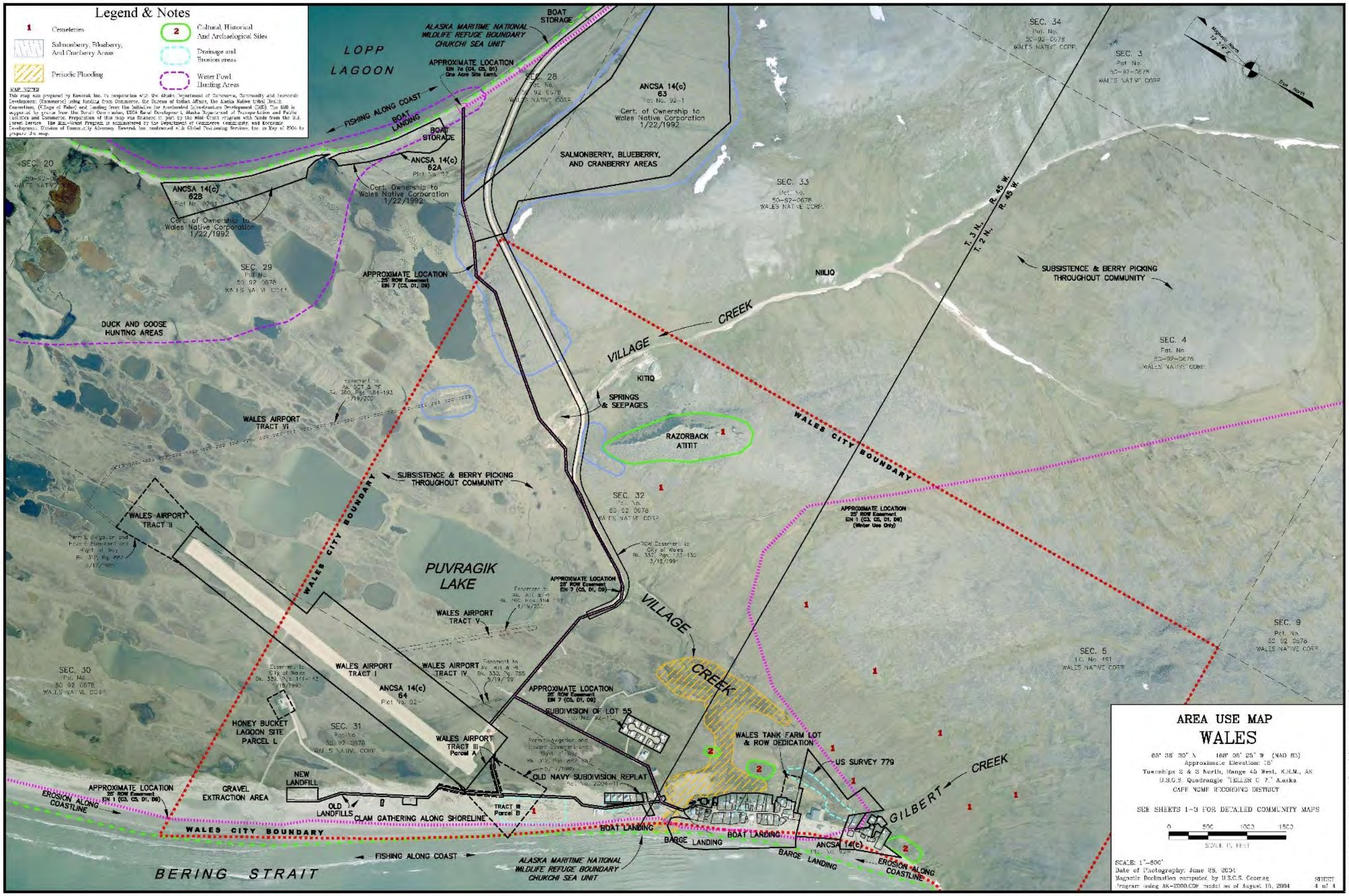


Source: DCRA 2004

Figure 74- Wales Community Map (2004) (2 of 3)

Source: DCRA 2004

Figure 75- Wales Community Map (2004) (3 of 3)



Source: DCRA 2004

Figure 76- Wales Area Map (2004)

3.4.9 FUTURE DEVELOPMENT

The Native Village and City of Wales aim to maintain and upgrade their aging infrastructure. Table 23 contains a list of the community's completed capital improvement projects from 1997-2010. This information is no longer tracked by DCRA.

Table 23- Wales' Completed Capital Improvement Projects (1997-2010)

Fiscal Year	Project Description/Comments	Total Cost	Contractor	Lead Agency
2010	Lagoon Repair and Expansion - Comments: Design & construction of a washeteria, water treatment plant & associated wastewater treatment & disposal systems as the long-term alternative to meeting the sanitation needs.	$783,990	City of Wales	DEC/VSW
2009	Heavy Equipment Purchase- Legislative Grant	$300,000	City of Wales	DCRA
2009	Indian Housing Block Grant - Comments: NAHASDA administration, operating & construction funds	$126,175	BSRHA	HUD
2009	Community Facilities Repair and Maintenance and Equipment and Parts Purchase - Comments: Legislative	$57,646	City of Wales	DCRA
2008	Well Water Supply Main	$418,020		ANTHC
2008	Indian Housing Block Grant - Comments: NAHASDA administration, operating & construction funds	$112,569	BSRHA	HUD
2007	Indian Housing Block Grant - Comments: NAHASDA administration, operating & construction funds Indian Housing Block Grant	$130,446	BSRHA	HUD
2006	Indian Housing Block Grant - Comments: NAHASDA administration, operating & construction funds	$129,826	BSRHA	HUD
2006	Community Facilities and Equipment - Comments: Capital Matching	$50,176	City of Wales	DCRA
2006	City Facilities Repair and Maintenance - Comments: Legislative Grant	$25,000	City of Wales	DCRA
2005	Washeteria Water Supply/Septic System - Comments: OTHER FUNDING: EPA/IG - 2005 -$168,700.	$225,000		DEC/VSW
2005	Indian Housing Block Grant - Comments: NAHASDA administration, operating & construction funds	$128,307	BSRHA	HUD
2004	Connect two wells to the WTP.	$384,700		DEC/VSW
2004	Indian Housing Block Grant - Comments: NAHASDA administration, operating & construction funds	$138,496	BSRHA	HUD
2003	Village-Sized Wind-Diesel Systems - Comments: OTHER FUNDING: USDOE, ASTF, AVEC, KEA. Development of high penetration system in Wales. Project is designed to develop and test system that will maximize the displacement of diesel fuel by wind energy. Diesel fuel displacement is expected to be 40 to 0% for power production, with excess energy used to provide heat at the school.	$1,437,000	Statewide application	AEA-AEEE
2003	Razorback Water Transmission Line - Comments: OTHER FUNDING: EPA/IG - 2003 - $180,000. Construct 5200' raw water transmission line and well structure.	$240,000		DEC/VSW
2003	Indian Housing Block Grant - Comments: NAHASDA administration, operating & construction funds	$153,264	BSRHA	HUD

Fiscal Year	Project Description/Comments	Total Cost	Contractor	Lead Agency
2003	Sanitation Facilities Improvement Project - Comments: HIS Housing	$97,120		DEC/VSW
2003	CP&I/Street Upgrades - Comments: Capital Matching	$26,316	City of Wales	DCRA
2002	Airport Snow Removal Equipment	$1,269,496	AKDOT/PF	FAA
2002	Rehabilitate Snow Removal Equipment Building	$488,581	AKDOT/PF	FAA
2002	Indian Housing Block Grant - Comments: NAHASDA administration, operating & construction funds	$136,927		HUD
2002	Pumphouse and Watering Point - Comments: IHS $112.9. Two ground water wells were drilled, and test pumped in July 2001. This project will construct a large pump house with a watering point and a small wellhead enclosure over these wells. In addition, a power line to the well site will be installed.	$112,986		ANTHC
2002	Emergency Service Equipment Purchase - Comments: Capital Matching	$18,350	City of Wales	DCRA
2002	Bulk Fuel Business Plan and Conceptual Design - Comments: Other Funding = AVEC $5,000.	$5,250	AVEC	Denali
2001	Road to Tin City, Ph I - Comments: 6.5 mi. to Tin City to access dock & airport.	$9,000,000	Kawerak	BIA
2001	Multi-purpose Community Center - Comments: Norton Sound Fisheries Disaster Multipurpose Community Center	$1,000,000		EDA
2001	CF&E/Dumpsite Improvement -Comments: Capital Matching	$5,658	City of Wales	DCRA
2000	Solid Waste Improvement Plan	$112,986		DEC/VSW
1997	Install 150 KW Windpower Project - Comments: OTHER FUNDING: EPA $289; U.S. Dept. of Energy $132K; Kotzebue and AVEC funds $90K	$688,797	Kotzebue Electric Association	AEA-AEEE

Source: 2011-2016 Wales LEDP

The Native Village of Wales, City of Wales, and the Wales Native Corporation developed the following priority projects in their 2011-2016 LEDP:

1. Bulk fuel
2. New clinic
3. HBH Lagoon/Dumpsite
4. Seawall Lagoon, Boat Harbor and Fishing
5. Cemetery
6. Repair Housing
7. Public Safety
8. Heavy Equipment/Storage
9. Water & Sewer Line
10. Renovate Church
11. Youth Center
12. Long & Short-Term Housing
13. New Power Plant/Wind Solar Energy
14. Gravel Business
15. Grader

16. Snow Fencing
17. Tourism

3.4.10 Subsistence and Food Sovereignty in Rural Alaska

Food security, more specifically, food sovereignty, and climate change are two of Alaska's most daunting challenges. Alaska is warming twice as fast as the global average, which 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 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 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).

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 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).

Climate change in impacting the quality and quantity of many berry species that Alaskans rely on. A shifting climate has led to many changes that could influence berry species, including rising temperatures, longer growing seasons, shorter snow-covered seasons, and altered precipitation patterns. It can also lead to changes in the pollinators that the berry plants depend on, and in the populations of the animals and microbes that consume or protect the plants. The effects of those changes are complicated, and the overall impact can be positive or negative (Mulder et al. 2023).

In Wales, the quantity and quality of berries that the community relies upon for subsistence has been severely impacted by climate change. The Planning Team shared that women in the Village used to pick berries 12+ hours a day and now, berries do not grow where they used to. They are having to go to higher elevations and further away from the Village to find berries. They also shared that that they used to be able to go on long hunting trips (~4 days at a time), now the weather has changed so much, they are lucky to get 1-2 good days in a row.

In order to increase food sovereignty in Wales, the Planning Team plans to apply for funding for a community garden or greenhouses, drying racks, or other resources to allow the community to grow their own food.

4. MITIGATION STRATEGY

This section outlines the process for preparing a mitigation strategy. The mitigation strategy provides the blueprint for the implementation of desired activities which will enable the community to continue to save lives and preserve infrastructure by systematically reducing hazard impacts, damages, and community disruption.

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

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)))
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))
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.7(c)(3)(i))
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))
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))
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))
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)

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))
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?
C1-b. Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?
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))
C2-a. Does the plan contain a narrative description or a table/list of their participation activities?
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.6(c)(3)(i))
C3-a. Does the plan include goals to reduce the risk from the hazards identified in the plan?
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))
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?

Regulation Checklist- 44 CFR § 201.6 Local Mitigation Plans
ELEMENT C. Mitigation Strategy
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?
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))
C5-a. Does the plan describe the criteria used for prioritizing actions?
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 2022 (Local)

4.1 CAPABILITY ASSESSMENT

The Native Village and City of Wales' existing authorities, policies, programs, and resources available for hazard mitigation are described in the tables below.

Table 24 and Table 25 describes the Native Village and City of Wales' capabilities available for hazard mitigation.

Table 24- Native Village of Wales Capability Assessment

Capability/Tool	Existing Yes/No?	Comments (Year of most recent update; problems administering it, etc.)
Planning and Regulatory		
Comprehensive/Master Plan	No	
Capital Improvements Plan	No	
Local Economic Development Plan (LEDP)	Yes	2011-2016. Yes, the LEDP discusses hazards. The Plan could be used to implement mitigation actions, but it is expired. Wales is currently updating their LEDP.
Emergency Operations Plan	Yes	Wales has a SCERP. Evacuation routes include the road to Tin City
Long Range Transportation Plan	Yes	A Long Range Transportation Plan is currently being finalized with support from Kawerak Transportation.
Housing Plan	No	All housing plans are developed by BSRHA.
Zoning ordinances	No	
Subdivision ordinances or regulations	No	
Building codes	No	
Land use ordinance	No	
Special purpose ordinances	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	

Capability/Tool	Existing Yes/No?	Comments (Year of most recent update; problems administering it, etc.)
Administrative and Technical		
Tribal Council/governing body	Yes	
Tribal Executive	Yes	
Mitigation Planning Committee	Not a formal committee	
Business Committee	No	
Mutual Aid agreements	No	
Code inspector	No	
Environmental/natural resources specialist	No	Kawerak provides support through their Natural Resources program
Emergency Manager	Yes	City Mayor, City Administrator, Tribal President, or Tribal Administrator, as applicable. Kawerak Emergency Preparedness Specialist.
Community Planner	No	Kawerak provides support through their Community and Planning Development department
Housing Specialist	Yes	BSRHA
Engineer	No	Utilizes ANTHC and other agencies for support
Historical/cultural advisor	No	Kawerak provides support through their Cultural and Regional Development department
Financial or grants specialist	Yes	Utilities resources within Kawerak
Administrative staff person	No	
Other (biologist, public health specialist)	No	Kawerak provides multiple programs to support the community
Warning system/services	No	
Hazard data and information	Yes	This HMP
Grant writer	Yes	Utilities resources within Kawerak
GIS	No	Contracted as part of projects
Financial		
Capital improvements project funding	Yes	Can exercise this authority with voter approval
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, etc.)	Yes	
Contract services	No	
Education and Outreach		
Gatherings, festivals, celebrations and/or meetings	Yes	
Natural disaster or safety- related school programs	Yes	
Fire safety programs	No	

Capability/Tool	Existing Yes/No?	Comments (Year of most recent update; problems administering it, etc.)
Social media	Yes	The Tribe and City utilize social media (Facebook) to share information to residents and alert of incoming severe weather or other hazards (polar bear sightings). Information on community gatherings is also shared thorough Facebook.

Table 25- City of Wales Capability Assessment

Capability/Tool	Existing Yes/No?	Comments (Year of most recent update; problems administering it, etc.)
Plans		
Capital Improvements Plan	No	
Climate Change Adaptation Plan	No	
Community Wildfire Protection Plan	No	
Comprehensive/Master Plan	No	
Continuity of Operations Plan	No	
Economic Development Plan	Yes	2011-2016. Yes, the LEDP discusses hazards. The Plan could be used to implement mitigation actions, but it is expired and is in need of an update
Land Use Plan	No	
Local Emergency Operations Plan	Yes	SCERP
Stormwater Management Plan	No	
Transportation Plan	Yes	A current Long Range Transportation Plan is currently being finalized with support from Kawerak Transportation.
Land Use and Planning 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	Contractors as needed
Community Planner	No	Contractors as needed
Emergency Manager	Yes	City Mayor, City Administrator, Tribal President, or Tribal Administrator, as applicable

Capability/Tool	Existing Yes/No?	Comments (Year of most recent update; problems administering it, etc.)
Floodplain Administrator	No	
GIS Coordinator	No	
Planning Commission	No	
Technical		
Grant writing	No	Wales utilizes resources within Kawerak, as needed
Hazard data and information	Yes	This HMP
GIS analysis	No	Contractors as needed
Mutual aid agreements	No	
Funding Resources		
Capital improvements project funding	Yes	Can exercise this authority with voter approval
Community Development Block Grant	Yes	Receives grants from HUD's CDBG program
Federal funding programs (non-FEMA)	Yes	Receives grants from BIA, HUD, BSRHA, EPA, and other federal agencies
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
State funding programs	No	
Stormwater utility fee	No	
Community Programs/Organizations		
Community newsletters	Yes	The City will post information flyers in the community as needed. Multiple selected and prioritized mitigation actions are to increase public awareness of hazards in the community.
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Yes	
Local news	Yes	A large portion of residents and Tribal members utilize the community Facebook page to share news
Organizations that represent/ advocate for/interact with underserved and vulnerable communities/populations	Yes	
Social media	Yes	A large portion of residents and Tribal members utilize the community Facebook page to share news

A list of federal agency programs available for implementing mitigation projects are listed in Appendix A.

The Native Village and City of Wales considers the following as opportunities associated with their existing capabilities:

- Changes in administration and staffing provide diverse experience to support the community.
- Cooperation between the Tri-Entities (Tribe, City, Corporation) allow for progress on important projects in the community.

Challenges of existing capabilities include:

- Changes in administration and staffing can slow down progress towards projects important to the community due to lack of historic context.
- Limited number of staff makes employees wear multiple hats and can be spread too thin.

4.1.1 ABILITY TO EXPAND AND IMPROVE RESOURCES

The Native Village and City of Wales are continuously improving and expanding their technical and human resources through participation in this MJHMP; training; and hiring subject matter expertise as needed. Specific areas that the Planning Team have identified to expand and improve resources include:

- Pursue funding for development and update of existing community plans (land use plan, comprehensive plan, economic development plan, transportation plan, etc.)
- Hire a Tribal or City grant writer
- Development of ordinances and processes to protect residences and critical infrastructure from hazards
- Regularly reviewing and updating their SCERP

4.2 NFIP PARTICIPATION AND REPETITIVE LOSS

The function of the National Flood Insurance Program (NFIP) is to provide flood insurance at a reasonable cost to homes and businesses located in floodplains. In trade, the participating community regulates new development and substantial improvement to existing structures in the floodplain or requires developers to build safely above flood heights to reduce future damage to new construction. The program is based upon mapping areas of flood risk and requiring local implementation to reduce flood damage primarily through requiring the elevation of structures above the base (100-year, or 1% chance) flood elevations.

The Native Village of Wales and the City of Wales **do not** participate in the NFIP, meaning there are no structures insured with federally backed flood insurance policies through the NFIP. Consequently, there are no structures that can be listed as repetitively damaged in the community.

No structures in the community meet the requirements for repetitive damage, as they have never participated in the NFIP to enable the purchase of NFIP insurance policies to track repetitive loss. Buildings in the community may have private insurance policies to mitigate the cost of damages due to flooding or other disasters. However, this data would not be tracked for repetitive loss or mitigation efforts.

4.3 MITIGATION GOALS

The Planning Team developed their mitigation goals and potential mitigation actions to address current and future potential hazard impacts for the residents of Wales and its critical facilities and infrastructure.

Mitigation goals are general guidelines that describe what a community wants to achieve in terms of hazard mitigation and loss prevention from future events. Community-wide visions are made into goal statements, which are typically long-range, policy-oriented statements. The Planning Team developed various mitigation goals and potential mitigation actions to address identified potential hazard impacts for Wales. The results from the exposure analysis were used as a basis for updating the mitigation goals and actions.

Additionally, actions that are classified as Multi-Hazard (MH) seek to mitigate multiple hazards at once and align with the overarching goals listed in the Executive Summary.

1. Minimize loss of life and property from natural hazard events
2. Increase public awareness of risk from natural disasters
3. Protect public health and safety
4. Promote rapid hazard disaster recovery

The hazards of greatest concern to the Tribe are erosion, flood, and severe weather, specifically high winds. The hazards of greatest concern to the City are erosion and severe weather, specifically winter storms.

Table 26 lists the Native Village and City of Wales' strategic mitigation goals which form the foundation for the following processes and culminate within the Mitigation Action Plan (MAP).

Table 26- Mitigation Goals

ID	Goal Description
MH	Reduce damage and loss possibilities for multiple hazards (MH) at once and align with the overarching goals listed in the Executive Summary.
EQ	Reduce earthquake (EQ) damage and loss possibilities.
SW	Reduce severe weather (SW) damage and loss possibilities.
WF	Reduce wildland fire (WF) damage and loss possibilities.
CS	Reduce changes in the cryosphere (CS) damage and loss possibilities.
UR	Reduce naturally-occurring uranium (UR) damage and loss possibilities.
FLD	Reduce flood (FLD) damage and loss possibilities.
TS	Reduce tsunami (TS) damage and loss possibilities.
ER	Reduce erosion (ER) damage and loss possibilities.
LS	Reduce landslide (LS) damage and loss possibilities.

4.4 MITIGATION ACTIONS

The Planning Team reviewed and selected mitigation projects from a comprehensive list of potential actions identified during this MJHMP process for each hazard type. The Planning Team decided if they wanted to "Select" or "Consider [and remove]" each new project that they reviewed. The Planning Team only selected those actions that they intend to and are capable of implementing during the MJHMPs five-year lifecycle within the MAP.

- **Selected-** proposed new projects that the Planning Team selected to incorporate into the MAP.
- **Considered-** proposed new projects that the Planning Team did not select to incorporate into the MAP.

Mitigation actions were developed through referencing various Tribal and City documents, such as the 2015 City of Wales HMP (not adopted), 2011-2016 Wales Local Economic Development Plan, through suggestions from the public survey and collaborators, and through the findings of the risk assessment and Planning Team meetings.

The Planning Team selected all but four mitigation actions that were proposed by Fairweather Science. Table 27 provides an explanation of why the Planning Team chose not to select these mitigation actions. Selected and prioritized mitigation actions can be found in the MAP, Table 29.

Table 27- Proposed Mitigation Actions Not Selected for Inclusion in the MAP

Action Description	Reason For Not Selecting the Action
Work with KEA to determine if it is feasible to repair the windmills in Wales for electricity generation	The Planning Team states that the existing windmills are in very bad shape and likely not repairable. They would rather pursue other

Action Description	Reason For Not Selecting the Action
	electricity options, such as solar, to reduce potential impacts to birds from the windmills.
Build a new water plant	Wales recently received funding for a new water plant. The facility has been built and is awaiting final inspection before it becomes operational in 2024.
Pursue a new source of gravel for construction projects	The Planning Team states that Wales already has a gravel site with adequate gravel for community needs.
Establish an air quality monitoring system to monitor air quality during wildfire season	Compared to the other hazards identified in this HMP, the Planning Team is not severely concerned about wildland/tundra fire or smoke impacts.
Develop, adopt, and enforce burn ordinances for burn permits, campfire restrictions, and outdoor burning controls to guide burning practices and potentially eliminate human caused wildland fires.	The Planning Team stated that outdoor burns or campfires are not a large concern in Wales. Rather than adopting burn ordinances, the Planning Team decided to mitigate wildfire impacts through educating the public about responsible trash disposal to reduce fuels for fires.

4.5 EVALUATING AND PRIORITIZING MITIGATION ACTIONS

To determine which actions would be included in the MAP, the Planning Team evaluated and prioritized each selected mitigation action. The MAP represents the mitigation projects and programs to be implemented through the cooperation of multiple departments in the Native Village and City of Wales.

To consider the opportunities and constraints of implementing each mitigation action, the Planning Team reviewed the simplified Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) evaluation criteria (Table 28). A qualitative statement is provided regarding the benefits and costs and, where available, the technical feasibility for each action considered for implementation.

Table 28- Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion "It is important to consider…"	Considerations
Social	The public support for the overall mitigation strategy and specific mitigation actions.	Community acceptance Adversely affects population
Technical	If the mitigation action is technically feasible and if it is the whole or partial solution.	Technical feasibility Long-term solutions Secondary impacts
Administrative	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.	Staffing Funding allocation Maintenance/operations
Political	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management.	Political support Local champion Public support
Legal	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations.	Local, state, and federal authority Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit-Cost Analysis.	Benefit/cost of action Contributes to other economic goals Outside funding required FEMA Benefit-Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy community.	Effect on local flora and fauna Consistent with community

Table 28- Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion "It is important to consider…"	Considerations
		environmental goals Consistent with local, state, and federal laws

On June 10, 2024, the Planning Team prioritized 72 natural hazard mitigation actions that were selected to carry forward into the Mitigation Action Plan (MAP).

The Planning Team considered the history, extent, impact, and probability of future events of each hazard to determine the priority for each selected mitigation action. 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 Tribe and City.
- **Medium priority** actions are associated with actions that the Planning Team deemed important to the Tribe and City.
- **Low priority** actions are associated with actions that the Planning Team deemed of less importance to the Tribe and City.

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

4.6 MITIGATION ACTION PLAN (MAP)

The Native Village and City of Wales' MAP depicts how each mitigation action will be implemented and administered by the Planning Team. The MAP details each selected mitigation action, its priorities, the responsible entity, the anticipated implementation timeline, and provides a brief explanation as to how the overall benefit/costs and technical feasibility were taken into consideration.

Table 29- Native Village and City of Wales' Mitigation Action Plan (MAP)

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
MH 1	Hold an annual hazard meeting to provide information to residents about recognizing and mitigating all natural hazards that affect the community.	H	Tribe, City	Tribe, City	Annually	B/C: Sustained mitigation outreach program has minimal cost and will help build and support area-wide capacity. This type of activity enables the public to prepare for, respond to, and recover from disasters. Another benefit is this meeting could complete the annual HMP review questionnaire by reviewing hazard impacts and mitigation project status. TF: This low-cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments.	LEDP, SCERP	x	x	x	x	x	x	x	x	x
MH 2	Identify and pursue funding opportunities to implement mitigation actions and to keep mitigation plan up to date (every 5 years).	H	Tribe, City	Tribe, City, FEMA, BIA, DHS&EM, Kawerak	Annually	B/C: Having an active HMP in place allows the Tribe and City to be eligible for mitigation action funding. This is essential to decrease Wales' vulnerability from natural hazards. TF: This project is technically feasible with Tribal, City, or subcontractor resources.	LEDP, SCERP, LRTP	x	x	x	x	x	x	x	x	x
MH 3	Develop, produce, and distribute information materials concerning mitigation, preparedness, and safety procedures for all identified natural hazards.	H	Tribe, City	Tribe, City, FEMA, BIA, DHS&EM	1-3 years	B/C: This project would provide written materials to residents to educate them on mitigation, preparedness, and safety procedures in the event of a disaster. TF: This low cost project is technically feasible with the purchase/development of the materials. FEMA or other agencies may be able to provide this information with little to no cost to the community.	LEDP, SCERP	x	x	x	x	x	x	x	x	x
MH 4	Review existing Small Community Emergency Response Plan (SCERP) and determine if an update is needed.	H	Tribe, City	Tribe, City, DHS&EM	Annually to Triennially	B/C: The SCERP is a new and exciting approach to emergency management for small communities. The SCERP is a customized flipbook with essential, community-specific information for responding to the first 72 hours of a disaster. Wales has an existing SCERP, and the State requires reviews every 3 years. The Planning Team would prefer to conduct annual reviews due to turnover in the Tribe/City and on the SCERP team. TF: This project is technically feasible with Tribal/City resources and assistance from DHS&EM to update the SCERP.	SCERP	x	x	x	x	x	x	x	x	x
MH 5	Pursue funding for development and update of existing community plans (land use plan, small community emergency response plan, economic development plan, transportation plan, etc.)	H	Tribe, City	Tribe, City, FEMA, BIA, DHS&EM	Annually	B/C: Coordinated planning ensures consistent information and community needs are documented. TF: This is feasible to accomplish with funding and contractor support combined with local planning team involvement.	LEDP, SCERP, LRTP, LUP	x	x	x	x	x	x	x	x	x
MH 6	Pursue funding to develop a Debris Management Plan to identify resources available to support post hazard event debris removal.	H	Tribe, City	Tribe, City, FEMA, BIA, DHS&EM	1-5 years	B/C: Debris management plans are an essential disaster management tool than are focused on coordinated planning that enables effective damage abatement and ensures proper attention is assigned to reduce losses, damage, and materials management. TF: This action is feasible with limited fund expenditures but may require a contractor to develop the plan.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 7	Elevate or relocate structures from hazard prone areas.	H	Tribe, City	Tribe, City, FEMA, BIA	Ongoing	B/C: This project would remove threatened structures from hazard areas, eliminating future damage while keeping land clear for perpetuity. TF: This project is feasible with funding to elevate/relocate structures. Acquiring contractor expertise would be required.	LEDP, LRTP, LUP	x	x	x	x	x	x	x	x	x
MH 8	Install two warning sirens in the community (one in the main village and one in northern area of community) to alert residents of incoming hazards or other events, such as polar bear sightings. Test sirens regularly.	H	Tribe, City	Tribe, City, FEMA, BIA, NOAA	1-5 years	B/C: Installing sirens would ensure that the community is notified in the event of incoming severe weather or other hazards, such as a polar bear in the community. TF: This project is technically feasible with the purchase of the sirens and land to install them. Someone would need to be appointed to regularly test and utilize the sirens as needed.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 9	Identify and inventory subsistence use camp locations and equipment to determine if a community owned (Tribe or City) property and equipment should be purchased or allocated for shared use of community members to reduce food security issues associated with hazard related damages to subsistence use camps	H	Tribe, City	Tribe, City, FEMA, BIA, USDA	1-5 years	B/C: This project would inventory use in specific geographic areas to identify a beneficial area to be shared by community members for subsistence hunting, fishing, and berry picking and proceed to purchase the property for formal ownership by the Tribe or City. Costs would depend on the property value and location. Protection of the assets and equipment would reduce food security issues. TF: This project is feasible with community commitment, but maybe politically difficult to complete.	LEDP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 10	Prohibit construction in identified hazard areas	H	Tribe, City	Tribe, City	Ongoing	B/C: The community has identified major problem areas which are prone to flooding and erosion, and has already begun building new facilities away from the shoreline in higher elevations. Enacting an ordinance or regulation to not build in identified hazard areas would reduce eventual relocation costs and life/property protection. TF: This project is technically feasible but would require an ordinance or regulation to execute. Enforcement may be a challenge.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 11	Continue to pursue funding to maintain the road to Tin City	H	Tribe, City	Tribe, City, FEMA, DOT, Kawerak	Ongoing	B/C: The road to Tin City regularly needs repairs due to erosion and flooding. This is the only road leaving Wales and connects to the nearly abandoned town of Tin City, which serves as a potential shelter location for Wales.	LRTP, LUP	x	x	x	x		x	x	x	x

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
						TF: This project is ongoing, demonstrating its feasibility.										
MH 12	Support and coordinate with Kawerak to collect and maintain database of critical facilities with before and after photos and evaluation post hazard event	H	Tribe, City	Tribe, City, Kawerak, BIA	Ongoing	B/C: After a disaster, FEMA funds become available to repair damaged structures to their pre-disaster condition. There have been instances where an applicant cannot prove that damage occurred as a result of the disaster or due to deferred maintenance/existing condition (FEMA 2020). In attempts to reduce this potential of ineligibility after a disaster, the Planning Team will create a catalog with images of the current "pre-disaster conditions" of Wales' critical facilities. This catalog will be reviewed/updated every year or as conditions change, and following a significant hazard event. TF: In 2023, Kawerak received a grant from DOT to administer Futurity IT's Orion software in the region. This software will catalogue each community's critical facilities and serve as an automated tool for FEMA post-disaster reporting.	SCERP	x	x	x	x		x	x	x	x
MH 13	Inventory/database of elderly and non-mobile residents to assist in evacuation or inclement weather	H	Tribe, City	Tribe, City, Kawerak, FEMA, BIA	Ongoing	B/C: There are many elderly/non-mobile residents in Wales. This project would ensure that they are informed of incoming severe weather/storms and checked on after the event. TF: This project is technically feasible with a staff member in-charge of the notifications. This project is already occurring in Wales, but would formalize the process.	LEDP, SCERP	x	x	x	x		x	x	x	x
MH 14	Continue to expand Starlink as needed to provide communications redundancy	H	Tribe, City	Tribe, City, Kawerak, FEMA, BIA, HUD	Ongoing	B/C: Starlink is an alternative option to internet that has proven to be a reliable alternative in remote Alaska. Adding additional Starlink in Wales would allow for backup communications in the event internet is lost during a storm. TF: This project is technically feasible as many facilities and residents already have Starlink.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 15	Explore local interest in building a seed inventory to increase food sovereignty	H	Tribe, City	Tribe, City, Kawerak, FEMA, BIA, USDA	Ongoing	B/C: This project aims at increasing food sovereignty by creating and inventory of seeds and other subsistence foods in the community that are being impacted by climate change. TF: This product is typically feasible with community support and a location to store the inventory.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 16	Repair or replace leaking fuel storage tanks	H*	Tribe, City	Tribe, City, FEMA, BIA, ANTHC, ADEC	Ongoing	B/C: Leaking fuel storage tanks is an ongoing issue for Wales. The community has difficulties getting diesel fuel due to unreliable storage tanks. TF: This project is technically feasible with funding to repair or purchase new fuel storage tanks.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 17	Pursue funding to relocate the existing landfill away from the airport and close out existing landfill and leach field	H	Tribe, City	Tribe, City, FEMA, BIA, ANTHC, EPA, DOT, ADEC	1-10 years	B/C: The existing landfill is old and too small to meet current community needs. The current fencing is too low, and trash regularly blows out of the landfill and into the community. DOT has also advised that the landfill is too close to the airport and needs to be relocated. TF: This project is technically feasible after determining a suitable location for the new landfill and funding to execute the project. An outside contractor is likely necessary to complete the project. The Tribe would need to reinstate the IGAP program to execute this project.	LEDP, SCERP, LRTP, LUP	x	x	x	x		x	x	x	x
MH 18	Relocate, improve, and expand the cemetery. Record names and re-mark graves	H	Tribe, City	Tribe, City, BIA, Kawerak, Veterans Cemetery Grants, NPS Grants, National Trust for Historic Preservation	Ongoing	B/C: There is one main cemetery in Wales. There are several historical and individual grave sites in and around the village. Over the years there have been issues with exposed coffins, erosion, unmarked graves, and some markers are buried. Residents love their families and want to honor and respect those who have passed on before (2011-2016 LEDP). The main cemetery is too close to the shore. It is full and in need of maintenance or expansion. The cemetery needs to be renovated and maintained or relocated. The other historical and individual grave sites need to be protected or relocated. All graves need to have proper markers. Protecting the cemetery will honor Wales' ancestors and teach the children to have respect. It will also make the community safer and more beautiful (2011-2016 LEDP). TF: This project is technically feasible with community support and a location out of hazard areas. Mapping efforts began in 2011 but the Tribe nor City are able to locate the map.	LEDP, LUP	x	x	x	x		x	x	x	x
MH 19	Work with construction contractors to identify historical campsites and other sacred sites when selecting areas for future development	H	Tribe, City	None needed	Ongoing	B/C: This project aims to reduce disturbance to historical and sacred areas in the community during construction or development. TF: This project is ongoing, demonstrating its feasibility. This could be included as a requirement and future RFPs.	LEDP, LRTP	x	x	x	x		x	x	x	x
MH 20	Repave the airport runway and pursue funding to upgrade the airport to include a crosswind runway	H	Tribe, City	Tribe, City, FEMA, FAA, DOT	1-10 years	B/C: The Wales airport has daily flights (weather permitting) from several regional airlines. Each airline has local agents. Wales depends on its runway for deliveries of freight and mail. Wales depends on the runway as the primary means of access in and out of the community, which can be critical in times when healthcare is needed. The gravel runway is regularly maintained. The length is acceptable for most aircraft currently flying to	LEDP, LRTP, LUP	x	x	x	x		x	x	x	x

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
						Wales. There is no crosswind runway, and flights are canceled due to winds when necessary. The current material on the existing runway has some issues and is eroding faster than expected (2011-2016 LEDP). TF: This project is technically feasible with proper funding and an adequate gravel source. The Tribe has had ongoing discussions with DOT about this project and has written many resolutions to move the project forward.										
MH 21	Work with Kawerak Transportation Program to develop a Long Range Transportation Plan (LRTP)	H	Tribe, City	Tribe, City, Kawerak	Ongoing	B/C: A LRTP is a plan that outlines transportation priorities. The Tribal Safety Management Plan (TSMP) provides goals within the community and its surrounding boundaries, as well as the planning for using funding from Tribal Shares monies allocated by the Federal Highway Administration (FHWA) Tribal Transportation Program (TTP) and other funding to leverage projects as allowed. TF: This project is technically feasible with Kawerak, and the Wales LRTP is currently in final draft form.	LEDP, LRTP	x	x	x	x		x	x	x	x
MH 22	Evaluate current sewage lagoon to determine if the site can be upgraded or if it needs to be closed and a new lagoon constructed	H	Tribe, City	Tribe, City, FEMA, EPA ANTHC, ADEC	1-5 years	B/C: The existing sewage lagoon is in need of upgrades or closed and replaced. TF: This project is technically feasible with proper agency support and funding.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 23	Purchase heavy equipment and storage facility specifically for the landfill to be able to deploy before, during, or after a hazard event	H	Tribe, City	Tribe, City, FEMA, DOT	Ongoing	B/C: The community has existing heavy equipment for projects and the community, but the landfill regularly needs maintenance and cleanup. Dedicated equipment and storage at the landfill would alleviate the sharing of resources. TF: This project is technically feasible with the purchase of equipment and storage facility. The Tribe and City have already purchased a plot of land for the storage facility.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 24	Pursue funding for a seawall to protect the community from future flooding and erosion events	H	Tribe, City	Tribe, City, FEMA, USACE, MARAD	1-10 years	B/C: Wales sits on the shoreline of the Bering Sea and is regularly threatened by flooding and erosion. A seawall would help protect the community from future events, saving lives and protecting infrastructure. TF: This project is technically feasible with funding and agency support. A feasibility study would need to be conducted to determine if a seawall would be an effective protection measure.	LEDP, LUP						x	x	x	
MH 25	Pursue funding to develop a small boat harbor facility to provide protected moorage for boats operating out of Wales	H	Tribe, City	Tribe, City, FEMA, USACE, MARAD	1-10 years	B/C: Wales is a subsistence-dependent community and residents regularly utilize small boats to go fishing and hunting. Currently, small boats are stored on the lagoon or in open water. Building a small boat harbor would allow for safe storage of equipment and protection during storms. TF: This project is technically feasible with funding and agency support. In conjunction with a feasibility study, the Tribe and City would request input from boat owners on the location of the boat harbor.	LEDP, LUP						x	x		
MH 26	Continue working with BSRHA to upgrade and add additional housing in Wales. Research potential mechanisms for personal loans for residents to build their own homes to meet community housing needs	H	Tribe, City	Tribe, City, BIA, FEMA, HUD, BSRHA	Ongoing	B/C: BSRHA is the designated Tribal housing authority in the Bering Straits region that receives federal housing funding on behalf of the Tribes. Allocation of funds is determined on need and regular building rotation. Wales recently received 6 new homes in the Village, but the majority of the existing housing is outdated and not weather resistant. TF: This project is ongoing, demonstrating its feasibility.	LEDP, LUP	x	x	x	x		x	x	x	x
MH 27	Continue working with Kawerak to obtain a VPSO to serve in Wales	H	Tribe, City	Tribe, City, Kawerak, State of Alaska	Ongoing	B/C: The Village Public Safety Officer (VPSO) Division began as a conceptual program in 1979 to address Alaskan rural public safety. VPSOs provide public safety services in rural Alaska by decreasing the response time to emergencies and providing an ongoing proactive public safety presence in rural and remote communities of Alaska. A certified VPSO is a peace officer trained in law enforcement, fire protection, emergency medical assistance, community policing, search and rescue, and crime prevention. The presence of a VPSO in a community can have a positive impact on a community. Wales does not currently have a VPSO. TF: This project is technically feasible with support from Kawerak and willingness from the community.	LEDP, SCERP	x	x	x	x		x	x	x	x
MH 28	Assess current storage buildings to determine if additional storage is needed. If needed, pursue funding to build additional storage facilities to support the community with emergency supplies in the event of a hazard event	H	Tribe, City	Tribe, City, FEMA, Kawerak	Ongoing	B/C: Wales as limited storage options and current storage buildings are full. The Tribe/City will assess current storage and determine if contents can be rearranged/relocated or if additional storage is needed. TF: This project is technically feasible with Tribal/City resources.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 29	Renovate and relocate the church away from hazard areas	M	Tribe, City	Tribe, City, FEMA, BIA	1-5 years	B/C: The church is an important community facility, and it is currently threatened by flooding and erosion and is need of cosmetic and structural repairs. The renovated church will serve as an alternate shelter location. TF: This project is technically feasible with funding for renovation and relocation.	LEDP, SCERP, LUP	x	x	x	x		x	x	x	x
MH 30	Pursue funding to build long and short term housing for stranded visitors traveling to Diomede or Shishmaref	H	Tribe, City	Tribe, City, FEMA, HUD, BSRHA	1-5 years	B/C: Residents/travelers to Diomede and Shishmaref are regularly grounded in Wales due to weather conditions. Diomede has a storage conex at the Wales airport for grocery storage when Diomede residents are stranded in Wales. Housing in Wales is already limited and there are no accommodations for stranded travelers.	LEDP, LUP	x	x	x	x		x	x	x	x

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
						TF: This project is technically feasible with funding for the housing and land to build on.										
MH 31	Purchase generators for the Tribal and City offices to utilize in case of sheltering during hazard events	H	Tribe, City	Tribe, City, FEMA, BIA, Kawerak	1-3 years	B/C: The Tribal and City offices are secondary shelter locations in the event of a hazard event or disaster. These facilities are in need of generators to produce electricity during a power outage. TF: This project is technically feasible with the purchase of the generators.	LEDP, SCERP	x	x	x	x		x	x	x	x
MH 32	Continue to build new developments on higher elevations in the community away from the shoreline	H	Tribe, City	Tribe, City, FEMA, HUD, BSRHA	Ongoing	B/C: The community has begun to build new facilities and homes in a higher elevation away from the shoreline. This reduces the potential costs associated with future elevation or relocation of facilities built in lower elevation. TF: This project is ongoing, demonstrating its feasibility.	LEDP, SCERP, LRTP						x	x	x	
MH 33	Pursue funding to build a new Native store at a higher elevation to promote food sovereignty	H	Tribe, City	Tribe, City, FEMA, BIA, HUD	1-5 years	B/C: The Native store is the only store in the Village for residents to purchase food and other supplies. The store is built in a lower elevation and is susceptible to flooding and erosion impacts. A larger and more structurally sound Native store would ensure that the community has access to food and can stockpile additional supplies to prepare for hazard events. TF: This project is technically feasible with funding for the facility and land acquisition.	LEDP, LUP						x	x	x	
MH 34	Explore the feasibility of installing solar panels in Wales to offset electricity costs	H	Tribe, City	Tribe, City, FEMA,AVEC, ANTHC	1-5 years	B/C: Finding lower-cost alternatives to power generation is a priority for the Planning Team. Historically, KEA had installed windmills in Wales, but they are no longer functional and need to be removed from the Village. Solar panels may be a feasible alternative for power generation. TF: This project is technically feasible with support for a feasibility study and funding to purchase the solar panels.	LEDP, LUP	x	x	x	x		x	x	x	x
MH 35	Work with EPA to reinstate the Indian Environmental General Assistance Program (IGAP) Coordinator position in Wales	H	Tribe, City	Tribe, City, EPA	1-3 years	B/C: In 1992, Congress passed the Indian Environmental General Assistance Program Act. This act authorized EPA to provide General Assistance Program (GAP) grants to federally recognized tribes and tribal consortia for planning, developing, and establishing environmental protection programs in Indian country, and for developing and implementing solid and hazardous waste programs on tribal lands. The goal of GAP is to assist tribes and intertribal consortia in developing the capacity to manage their own environmental protection programs and to develop and implement solid and hazardous waste programs in accordance with the individual tribal needs and applicable federal laws and regulations. TF: Wales has had an IGAP coordinator in the past, but that position is no longer filled period. In order to execute this project, someone in the community would need to be willing to step into the role.	LEDP	x	x	x	x	x	x	x	x	x
MH 36	Investigate historical gas/oil spill at the school to determine if it was properly cleaned up and resultant impacts to clams	H	Tribe, City	Tribe, City, EPA, DEC, USCG	1-5 years	B/C: The Planning Team expressed concerns with the decline of clams that are typically found near Wales. There had been a historical gas and oil spill near the school that resulted in 20,000 gallons of fuel being swept into the ocean. The community was not aware of the spill until they smelled it on the beach. The City is unsure if it was properly cleaned up. TF: This project is technically feasible with support from agencies. The City is currently working with BSSD and the USCG to document the extent of the spill.	LEDP	x	x	x	x		x	x	x	x
MH 37	Build a new community playground away from hazard areas	H	Tribe, City	Tribe, City, FEMA, Kawerak, BIA	1-5 years	B/C: The current playground is near the school and is threatened by flooding, tsunami, and erosion. TF: This project is technically feasible with funding to construct the playground away from hazard areas.	LEDP, LUP						x	x	x	
MH 38	Coordinate with BSSD on flood and erosion vulnerability at the school. Complete retrofits to ensure the school withstands future hazard events as the school is used as the primary shelter for the community	H	Tribe, City	Tribe, City, FEMA, BSSD, HUD	Ongoing	B/C: The school is an important piece of infrastructure in the community and is threatened by flooding, tsunami, and erosion. The school is a community meeting place and the primary community shelter in the event of a hazard event or disaster. This project would be a collaborative effort with BSSD. TF: This project is technically feasible with support from BSSD and funding to complete the retrofitting.	LEDP, LUP						x	x	x	
MH 39	Pursue funding to repair and expand the Village Creek Bridge near the school	H	Tribe, City	Tribe, City, FEMA, BIA, ADOT&PF	1-10 years	B/C: The current bridge near the school is not structurally sound and is a safety hazard to travelers. The Planning Team also expressed concerns with the width of the bridge as two ATVs/snowmachines cannot pass at the same time. When the bridge is repaired, considerations for widening it should be considered. TF: This project is technically feasible with funding for the repairs and expansion of the bridge.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 40	Create requirements that contractors must cleanup after construction and remove construction and hazardous waste after construction is complete	H	Tribe, City	None needed	Ongoing	B/C: The Planning Team has expressed concern over past contractors not properly disposing of construction materials and hazardous waste after the project is complete (see Figure 77 and Figure 78). This no cost project would include this requirement in future RFPs as a requirement of the selected contractor. TF: This project is technically feasible with this requirement included in future RFPs.	LEDP, LRTP	x	x	x	x		x	x	x	x

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
MH 41	Require projects being built in the community have regular meetings with Tribe and City to update on progress (with quarterly reporting) to identify issues and progress (codes, inspections, schedules)	H	Tribe, City	None needed	Ongoing	B/C: The Planning Team has expressed concern over past contractors not regularly communicating with Tribal and City leadership on the status of projects. The Tribal and City leadership would like to take a more active role in the status updates of future projects in the community. This no cost project would include this requirement in future RFPs as a requirement of the selected contractor. TF: This project is technically feasible with this requirement included in future RFPs.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 42	Require new facilities to be built to State Building Code and 3rd party inspectors are included in the project costs	H	Tribe, City	None needed	Ongoing	B/C: While Wales does have building codes, the Planning Team understands the importance of building new facilities up to code to withstand future hazard events. While the City cannot enforce building to code, they can include this in future RFPs for the selected contractor to abide by. TF: This project is technically feasible with this requirement included in future RFPs.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 43	Work with reindeer herders to develop strategies to protect the herd	H	Tribe, City	Tribe, City	Ongoing	B/C: The reindeer are an important asset to the Tribe, and the Planning Team would like to coordinate with reindeer herders in the community to determine how they can support the herders and the reindeer herd. TF: This project is technically feasible with existing Tribal and City resources.	LEDP	x	x	x	x		x	x	x	x
MH 44	Fencing or security protection of cultural/historical site at back of Village	H	Tribe, City	Tribe, City, FEMA, BIA	1-5 years	B/C: A historical site at the back of the Village needs fencing for additional security. TF: This project is technically feasible with funding for the site protection.	LEDP, LUP, LRTP	x	x	x	x		x	x	x	x
MH 45	Pursue funding for community walk-in freezer to support food sovereignty in Wales	H	Tribe, City	Tribe, City, FEMA, BIA, USDA	1-5 years	B/C: In order to increase food sovereignty in Wales, the Planning Team wants to explore purchasing a large walk-in freezer that will hold large amounts of meat and supplies. This would help food sovereignty during hazard events or other times where planes are not able to bring supplies to the Village. TF: This project is technically feasible with funding for the freezer and utilities associated with operating and maintaining it.	LEDP	x	x	x	x		x	x	x	x
MH 46	Pursue SCERP team training - provide EMS & FEMA training resources	H	Tribe, City	Tribe, City, FEMA, BIA, Kawerak, DHS&EM	Ongoing	B/C: The Planning Team recognizes the importance of having properly trained appointees for the execution of the SCERP in the event of an emergency. This project is aimed at providing resources to the SCERP points of contacts. TF: This project is technically feasible with proper training materials and resources.	LEDP, SCERP	x	x	x	x	x	x	x	x	x
MH 47	Begin to collect information on potential whole community relocation	L	Tribe, City	Tribe, City, FEMA, BIA, HUD	Ongoing	B/C: Whole community relocation is a last resort for Wales. The Village holds cultural and sacred significance to community members and their ancestors. The community has already begun to build new infrastructure in higher elevations and away from the shoreline to mitigate future flooding and erosion impacts. While the community's priorities are more aligned with managed retreat and defend in place, the Planning Team wants to start finding information on relocation if and when the time comes. TF: This project is technically feasible as other communities in Alaska have begun the relocation process.	LEDP, LUP, LRTP	x	x	x	x	x	x	x	x	x
EQ 1	Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current State Adopted Building Codes	H	Tribe, City	Tribe, City, FEMA, HUD	Ongoing	B/C: This project would ensure that Wales' critical facilities are prepared for a potential major earthquake and are brought up to code. TF: This project is technically feasible with funding for an inspector and funding to complete retrofitting.	LUP	x								
EQ 2	Install non-structural seismic restraints for large furniture such as bookcases, filing cabinets, heavy televisions, and appliances to prevent toppling damage and resultant injuries to small children, elderly, and pets	L	Tribe, City	Tribe, City, FEMA, HUD	1-3 years	B/C: This lower cost project may help protect Wales residents from injuries during a potential major earthquake. TF: This project is technically feasible with funding for the restraints.	LUP	x								
SW 1	Install window shutters on critical facilities and homes to reduce damage during high wind events and insulate during severe weather events	H*	Tribe, City	Tribe, City, FEMA, HUD, BSRHA	1-3 years	B/C: High winds regularly impact the community and have caused damaged to roofs and blown in doors and windows. The Planning Team states that winds from the south are the most concerning. This project would provide protection to windows on critical facilities and residences. TF: This project is technically feasible with funding for the shutters and support from BSRHA.	LEDP		x							
SW 2	Install additional snow fences in Wales to limit impacts of blowing snow during blizzards and other severe winter weather events by allowing it to catch and collect in specified locations.	H	Tribe, City	Tribe, City, FEMA	1-5 years	B/C: Implementing this mitigation project would allow for better management of snow removal and help prevent disruptions due to heavy buildups of blown snow. TF: This project should be feasible for the community and should not require much expertise beyond some construction knowledge and identifying where the fences would be the most beneficial.	LEDP, LUP		x							
SW 3	Create and install new trail markers to aid travelers during blizzards and other severe weather events. Ensure selected markers do not cause secondary safety hazards to ATVs and snowmachines	H	Tribe, City	Tribe, City, FEMA, BIA, HUD	1-5 years	B/C: Blowing snow and blizzards have created issues for winter travel. Establishing better trail markers may aid winter travelers and reduce injuries. The selected markers should not create secondary safety hazards to ATVs and snowmobiles. TF: This project is technically feasible with funding for the markers.	LEDP, LUP, LRTP		x							

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
SW 4	Ensure homes and facilities have properly secured roofing and insulation to protect from heavy snow, high winds, and extreme cold. If necessary, retrofit buildings to prevent roof collapse from heavy snow buildups.	H	Tribe, City	Tribe, City, FEMA, HUD, BSRHA	Ongoing	B/C: Homes and facilities in Wales are regularly impacted by heaving snow and high winds. Ensuring that roofs are secure, and homes have proper insulation will benefit the community and protect infrastructure. TF: This project is technically feasible with funding. A contractor/building inspector may be required for snow load capacity and insulation installation.	LEDP		x							
SW 5	Educate community members on winter travel safety and proper preparedness	H	Tribe, City	Tribe, City, FEMA	Ongoing	B/C: Winter travel safety is a high priority for the Planning Team. Residents have been seriously injured, killed, and have gone missing due to dangerous travel conditions. Educating the community and youth would hopefully reduce the number of incidents. TF: This project is technically feasible with existing Tribal/City resources.	LEDP, SCERP		x							
SW 6	Evaluate houses in areas with deep snow to retrofit with back door/alternate egress in the event of getting snowed in	H	Tribe, City	Tribe, City, FEMA, BIA, HUD, BSRHA	1-10 years	B/C: During heavy snow events, certain homes regularly get snowed in and residents are unable to exit their home. This project would retrofit affected homes with an alternate exit. TF: This project is technically feasible with funding to evaluate and retrofit homes.	LEDP, LUP		x							
SW 7	Coordinate with BSRHA to not build new housing in heavy snow/drift areas	H	Tribe, City	Tribe, City	Ongoing	B/C: This project is aimed at reducing new development in heavy snow deposit areas. Snow accumulates in portions of the community and residents are frequently snowed in. Coordinating with BSRHA to consider this in future development would reduce this issue. TF: This project is technically feasible with support from BSRHA.	LUP		x							
SW 8	Reimplement travel planning notification form	H	Tribe, City	Tribe, City	Ongoing	B/C: In the past, residents would fill out a "travel planning form" when they were traveling away from the Village. This system would ensure that the Tribe/City would be aware of travel plans in case the traveler did not return on time. If the Tribe/City knew where they were going, they would be able to search for them in a timely manner. TF: This project is technically feasible with existing Tribal and City resources. Community support will be needed to execute this project.	LEDP, SCERP		x							
SW 9	Purchase multiple inReaches/satellite communicating devices for community members to check out during winter travel	H	Tribe, City	Tribe, City, FEMA, BIA	1-3 years	B/C: Many residents do not have Garmin inReaches/satellite communicating devices when they travel out of the Village. This is a safety concern for the Planning Team. The clinic has 1 device for the community to utilize. The Tribe and City want to purchase more devices and allow residents to check them in/out. TF: This project is technically feasible with the purchase of the devices and a system for checking out the devices.	LEDP		x							
TF 1	Educate community members on littering and proper trash/debris removal to reduce fuels for igniting a fire.	H	Tribe, City	Tribe, City	Ongoing	B/C: There are ongoing issues of improper trash disposal and littering in Wales. The trash can blow into the ocean or nearby creeks, and it hurts the beauty of the community. Reindeer and wildlife also eat the litter, which can cause health impacts and reduced food quality for the community. The Planning Team will educate the public on how to dispose of trash and impacts of littering by putting up signs in the community. TF: This project is technically feasible with existing Tribe and City resources.	LEDP			x						
CS 1	Continue using ice monitoring cameras and pursue potential to make data publicly available for residents, visitors, and researchers	H	Tribe, City	Tribe, City, NOAA, UAF, NSF	Ongoing	B/C: From 2006-2011, the Sea Ice Group at the Geophysical Institute at UAF maintained a sea ice webcam in Wales that regularly updated imagery on their website for public use. There are still active webcams in Wales, but the Planning Team is unsure of who is maintaining them and if they are able to publicly access the data. TF: This project is ongoing, demonstrating its feasibility. The owner/operator of the current cameras needs to be determined to see if the data can be made publicly available.	LEDP				x					
CS 2	Educate residents and hunters on sea ice safety during travel and subsistence activities to mitigate dangers of thinning ice cover in the winter	H	Tribe, City	Tribe, City, FEMA, Kawerak	Ongoing	B/C: Thinning sea ice poses a hazard to the safety of subsistence hunters when they travel on the ice. Additionally, uneducated residents and youth could fall through the ice. Flyers hung in the community and in the school could be a potential way to share this information. TF: This project is technically feasible with existing Tribal and City resources.	LEDP				x					
UR 1	Continue to work with NSHC to regularly monitor the quality of water in Wales	H	Tribe, City	Tribe, City, NSHC, DEC	Ongoing	B/C: NSHC regularly tests the quality of drinking water in Wales. This long-term monitoring will allow residents to know what contaminants are present and if special considerations should be made before drinking the water. TF: This project is ongoing, demonstrating its feasibility.	LEDP					x				
UR 2	Explore locations for a new drinking water source and relocate wells	H	Tribe, City	Tribe, City, FEMA, EPA, ANTHC, DEC	1-10 years	B/C: Wales' current drinking water runs through Cape Mountain, and picks up traces of uranium and other contaminants. Finding a new drinking water source may reduce or eliminate certain contaminates. TF: This project is technically feasible with proper agency support	LEDP, LUP					x				
UR 3	Pursue funding to analyze water quality after the use of UV water filters to determine the effectiveness of reducing uranium levels to meet or exceed drinking water quality standards	H	Tribe, City	Tribe, City, FEMA, EPA, ANTHC, DEC	Ongoing	B/C: In 2024, Kawerak received a grant to give each household in Wales a UV/reverse osmosis water purification system. This project would quantify the effectiveness of the filters in reducing uranium concentrations. TF: This project is technically feasible with additional water sampling/testing.	LEDP					x				

Action ID	Action Description	Priority	Responsible Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility	Plan Integration	EQ	SW	TF	CS	UR	FL	TS	ER	LS
UR 4	Educate residents and visitors regarding local water quality issues associated with naturally occurring uranium and methods to reduce uranium levels (what works and what does not work)	H	Tribe, City	Tribe, City, Kawerak	Ongoing	B/C: This project is aimed at educating residents and visitors of the local water quality concerns and actions to take to ensure they are drinking clean water. Informing visitors to bring in plastic water bottles may be a way to educate. Alternatively, spreading factual ways of reducing contaminates in water will help educate residents and visitors (for example, boiling water does not reduce uranium levels). TF: This project is ongoing, demonstrating its feasibility. The Tribe and City will work to post signs in the community and near the groundwater wells.	LEDP					x				
UR 5	Coordinate with BSSD to create a school project for the youth in the community to learn how to locally test/sample water quality	H	Tribe, City	Tribe, City, BSSD	Ongoing	B/C: NSHC and DEC regularly test the drinking water in Wales. This project is aimed at educating the youth in the community on how to sample/test their own water to ensure regular updated information and consistency. TF: This project is technically feasible with support from NSHC/DEC, but specialized laboratory sampling equipment is not accessible in Wales.	LEDP					x				
UR 6	Determine the feasibility of installing UV/reverse osmosis water filters at the groundwater wells	H	Tribe, City	Tribe, City, FEMA, EPA, ANTHC, DEC	1-5 years	B/C: In 2024, Kawerak received a grant to give each household in Wales a UV/reverse osmosis water purification system. The Planning Team has concerns of residents actually using the provided filters. This project would aim to look at the feasibility of installing filters at the groundwater well to ensure that residents are drinking clean, safe water. TF: This project is technically feasible with funding for a feasibility analysis and equipment.	LEDP, LUP					x				
UR 7	Request that visitors and contractors haul out plastic water bottles when they leave the Village to reduce waste in the community	H	Tribe, City	Tribe, City	Ongoing	B/C: Visitors/contractors regularly bring in plastic water bottles into the community, however, the existing landfill is overflowing, and Wales does not have a recycling program. This plastic waste regularly blows out of the landfill, and is harmful to the environment. Requiring visitors/contractors to haul out their plastic will reduce the burden on the community to have to burn the plastic and clean it up in their Village. TF: This project is technically feasible with the inclusion of hauling out waste in future RFPs.	LEDP					x				
FLD 1	Assess critical facility elevation and elevate or relocate any critical facilities to meet the recommended building elevation of 16.0 MSL	H	Tribe, City	Tribe, City, FEMA, HUD	Ongoing	B/C: Based on the 2017 USACE Floodplain Manager's report, the 1974 flood level (14.0 MSL) approximates the 100-year (1% chance) return interval storm. USACE recommended that the minimum building elevation is 16.0 MSL to reduce flood impacts. The community has already begun building new facilities in higher elevations. TF: This project is technically feasible with funding for the elevation assessment and relocation/elevation. Land acquisition may be a challenge.	LEDP, LUP						x			
TS 1	Request tsunami inundation mapping to determine if tsunamis pose a threat to Wales	H	Tribe, City	NOAA, AEC	1-5 years	B/C: Currently, there are no communities along the west coast of Alaska that have formal tsunami inundation mapping. It is believed that the Bering Sea/Norton Sound is too shallow to allow for tsunami propagation. However, paleotsunami studies conducted in this region demonstrate that significant tsunamis have occurred in this region in the past, and, therefore, can occur in the future (Medvedeva et al. 2023). Additionally, traditional knowledge in the region has disproved that tsunamis have not occurred in this region. Having formal tsunami inundation completed will visualize how a tsunami would propagate and impact Wales. TF: This project is technically feasible with assistance from the Alaska Earthquake Center through a NOAA grant. Selected communities are not required to match any grant funds.	LEDP							x		
ER 1	Monitor beach elevation to help identify whether and when infrastructure may become exposed to erosion	H	Tribe, City	Tribe, City, FEMA, NSF, NOAA,DGGS	Ongoing	B/C: The erosion forecast method used by Buzard et al. (2021) could not forecast erosion rates in Wales because the model depends on linear erosion of a clearly identified shoreline. The authors suggested this project to be able to forecast future erosion rates in the community. TF: This project is technically feasible with funding for the monitoring equipment and local training for residents.	LEDP								x	
LS 1	Pursue funding to install landslide monitoring equipment at Razorback Mountain	H	Tribe, City	Tribe, City, FEMA, NSF, NOAA,DGGS	1-5 years	B/C: Currently, there is no method of monitoring slope stability of Razorback Mountain. Installing monitoring equipment could help detect a potential landslide early and give the community warning before the event. TF: This project is technically feasible with funding for the monitoring equipment.	LEDP, LUP									x

Plan Integration: LEDP: Local Economic Development Plan, SCERP: Small Community Emergency Response Plan, LRTP: Long Range Transportation Plan, LUP: Land Use Plan

* Highest priority projects

Photo Credit: Stanley Milligrock

Figure 77- Contractor Supplies Left in Wales

Photo Credit: Stanley Milligrock

Figure 78- Contractor Supplies Left in Wales

4.7 MONITORING AND REVIEWING MITIGATION ACTIONS

Mitigation goals and actions identified in this MJHMP will be monitored during the annual review. This process is described in detail in Section 5.3.

In general, during each annual review, each department or agency currently administering a mitigation project will need to submit required documentation to the MJHMP project manager for review. FEMA provided quarterly reports are most used as they provide information on the status of the mitigation project, detail any changes made to the project, and describe implementation problems and appropriate strategies to overcome them. Other reporting forms that may be used include administration plans or agency-specific reporting tools.

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 updates to this MJHMP occur in an efficient, well-managed, and coordinated manner.

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

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)] 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)

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)) D1-a. Does the plan describe how communities will continue to seek future public participation after the plan has been approved? 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)) 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? 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. 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? 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)) 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? 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? 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 2022 (Local)

5.1 PLANNING TEAM MJHMP MAINTENANCE COMMITMENT

The Native Village and City of Wales are responsible for monitoring, evaluating, and updating the 2023 Multi-Jurisdictional Hazard Mitigation Plan Update in accordance with 44 CFR §201.6 and 44 CFR §201.7. The Native Village and City of Wales are committed to annually reviewing the Plan and Tribe and City staff will work to complete their review responsibilities.

Kawerak, Inc. is a partner to the community and its Emergency Preparedness Department is focused on supporting the regional Villages emergency preparedness efforts. As part of this support, Kawerak, Inc. provides resources in the form of subject matter expertise and in some cases, grant writing for the regional Villages. While this support does not replace the Village and City's responsibilities in terms of maintaining, reviewing, and updating the plan, it can provide assistance and advice to the Planning Team.

5.2 CONTINUED PUBLIC INVOLVEMENT

The Native Village and City of Wales are dedicated to continued public involvement to update this MJHMP. In order to continue public involvement within the next 5 years, a copy of the 2024 MJHMP will remain available at the Tribal and City offices as well as at the State of Alaska Division of Community and Regional Affairs online community planning library, along with contact information for whom to direct comments to. The Planning Team Lead, specifically the Tribal President and City Mayor (or designee), will use the community Facebook page(s) to notify the public of, and seek input on, any changes or updates to the 2024 MJHMP, including the prioritized action plan and the 2029 HMP kickoff.

The Tribe and City will continue public involvement by publishing a survey on their website (similar to the survey used in this MJHMP), after a significant hazard event. This "post-disaster" 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.

5.3 IMPLEMENTING, MONITORING, EVALUATING, AND UPDATING THE MJHMP

This MJHMP was updated as a collaborative effort. To build upon previous hazard mitigation planning efforts and successes, the Native Village and City of Wales will continue to use the Planning Team to monitor, evaluate, and update the MJHMP. Each authority identified in the Mitigation Action Plan (MAP) (Table 29) will be responsible for implementing the Mitigation Action Plan and determining whether their respective actions were implemented effectively. The primary point of contact will be the hazard mitigation Planning Team leader (Tribal President, or designee). The Planning Team leader will coordinate local efforts to monitor, evaluate, revise, and document the MJHMP actions' status.

The Native Village and City of Wales will review their successes in achieving the MJHMP's mitigation goals and implementing the Mitigation Action Plan's activities and projects during the annual review process.

The Annual Review Checklist below provides the basis for future MJHMP evaluations by guiding the Planning Team with identifying more or new threatening hazards, adjusting to changes to, or increases in, resource allocations, and garnering additional support for MJHMP implementation.

To ensure that all data is assembled for discussion with the Planning Team, the Planning Team leader will initiate the annual review two months prior to the scheduled planning meeting date. The findings from these reviews will be presented at the annual Planning Team meeting. Each review, as shown on the Annual Review Worksheet, will include an evaluation of the following:

- Determine Tribal and City authorities, outside agencies, collaborators, and resident's participation in MJHMP implementation success.
- Identify risk changes for each identified and newly considered hazards.
- Consider land development activities and related programs' impacts on hazard mitigation.
- Mitigation Action Plan implementation progress.
- Evaluate MJHMP local resource implementation.

Recognizing that this is a living document, the Planning Team will make changes to the MJHMP after each annual revision or a disaster, as conditions warrant. These revisions will also reflect changes to priorities and funding strategies that may have been implemented.

A full update of the Plan will commence a year in advance of the current Plan expiration date in order to ensure the Tribe and City always have an approved Plan and are eligible for federal funding. The update will be completed every five years. The Planning Team will involve the public in the Plan update process by holding an advertised annual public meeting to present recommended revisions and solicit input. Like this plan the updated MJHMP will also be sent to collaborators and neighboring communities for comment.

All future meetings will again be open to the public and it is the hope of the Planning Team that once the public education and outreach actions begin, public involvement in the Plan will increase and will be reflected in future revisions. The Planning Team will involve the public in the annual meeting by posting the notification on social media and flyers throughout the community.

Figure 79 provides a visual of the HMP activities per year.

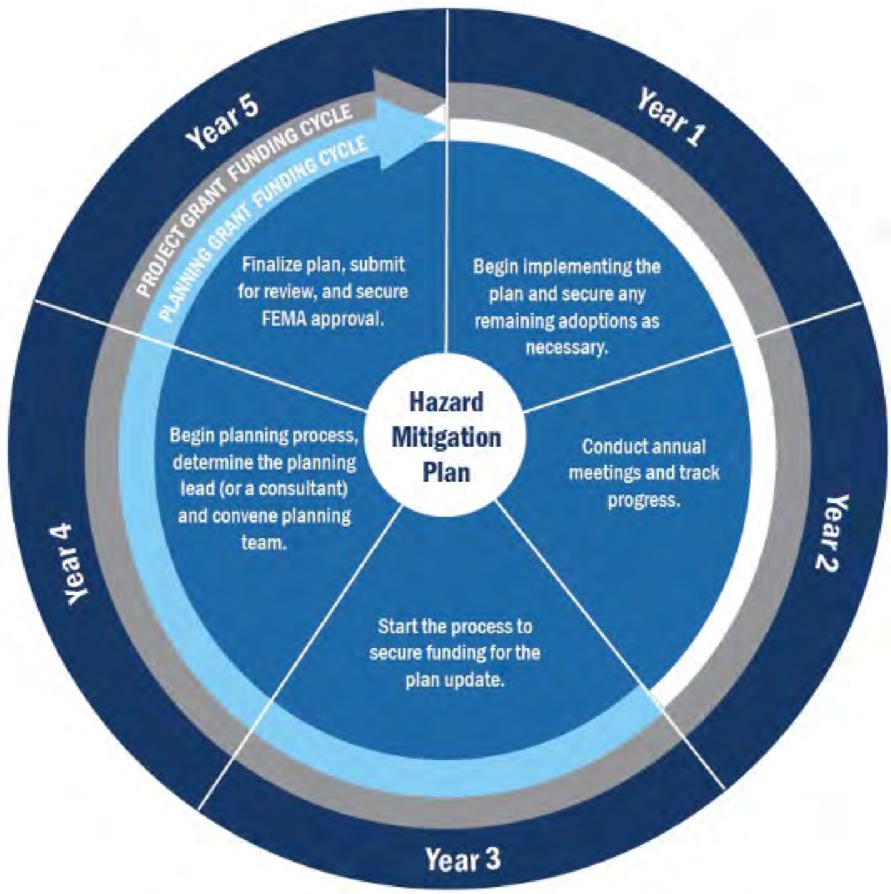


Figure 79- HMP Update Schedule

The Planning Team will schedule a review of the MJHMP Annual Review Checklist and status of mitigation actions in January of every year AND after elections or administration changes to bring new administration team members up to speed on the MJHMP. The Planning Team Leader will be responsible for scheduling the annual review, and to transition responsibilities and information to new Planning Team Leaders and Members.

The Planning Team will review the Annual Checklist also for plan effectiveness. The team will evaluate if the review of the checklist is providing useful information for the update; progress on mitigation actions; identification of new "wish list" actions; and if the plan is working as intended.

Table 30 below contains an annual review checklist to monitor successes and failures of the MJHMP.

Table 30- Annual Review Checklist

Monitoring	Evaluating	Updating	Action	2025	2026	2027	2028	2029
x		x	Disaster/significant hazard events • Injuries/fatalities • Any new data collected?					
x		x	Mitigation projects completed • Final project cost • Hazards mitigated • Lessons learned (success, benefits, outcomes)					
x		x	New infrastructure or critical facilities (and removed/replaced)					
x		x	New hazards, mapping, engineering, or planning documents to include in next update					
x			Community events where hazards or mitigation was discussed (identify upcoming events to discuss)					
x		x	New Planning Team/Collaborator members					
x		x	New land use development					
	x		Has the Plan increased public awareness/ education? If no, provide why, and ideas for improvement					
	x		Has the Plan resulted in a reduction in hazard damage? If no, provide why, and ideas for improvement					
	x		Are the identified mitigation actions being implemented in the designated time frames, and staying within the cost estimate? If no, provide why, and ideas for improvement					
	x		Has the jurisdiction applied for any grants to implement the mitigation strategy?					
	x		New mitigation projects "wishlist"					
		x	Apply for grant funding to update MJHMP (24 months from expiration)			**X**		
		x	Update MJHMP (start 12 months from expiration)				**X**	

5.4 PLAN INTEGRATION

This section describes the requirements for coordinating, implementing, or integrating the MJHMP into Tribal and City planning mechanisms.

After the MJHMP is adopted and implemented, members of the Planning Team will ensure that the MJHMP is integrated into updated and new Tribal and City planning mechanisms. These mechanisms may include their Land Use Plan, SCERP, LRTP, LEDP, where appropriate. Integrating and implementing this philosophy and activities may require updating or amending specific planning mechanisms.

The Planning Team will achieve mitigation action and initiative integration by undertaking the following activities:

MJHMP Section	Existing Plan/ Policy/Program	Process for Integration
Section 3- Risk Assessment	Land Use Plan (LUP)	Incorporate hazard areas into the development of a Land Use Plan to restrict future development in hazard areas as well as strategic community planning for relocation out of hazard areas.
	Small Community Emergency Response Plan (SCERP)	Incorporate risk assessment findings into the future update of the SCERP to help identify and ensure critical resources to maintain operations internally and externally during and after a hazard event.
Section 4- Mitigation Strategy	Long Range Transportation Plan (LRTP)	Incorporate the mitigation actions provided in Table 29 into an updated LRTP by further studying and evaluating the underlying problems or if studies exist that outline potential solutions.
General	Local Economic Development Plan (LEDP)	Integrate all aspects of the HMP into an updated community LEDP to ensure continuity of community goals and objectives.

Specific integration strategies for each mitigation action are noted in Table 29.

As this is the first edition of a HMP for the Native Village and City of Wales, there are no previous Tribal/City plans or planning mechanisms that the HMP could have been integrated into.

6. PLAN UPDATE

This section provides an explanation of how the Planning Team intends to organize their efforts to ensure that updates to the 2024 MJHMP occur in an efficient, well-managed, and coordinated manner.

This section addresses Element D of the Tribal Mitigation Plans regulation checklist and Element E of the Local Mitigation Plans regulation checklist.

Regulation Checklist- 44 CFR § 201.7 Tribal Mitigation Plans
ELEMENT D. Plan Updates
D1. Was the plan revised to reflect changes in development? (Requirement 44 CFR § 201.7(d)(3))
D2. Was the plan revised to reflect progress in tribal mitigation efforts? (Requirement 44 CFR § 201.7(d)(3) and 201.7(c)(4)(iii)))
D3. Was the plan revised to reflect changes in priorities? (Requirement 44 CFR § 201.7(d)(3))
Source: FEMA 2017 (Tribal)

Regulation Checklist- 44 CFR § 201.6 Local Mitigation Plans
ELEMENT E. Plan Update
E1. Was the plan revised to reflect changes in development? (Requirement 44 CFR § 201.6(d)(3))
E1-a. Does the plan describe the changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved?
E2. Was the plan revised to reflect changes in priorities and progress in local mitigation efforts? (Requirement 44 CFR § 201.6(d)(3))
E2-a. Does the plan describe how it was revised due to changes in community priorities?
E2-b. Does the plan include a status update for all mitigation actions identified in the previous mitigation plan?
E2-c. Does the plan describe how jurisdictions integrated the mitigation plan, when appropriate, into other planning mechanisms?
Source: FEMA 2022 (Local)

6.1 CHANGES IN DEVELOPMENT IN HAZARD-PRONE AREAS

This is the first edition of a HMP for the Native Village and City of Wales, and thus, there is not a previous plan to compare changes in development in hazard prone areas or a change in vulnerability to natural hazards.

6.2 CHANGES IN PRIORITIES IN MITIGATION EFFORTS

This is the first edition of a HMP for the Native Village and City of Wales, and thus, there is not a previous plan to compare changes in mitigation efforts.

Current mitigation efforts are focused on building new infrastructure in higher elevation away from flood/erosion areas, and community outreach and education on hazards. The highest priority project for the Planning Team is to get funding to install hurricane shutters on the windows of critical facilities and homes to reduce impacts from high wind events.

7. PLAN ADOPTION

This section fulfills the Native Village and City of Wales' formal MJHMP adoption requirements.

This section addresses Element E of the Tribal Mitigation Plans regulation checklist and Element F of the Local Mitigation Plans regulation checklist.

Regulation Checklist- 44 CFR § 201.7 Tribal Mitigation Plans
ELEMENT E. Assurances and Plan Adoption
E1. Does the plan include assurances that the tribal government will comply with all 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? [44 CFR § 201.7(c)(6)] E2. Does the plan include documentation that it has been formally adopted by the governing body of the tribal government requesting approval? [44 CFR § 201.7(c)(5)]
Source: FEMA 2017 (Tribal)

Regulation Checklist- 44 CFR § 201.6 Local Mitigation Plans
ELEMENT F. Plan Adoption
F1. For single-jurisdictional plans, has the governing body of the jurisdiction formally adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5)) F1-a. Does the participant include documentation of adoption? F2. For multi-jurisdictional plans, has the governing body of each jurisdiction officially adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5)) F2-a. Did each participant adopt the plan and provide documentation of that adoption?
Source: FEMA 2022 (Local)

7.1 TRIBAL ASSURANCES

The Native Village of Wales includes assurances that the Tribe 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.

7.2 FORMAL ADOPTION

The Native Village of Wales formally adopted their 2024 Multi-Jurisdictional Hazard Mitigation Plan Update on date, 2024, and the City of Wales formally adopted their 2024 Multi-Jurisdictional Hazard Mitigation Plan Update on date, 2024.

The MJHMP was submitted to DHS&EM and FEMA for formal approval. A scanned copy of the adoption resolutions is located in Appendix C.

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9. APPENDICES

APPENDIX A – FEDERAL FUNDING RESOURCES FOR MITIGATION PROJECTS

Financial Resource	Accessible or Eligible to Use for Mitigation or Other Activities
FEMA Hazard Mitigation Assistance (HMA) Grants	
FEMA: Building Resilient Infrastructure and Communities (BRIC)-formerly (Pre-Disaster Mitigation (PDM))	BRIC is an annual competitive pass-through grant program that focuses on reducing the nation's risk by funding public infrastructure projects that increase a community's resilience before a disaster affects an area. BRIC was created in 2020 as part of the Disaster Recovery Reform Act of 2018 and replaces FEMA's legacy Pre-Disaster Mitigation grant program. BRIC funds a wide variety of mitigation activities, including microgrids, flood control, wetland restoration, community relocation/buyouts, seismic retrofits, and nature-based solutions. BRIC is available to state and local agencies and federally recognized tribal governments with a FEMA-approved and locally adopted HMP.
FEMA: Hazard Mitigation Grant Program (HMGP)	HMGP is pass-through grant program that supports pre- and post-disaster mitigation plans and projects for state and local agencies and federally recognized Tribal governments. A Presidential Major Disaster Declaration **<u>is required</u>** to authorize HMGP funding.
FEMA: HMGP Post Fire	HMGP–Post-Fire is a pass-through grant program that provides funding for state and local agencies and federally recognized Tribal governments to reduce wildfire risks. Funded projects include (but are not limited to) defensible space initiatives, ignition-resistant construction, hazardous fuels reduction, erosion control measures, slope failure prevention measures, and flash flooding prevention. HMGP–Post-Fire grants are available to eligible states and territories that receive Fire Management Assistance declarations and to federally recognized Tribal governments that have land burned within a designated area. A Post-Fire Presidential Disaster Declaration **<u>is not required</u>** to activate funding.
FEMA: Safeguarding Tomorrow Revolving Loan Fund Program (Safeguarding Tomorrow RLF)	Funding will enable eligible state, local, and tribal jurisdictions to create a revolving loan fund for hazard mitigation projects, cost match, nature-based solutions, upfront project design costs, or for smaller projects that may not qualify for other Hazard Mitigation Assistance Grant Programs.
Other federal mitigation programs	
FEMA: Assistance to Firefighters Grant (AFG) Program	FEMA's AFG Program is a direct annual competitive grant program that focuses on enhancing the safety of the public and firefighters with respect to fire and fire-related hazards. Funding can be used to purchase equipment, protective gear, and emergency vehicles and provide training and other resources related to fire hazards. The AFG Program provides financial assistance directly to eligible fire departments, non-affiliated emergency medical service organizations, and state fire training academies.
United State Fire Administration (USFA) Grants	The purpose of these grants is to assist state, regional, national, or local organizations to address fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors, and firefighters.
Natural Resources Conservation Service (NRCS) Watershed Programs: Emergency Watershed Protection (EWP) Program	The EWP Program offers technical and financial assistance to help relieve imminent threats to life and property caused by floods, fires, windstorms, and other natural disasters that impair a watershed. EWP grants are available to local agencies, conservation districts, federally recognized Tribal governments, and interested public and private landowners that have a sponsor. EWP **<u>does not</u>** require a disaster declaration by the federal or state government.
NRCS Watershed Programs: Watershed Protection and Flood Prevention (WFPO) Program	The WFPO Program provides technical and financial assistance to help plan and implement watershed programs, including flood prevention. It is available to state and local agencies and federally recognized Tribal governments and for watersheds that are 250,000 acres and smaller.

Financial Resource	Accessible or Eligible to Use for Mitigation or Other Activities
Office of Wildland Fire: Burned Area Rehabilitation (BAR) Program	The BAR Program supports efforts to repair or improve burned landscapes unlikely to recover without human assistance. The program, which must be implemented within the first 5 years after a fire, "jump-starts" the landscape recovery process by spreading native plant seeds or planting native seedlings, applying herbicides to kill invasive plants, removing them by hand, or introducing bacteria to control them, and using heavy equipment to disrupt the growth of targeted plant species or contour landscapes to control runoff. This program also funds the repair or replacement of minor infrastructure damaged by a wildfire, such as small trail bridges, handrails, campgrounds, boat ramps, stock tanks, or informational kiosks. Although BAR's scope of work is limited to federally managed lands only, in Alaska approximately 65% of the land is owned and managed by the United States Federal Government as public lands.
United States Department of Housing and Urban Development (HUD): Community Development Block Grant–Disaster Recovery (CDBG-DR)	CDBG-DR grants helps state and local agencies and federally recognized Tribal governments recover from Presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations. CDBG-DR funds a broad range of recovery activities, but each activity must address a direct or indirect impact from the disaster in a most-impacted and distressed area, be a CDBG-eligible activity, and meet a national objective (combating climate crisis and advancing equity). Grantees must ensure that their activities align with the mitigation strategy of their State Hazard Mitigation Plan (SHMP).
HUD: Community Development Block Grant–Mitigation (CDBG-MIT)	CDBG-MIT provides funding for mitigation activities that "increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship, by lessening the impact of future disasters." The CDBG-MIT program is operated under the oversight of DCRA.
HUD: CBGP Entitlement Communities Grants	Property acquisition; relocation and demolition; rehabilitation of residential and nonresidential structures; construction of public facilities and improvements, such as water and sewer facilities, streets, neighborhood centers; and the conversion of school buildings for eligible purposes.
HUD: Recovery Housing Program (RHP)	HUD's RHP program provides funding to provide stable, transitional housing for individuals in recovery from a substance use disorder. The funding covers a period of not more than two years or until the individual secures permanent housing, whichever is earlier.
HUD: Section 108 Loan Guarantee	The Section 108 Loan Guarantee Program (Section 108) provides Community Development Block Grant (CDBG) recipients with the ability to leverage their annual grant allocation to access low-cost, flexible financing for economic development, housing, public facility, and infrastructure projects.
HUD: Indian Housing Block Grant (IHBG) (formula)	The IHBG program allocates formula funding to tribes or tribally designated housing entities for the delivery of a range of affordable housing opportunities and housing-related activities to low and moderate income members of Federally recognized Indian tribes, Alaska Native villages, and native Hawaiians. Each year, IHBG recipients identify and report on IHBG-funded activities using the Indian Housing Plan/Annual Performance Report (HUD-52737). BSRHA receives on behalf of the tribes, but the Tribes have approval authority on the spending.
HUD: Indian Housing Block Grant (IHBG) (competitive)	Under the program, eligible Indian tribes and tribally-designated housing entities (TDHEs) receive grants to carry out a range of affordable housing activities. Grant funds may be used to develop, maintain, and operate affordable housing in safe and healthy environments on Indian reservations and in other Indian areas, and carry out other affordable housing activities. Grant funds must be used to primarily benefit low-income Indian families. Tribes can authorize BSRHA to apply on their behalf for projects.
HUD: Indian Community Development Block Grant (ICDBG)	Provides Indian tribes (and certain Indian organizations applying on behalf of tribes) with direct grants for use in developing viable Indian and Alaska Native Communities, including decent housing, a suitable living environment, and economic opportunities, primarily for low and moderate income persons.

Financial Resource	Accessible or Eligible to Use for Mitigation or Other Activities
HUD: Indian Community Development Block Grant Imminent Threat (ICDBG-IT)	The Secretary of HUD may set aside up to $4 million of each year's allocation for the noncompetitive, first come-first served, funding of grants to eliminate or lessen problems which pose an imminent threat to public health or safety of tribal residents.
HUD: Emergency Safety and Security Grant (ESSG) Program	A "safety and security emergency" is defined as an emergency that may arise from: 1) an immediate need for funding by the PHA to implement safety and security measures necessary to address crime and drug-related activity; or 2) a safety emergency which requires the purchase, repair, replacement, or installation of carbon monoxide alarms/detectors, and or smoke/heat alarms/detectors. The safety and security emergency must occur within the Federal Fiscal Year (October 1 —September 30) in which the funds were appropriated.
HUD: Emergency Solutions Grant Program (ESG)	The ESG Program is designed to assist people with quickly regaining stability in permanent housing after experiencing a housing crisis and/or homelessness.
Denali Commission: Energy Program, Transportation Program, Village Infrastructure Protection Program, Water & Sanitation Program, Broadband, Housing, and Workforce/Economic Development	Grants for tribal, local, state, and federal governments to improve the effectiveness and efficiency of government services, to develop a well-trained labor force employed in a diversified and sustainable economy, and to build and ensure the operation and maintenance of Alaska's basic infrastructure.
DCRA/DCCED: Community Block Development Grant	Competitive grants which provide financial resources to Alaskan communities for public facilities and planning activities which address issues detrimental to the health and safety of local residents and to reduce the costs of essential community services.
DCRA/DCCED: Climate Change Impact Mitigation Program	Provides technical assistance and funding to communities imminently threatened by climate-related natural hazards such as erosion, flooding, storm surge, and thawing permafrost. The intent of the program is to help impacted communities develop a planned approach to shoreline protection, building relocation and/or eventual relocation of the village.
Alaska Energy Authority (AEA): Bulk Fuel Upgrade Program, Diesel Emission Reduction Act Program, Rural Power System Upgrade Program	Provides funding for energy-related upgrades and emissions reduction programs.

APPENDIX B – FEMA REVIEW TOOL, TRIBAL AND LOCAL HAZARD MITIGATION PLANS

APPENDIX C – ADOPTION RESOLUTIONS

APPENDIX D – PUBLIC OUTREACH ACTIVITIES

Survey responses: The public survey was active from March 1, 2024, to XX, 2024. A total of XX responses were received.

Flyer of the availability of the Draft Risk Assessment

Native Village and City of Wales
2024 Hazard Mitigation Plan

WE NEED YOUR INPUT!

The Native Village and City of Wales are working together to develop a Hazard Mitigation Plan (HMP). This HMP will identify the natural hazards that occur in Wales, the critical facilities/infrastructure we rely upon, and which critical facilities/infrastructure are vulnerable to the hazards. Once adopted, both the Tribe and the City will then be eligible for federal mitigation project funding.

The Draft Risk Assessment portion of the HMP is ready for public review and comment. Comments should be sent to the contractor (laura.young@fairweather.com or olivia.kavanaugh@fairweather.com) and the Kawerak Project Manager (kknowlton@kawerak.org) and received by **June 7, 2024** to enable the team to respond and incorporate any changes.

- PUBLIC SURVEY -

The Tribe and the City need your input to ensure the HMP update aligns with community goals related to natural hazards and mitigation. We thank you in advance for your time.

Please fill out the survey here:
https://www.surveymonkey.com/r/Kawerak2024HMPs

Or scan the QR code:

On May 31, 2024, the public was notified of the availability of the Draft Risk Assessment through the Kawerak, Inc. website and email blast.

Posting on the Kawerak, Inc. website:

Wales Hazard Mitigation Plan Seeking Public Comment

May 31st, 2024 | Emergency Planning

The Native Village and City of Wales are presenting the Draft Risk Assessment portion of their 2024 Hazard Mitigation Plan for public review and comment.

They are asking for the public to review the Draft Risk Assessment and provide comments. Comments should be sent to the contractor (laura.young@fairweather.com or olivia.kavanaugh@fairweather.com) and the Kawerak Project Manager (kknowlton@kawerak.org) and received by **June 7, 2024** to enable the team to respond and incorporate any changes.

To learn more about the project please visit the Storymap here: Kawerak, Inc. Tribal Hazard Mitigation Planning Project (arcgis.com).

Download the plan here: https://kawerak.org/download/wales-multi-jurisdictional-hazard-mitigation-plan-2024/?tmstv=1716918832

You can also access the project survey at the link here: Phase 2- Kawerak, Inc. Hazard Mitigation Plan Questionnaire Survey (surveymonkey.com) to provide thoughts on hazards, preparedness, and mitigation projects.

May 31, 2024 Kawerak, Inc. email blast about the Draft Risk Assessment:

Wales Hazard Mitigation Plan Feedback

Kawerak and Fairweather Science are working with the Native Village of Wales and the City of Wales to complete their 5 year Hazard Mitigation Plan. This plan will give the community access to funding for Hazard Mitigation projects and to strengthen the community's resilience in event of an emergency. To learn more about hazard mitigation visit kawerak.org/emergency.

Native Village and City of Wales 2024 Hazard Mitigation Plan

WE NEED YOUR INPUT!

The Native Village and City of Wales are working together to develop a Hazard Mitigation Plan (HMP). This HMP will identify the natural hazards that occur in Wales, the critical facilities/infrastructure we rely upon, and which critical facilities/infrastructure are vulnerable to the hazards. Once adopted, both the Tribe and the City will then be eligible for federal mitigation project funding.

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Flyer of the notice of the public community meeting on June 13, 2024.

Native Village and City of Wales 2024 Hazard Mitigation Plan

WE NEED YOUR INPUT! JOIN US FOR A COMMUNITY MEETING ON JUNE 13, 2024!

The Native Village and City of Wales are working together to develop a Hazard Mitigation Plan (HMP). This HMP will identify the natural hazards that occur in Wales, the critical facilities/infrastructure we rely upon, and which critical facilities/infrastructure are vulnerable to the hazards. Once adopted, both the Tribe and the City will then be eligible for federal mitigation project funding.

Please join us for a community meeting to discuss natural hazards and mitigation projects. The meeting will take place **in person** on **June 13, 2024 at 2pm** at the Tribal office.

If you cannot join in person, click **here** to join the video call

OR

Dial into the meeting: **907-302-3866**

Phone conference ID: **957 306 487#**

- PUBLIC SURVEY -

Please fill out the survey here:

https://www.surveymonkey.com/r/Kawerak2024HMPs

Or scan the QR code: