VIRTUAL FORUM

Climate Displacement Forum

Part 3: Community-wide Protection, Relocation & Expansion

October 22, 2020

Brought to you by:

EcoAdapt™

Welcome!

Housekeeping

- Please mute

- Use the question function

- Session will be recorded and posted on the Climate Adaptation Knowledge Exchange – www.CAKEx.org

- Slides & presenter information are available for download

- Contribute to the Forum resource page

Acknowledgements

Part 3: Community-wide Protection, Relocation & Expansion

Twyla Thurmond, City of Shishmaref

Kelsey Moldenke, Quinault Indian Nation

Sophia Katchatag, Native Village of Shaktoolik

Walter Nelson, City of Napakiak

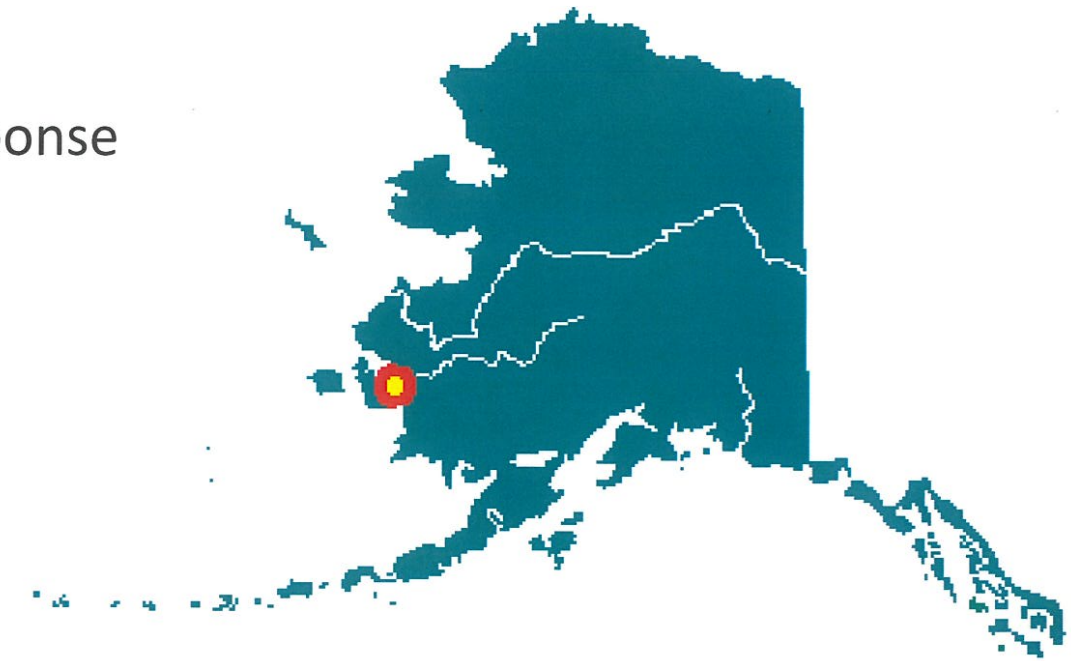
Alessandra Jerolleman, Jacksonville State University

Introduction

Managed Retreat in Napakiak, Alaska

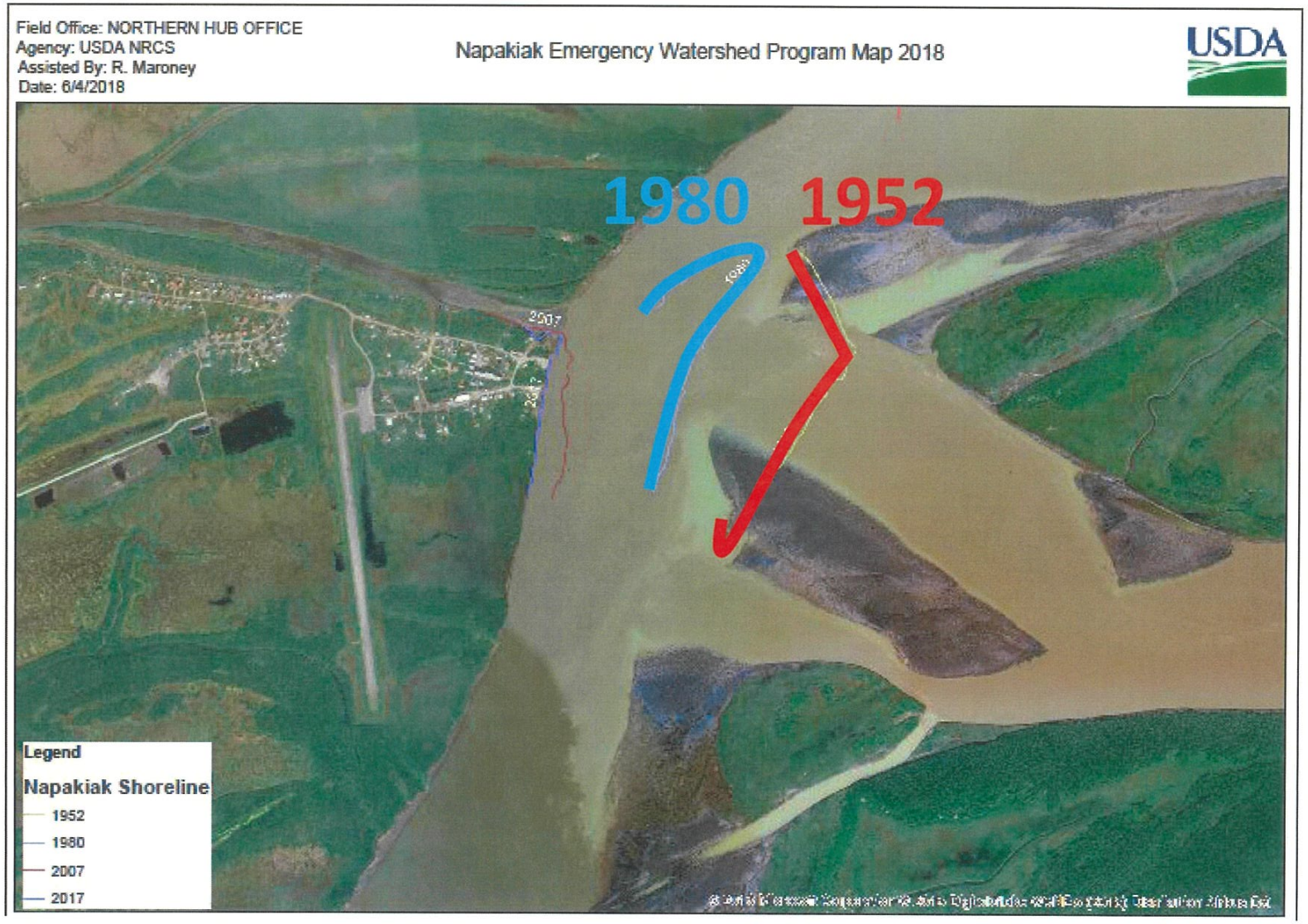
Presentation Outline

- Community overview
- History of erosion response
- Current threat
- Next steps

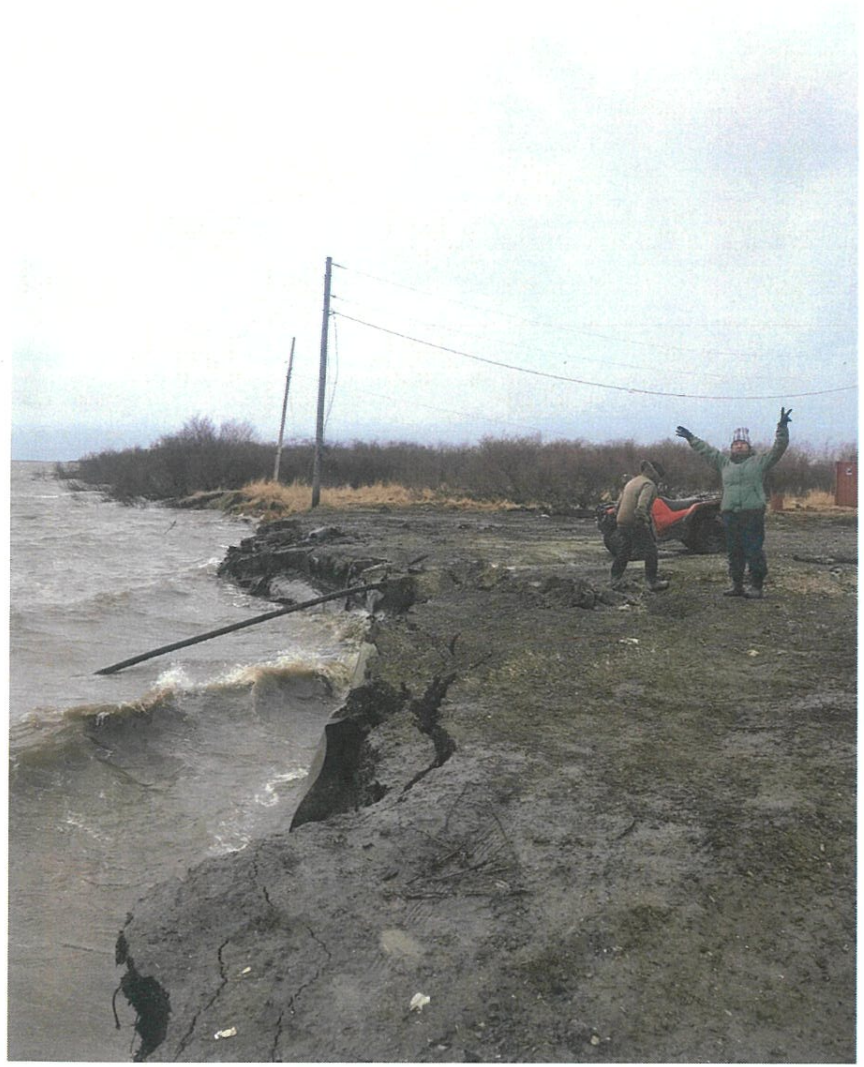


Our Community

History of Erosion Response

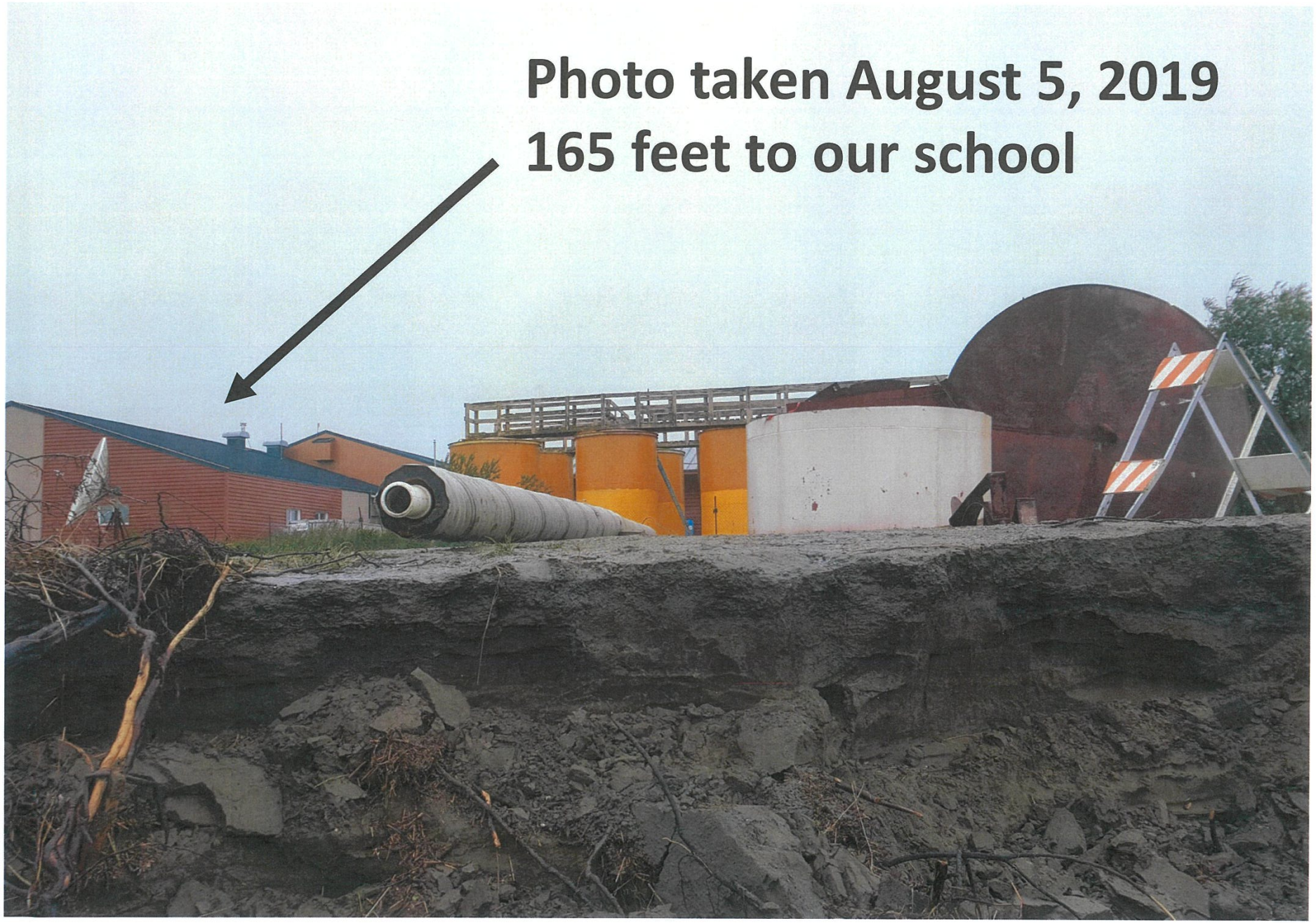


All of the land in this ~1964 image is now gone.
Our community moved all of the buildings.



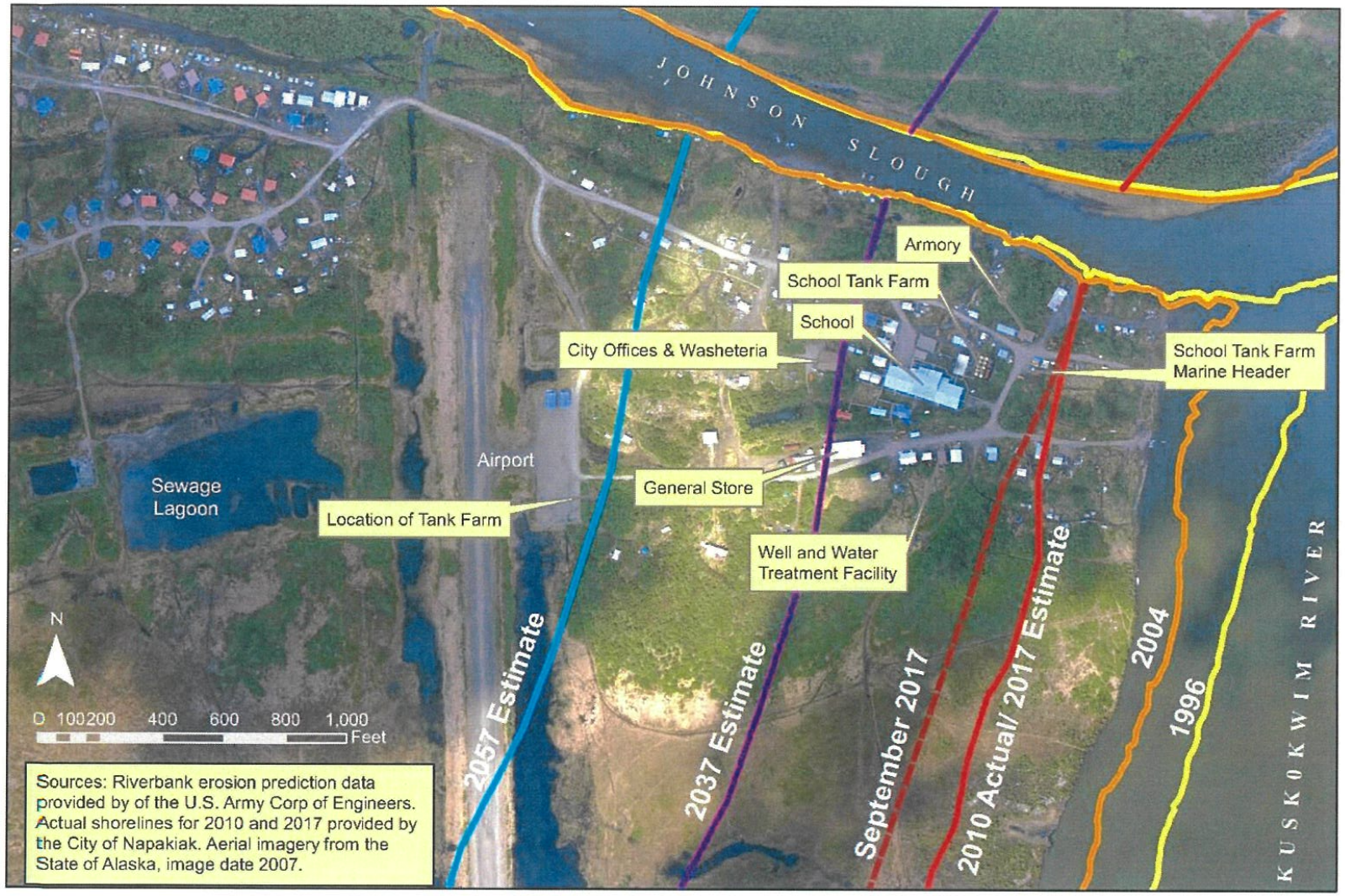
Update: The fuel tank farm has since been relocated to a different site monitored by the Coast Guard.

Current measurement to the fuel tank site is at 16ft after the tanks were moved.



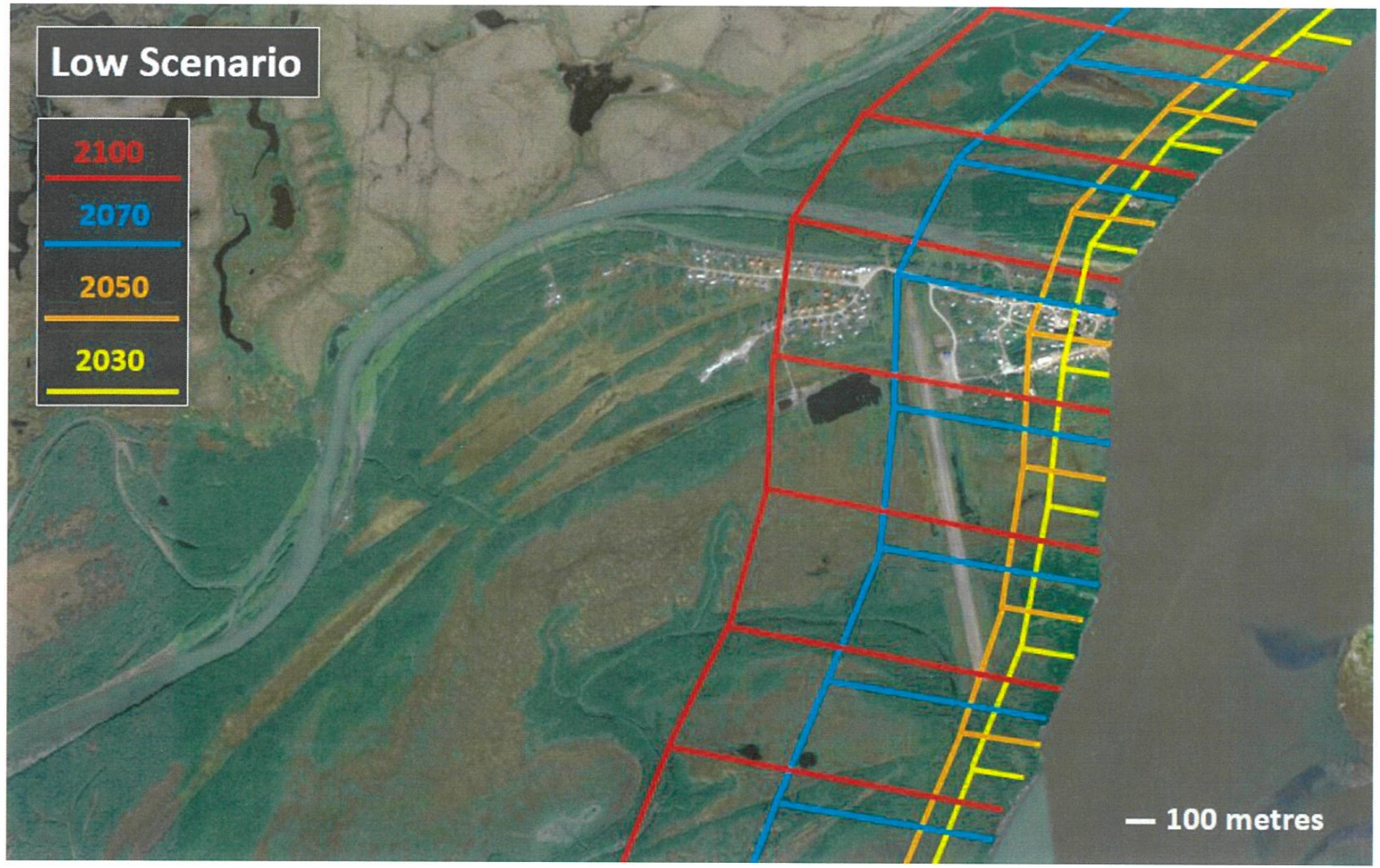
Current measurement as of October 9, 2020 to the school is 97 ft.

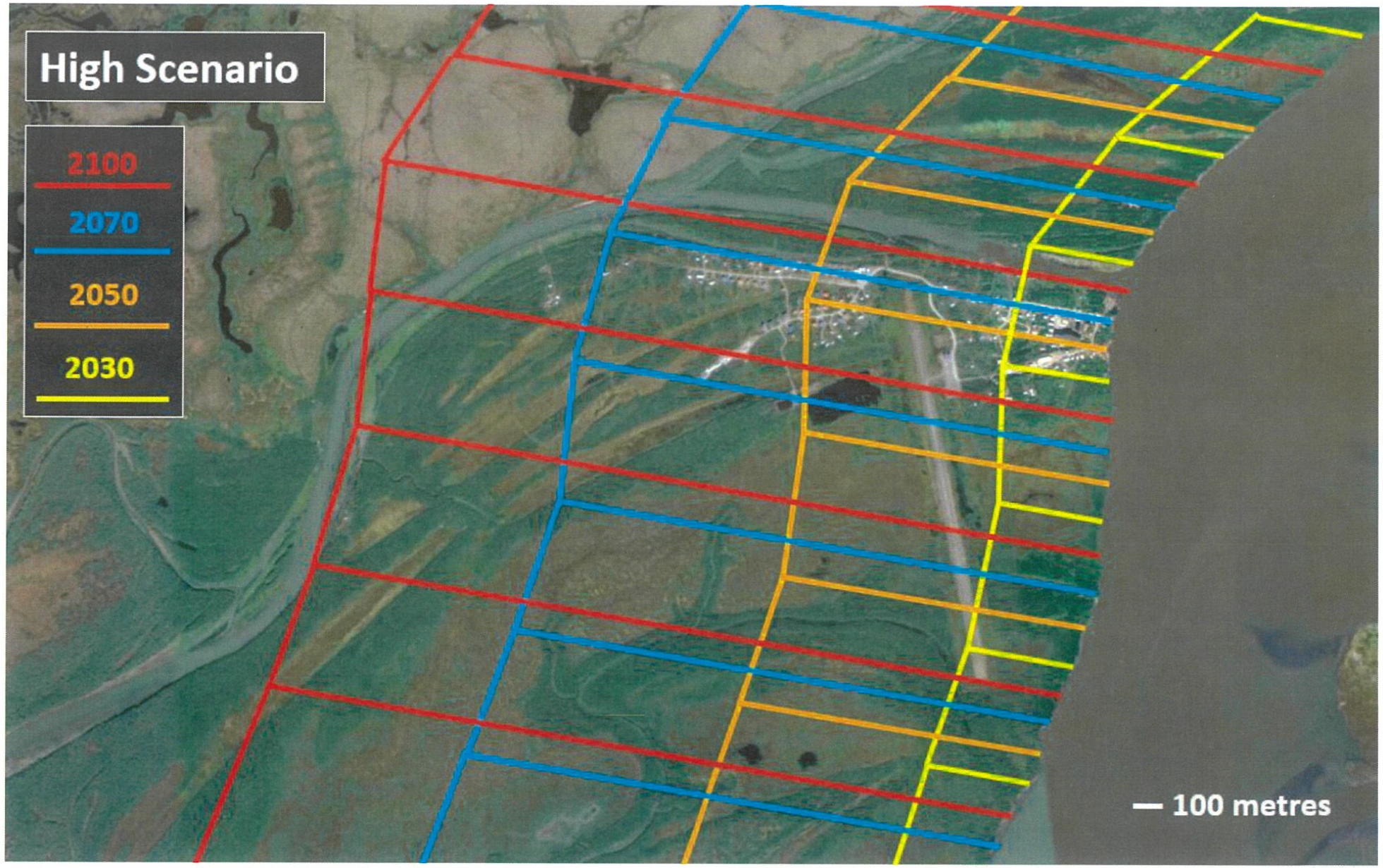
Current Threat



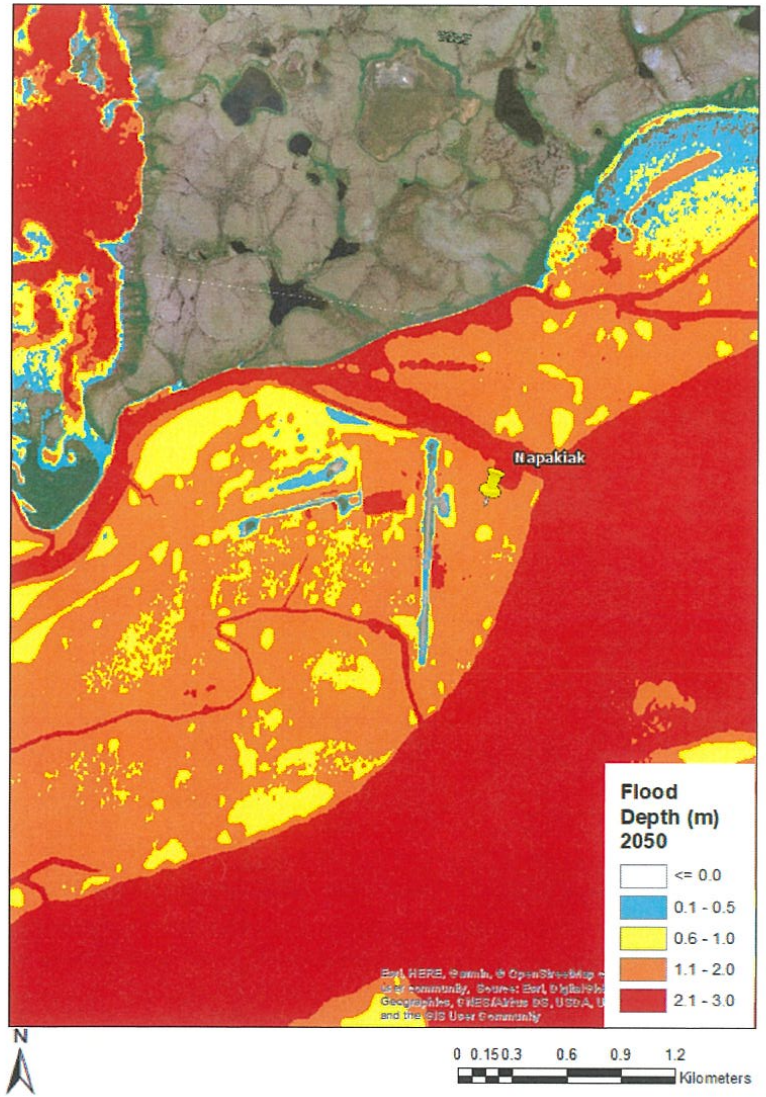
Army Corps of Engineers estimated it would cost $90M to protect against erosion, and would not likely work due to the 50-80 ft river depth and force of river.

Climate Change Modeling Results

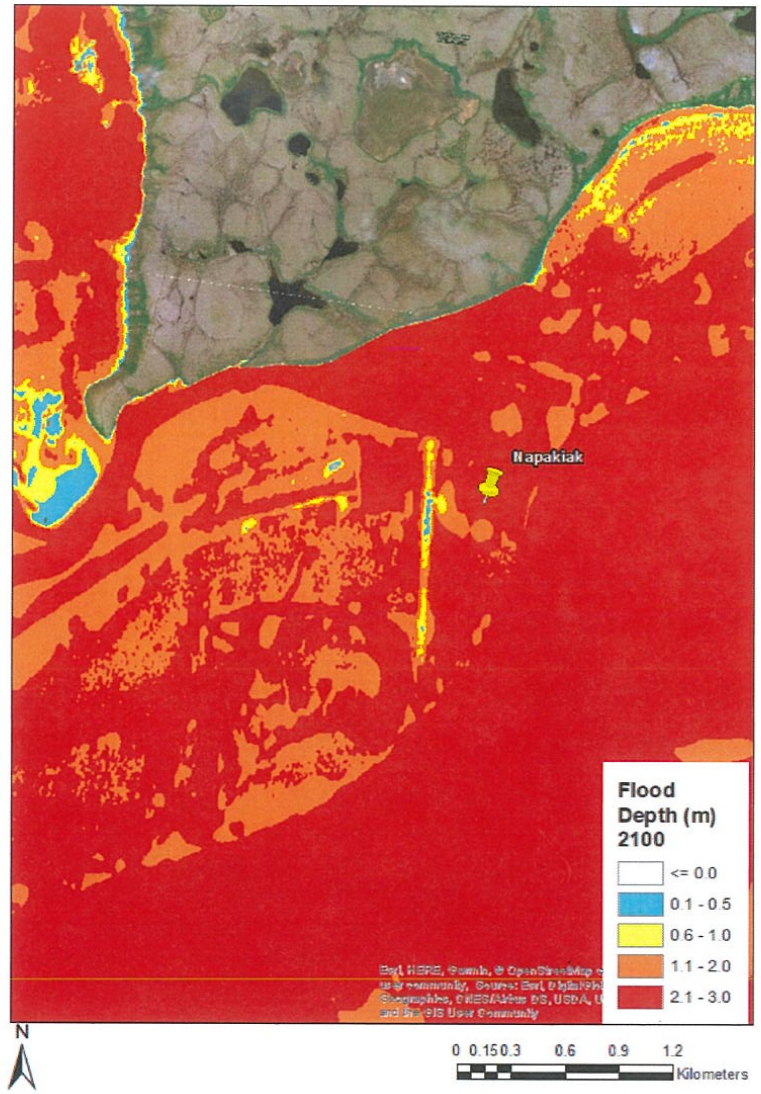



High Scenario
2100
2070
2050
2030
— 100 metres

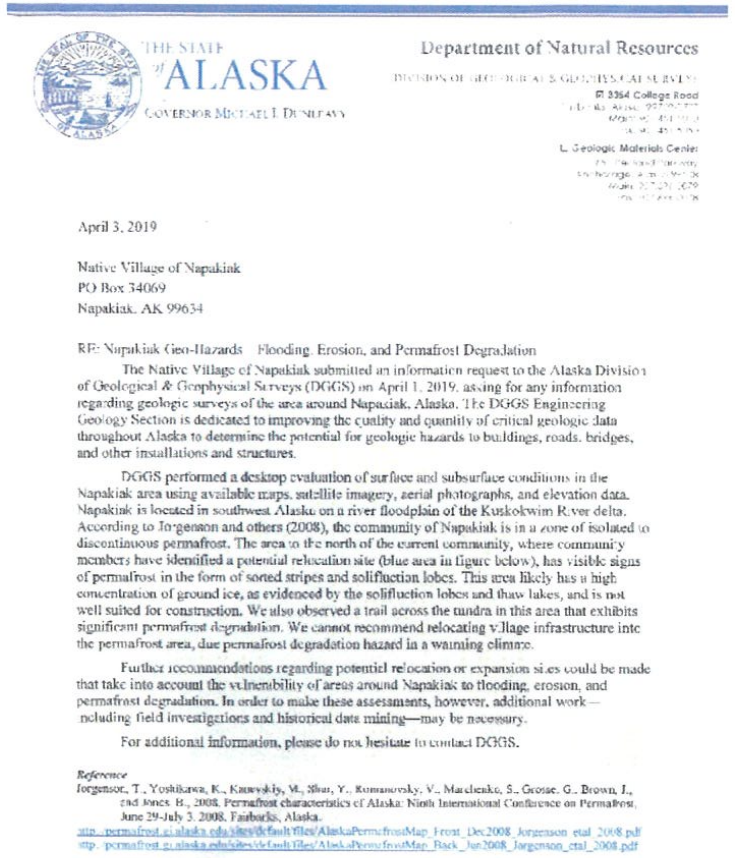
2050 RCP8.5 100 ARI Flood Depth (m) in Napakiak



2100 RCP8.5 100 ARI Flood Depth (m) in Napakiak



Desktop Permafrost Assessment



THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Natural Resources
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
3354 College Road
Fairbanks, Alaska 99709-3707
Main: 451-5010
Fax: 451-5050

Geologic Materials Center
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Anchorage, Alaska 99508
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Fax: [illegible]

April 3, 2019

Native Village of Napakiak
PO Box 34069
Napakiak, AK 99634

RE: Napakiak Geo-Hazards – Flooding, Erosion, and Permafrost Degradation

The Native Village of Napakiak submitted an information request to the Alaska Division of Geological & Geophysical Surveys (DGGS) on April 1, 2019, asking for any information regarding geologic surveys of the area around Napakiak, Alaska. The DGGS Engineering Geology Section is dedicated to improving the quality and quantity of critical geologic data throughout Alaska to determine the potential for geologic hazards to buildings, roads, bridges, and other installations and structures.

DGGS performed a desktop evaluation of surface and subsurface conditions in the Napakiak area using available maps, satellite imagery, aerial photographs, and elevation data. Napakiak is located in southwest Alaska on a river floodplain of the Kuskokwim River delta. According to Jorgenson and others (2008), the community of Napakiak is in a zone of isolated to discontinuous permafrost. The area to the north of the current community, where community members have identified a potential relocation site (blue area in figure below), has visible signs of permafrost in the form of sorted stripes and solifluction lobes. This area likely has a high concentration of ground ice, as evidenced by the solifluction lobes and thaw lakes, and is not well suited for construction. We also observed a trail across the tundra in this area that exhibits significant permafrost degradation. We cannot recommend relocating village infrastructure into the permafrost area, due permafrost degradation hazard in a warming climate.

Further recommendations regarding potential relocation or expansion sites could be made that take into account the vulnerability of areas around Napakiak to flooding, erosion, and permafrost degradation. In order to make these assessments, however, additional work—including field investigations and historical data mining—may be necessary.

For additional information, please do not hesitate to contact DGGS.

Reference

Jorgenson, T., Yoshikawa, K., Kanevskiy, M., Shur, Y., Romanovsky, V., Marchenko, S., Grosse, G., Brown, J., and Jones, B., 2008, Permafrost characteristics of Alaska: Ninth International Conference on Permafrost, June 29-July 3, 2008, Fairbanks, Alaska.
http://permafrost.gi.alaska.edu/sites/default/files/AlaskaPermafrostMap_Front_Dec2008_Jorgenson_etal_2008.pdf
http://permafrost.gi.alaska.edu/sites/default/files/AlaskaPermafrostMap_Back_Jan2008_Jorgenson_etal_2008.pdf

"The area to the north of the current community, where community members have identified a potential relocation site, has visible signs of permafrost in the form of sorted stripes and solifluction lobes. This area likely has a high concentration of ground ice, as evidenced by the solifluction lobes and thaw lakes, and is not well suited for construction…**We cannot recommend relocating village infrastructure into the permafrost area, due permafrost degradation hazard in a warming climate."**

Current Projects

- Relocated city garage and fire station
- Replace boat and hovercraft landing
- Downscaled climate modeling
- Geotechnical evaluation of potential new sites
- Managed retreat planning

Next Steps

- River change study
- Select site for managed retreat
- New site layout
- Design roads, utilities, etc.
- Build roads, utilities, etc.
- Move buildings
- LKSD will provide temporary school facilities and then build a new school (~$36 million)

Contact Us

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Napakiak, AK 99634
PH: (907) 589-2611

COMMUNITY WIDE PROTECTION, RELOCATION AND EXPANSION

SOPHIA KATCHATAG

COMMUNITY COORDINATOR

SHAKTOOLIK, ALASKA

SHAKTOOLIK IS LOCATED ON THE EAST SHORE OF NORTON SOUND. IT LIES 125 MILES EAST OF NOME AND 33 MILES NORTH OF UNALAKLEET. IT LIES AT APPROXIMATELY 64° 20' N LATITUDE, 161° 09' W LONGITUDE (SEC. 23, T013S, R013W, KATEEL RIVER MERIDIAN). THE COMMUNITY IS LOCATED IN THE CAPE NOME RECORDING DISTRICT. THE AREA ENCOMPASSES 2 SQ. MILES OF LAND AND 0 SQ. MILES OF WATER.

SHAKTOOLIK WAS THE FIRST AND SOUTHERNMOST MALEMIUT SETTLEMENT ON NORTON SOUND, OCCUPIED AS EARLY AS 1839. TWELVE MILES NORTHEAST, ON CAPE DENBIGH, IS "IYATAYET," A SITE THAT IS 6,000 TO 8,000 YEARS OLD. THE VILLAGE WAS ORIGINALLY LOCATED SIX MILES UP THE SHAKTOOLIK RIVER, AND MOVED TO THE MOUTH OF THE RIVER IN 1933. THIS SITE WAS PRONE TO SEVERE STORMS AND WINDS, HOWEVER, AND THE VILLAGE RELOCATED TO ITS PRESENT, MORE SHELTERED LOCATION IN 1967. REINDEER HERDS WERE MANAGED IN THE SHAKTOOLIK AREA AROUND 1905.

History of Shaktoolik storms

We have been through storms year after year. The most recent one is pictured to the left August 2-3, 2019. The first one is of the berm on the ocean side and the second picture is looking up towards the river side. You can see all the water covering the tundra. Picture credit: gloria Andrew.

AUGUST 2019 STORM

SHAKTOOLIK ALASKA STORM SURGE BERM AND RESTORATION

- Shaktoolik got awarded $1 million through the National Fish & Wildlife Foundation to restore the berm in front of our community. We also purchased 2 Dump trucks and 1 water truck with this grant, which was a serious need for us. Pictured to the top right: is a berm restoration in progress. Pictured bottom right: is the crew working the project.

This Photo by Unknown Author is licensed under CC BY

COMMUNITY SURVEY

- We did a community survey in February 2019. Out of 65 surveys handed out, 40 of them returned. 30 out of the 40 people stated they would move with the community. Having a safety access road and an evacuation center was the community's highest priority.

SUBSISTENCE LIFESTYLE

- We rely on our subsistence way of life due to high cost of food. Shaktoolik has a high source of foods from our lands including: Fish, seal, oogruk, beluga, wild birds, caribou, moose, and berries.

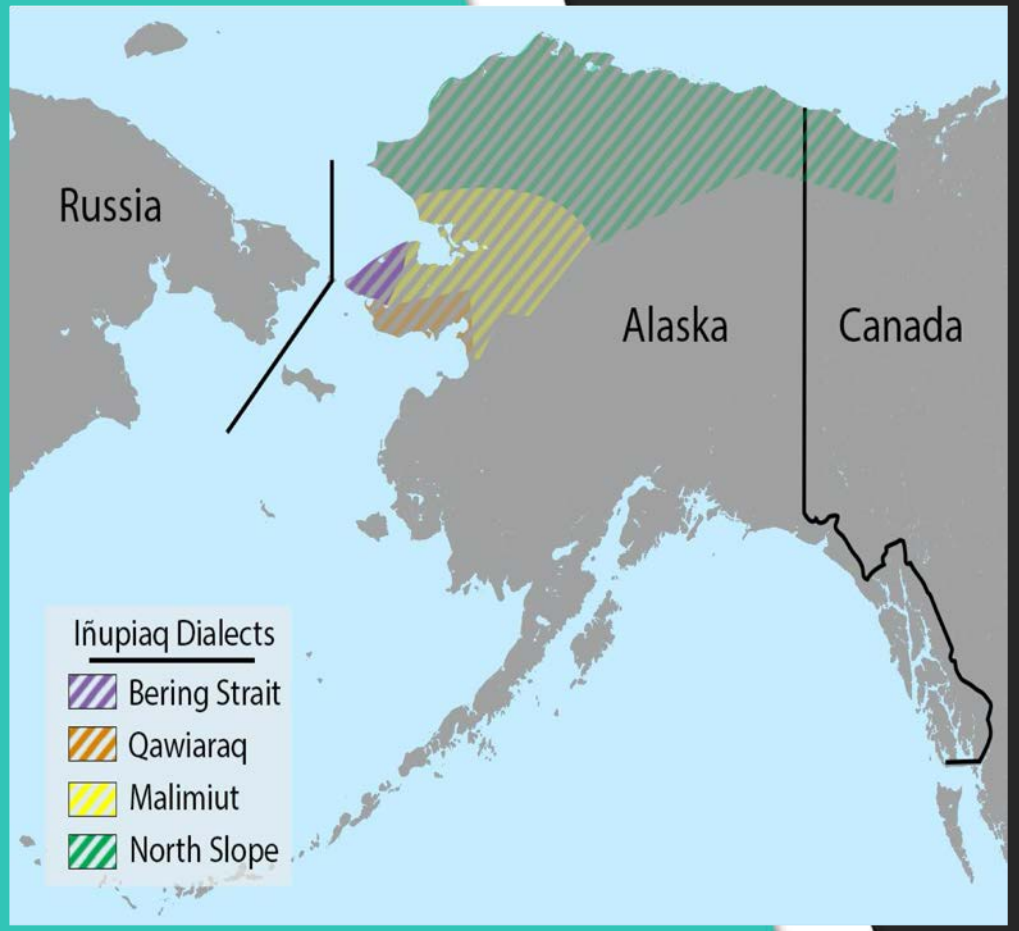
GRANTS

- The Native Village of Shaktoolik got a grant through FEMA Assistance to get an Environmental Assessment done for our future planning. Whether we stay and defend or relocate. It will be up to the Tri-org Council to decide what the next steps are for our community.
- Besides the National Fish & Wildlife Foundation grant we were awarded; we were also awarded a grant through ICDBG and HUD Imminent Threat to restore the berm in front of Shaktoolik and the berm past the old site.
- 2 grants were awarded through BIA Tribal Resilience for 1: my wages, and 2: Planning for Managed Retreat, Expansion, Protect-in-place, and relocation options.

KIGIKTAQ

SHISHMAREF, ALASKA

LOCATION



Shishmaref (Qiġiqtaq in Iñupiaq) is a village, located on Sarichef Island in the Chukchi Sea, just north of the Bering Strait and five miles from the mainland. It lies within the Bering Land Bridge National Preserve. The population was 562 at the 2000 census.

INUPIAQ ESKIMOS

RELY ON SUBSISTENCE SEASONAL HUNTING AND GATHERING THROUGHOUT THE YEAR:

- **SALMONBERRIES**
- **BLUEBERRIES**
- **BLACKBERRIES**
- **CRANBERRIES**
- **VARIOUS ROOTS AND GREENS**

- REINDEER
- CARIBOU
- SEAL
- WALRUS
- MUSKOX
- FISH
- MOOSE

ARE AMONG SOME OF THE MEAT SOURCES HUNTED AND CAUGHT BY OUR PEOPLE

EROSION

A home destroyed by beach erosion tips over in the the Alaskan village of Shishmaref, Sept. 27, 2006.

THE LARGEST DANGER WE CURRENTLY FACE NOW ALONG WITH MANY OTHER RURAL COMMUNITIES IN ALASKA IS: EROSION, AND FLOODING. WE FEAR THE LOSS OF OUR HOMES, AND INFRASTRUCTURE. BOTH CULTURAL AND INDUSTRIAL STRUCTURES, ACCESS TO OUR SANITATION ROAD DAMAGE AND BREACH OF OUR WATER SOURCES ARE PARAMOUNT CONCERNS.

HISTORICALLY

We have sought out help through State and Federal agencies, and scientists in efforts to attain funds for protection, mitigate potential hazards and prepare for expansion to the mainland and protection of what infrastructure remains for the future of our people and preservation of our culture. Our focus and efforts are to create clearer pathways for competitive funds.

Numerous measures to protect Shishmaref and fortify the coastline have been completed. Some of these include:

Installation of Gabions baskets ($736,000)

Riprap Seawall ($10,165,000)

HESCO baskets ($80,000)

Sandbag revetment ($87,858)

Rock revetment ($19,378,925)

Including invested monies used to repair and relocate buildings that were subjected to imminent damage and or flooding the total equates to approx $1,775,000

USACE reported that over the next 50yrs the cost of erosion would be between $47,000,000 and $130,000,000

Critical Infrastructure identified by Shishmaref residence who participated in the survey:

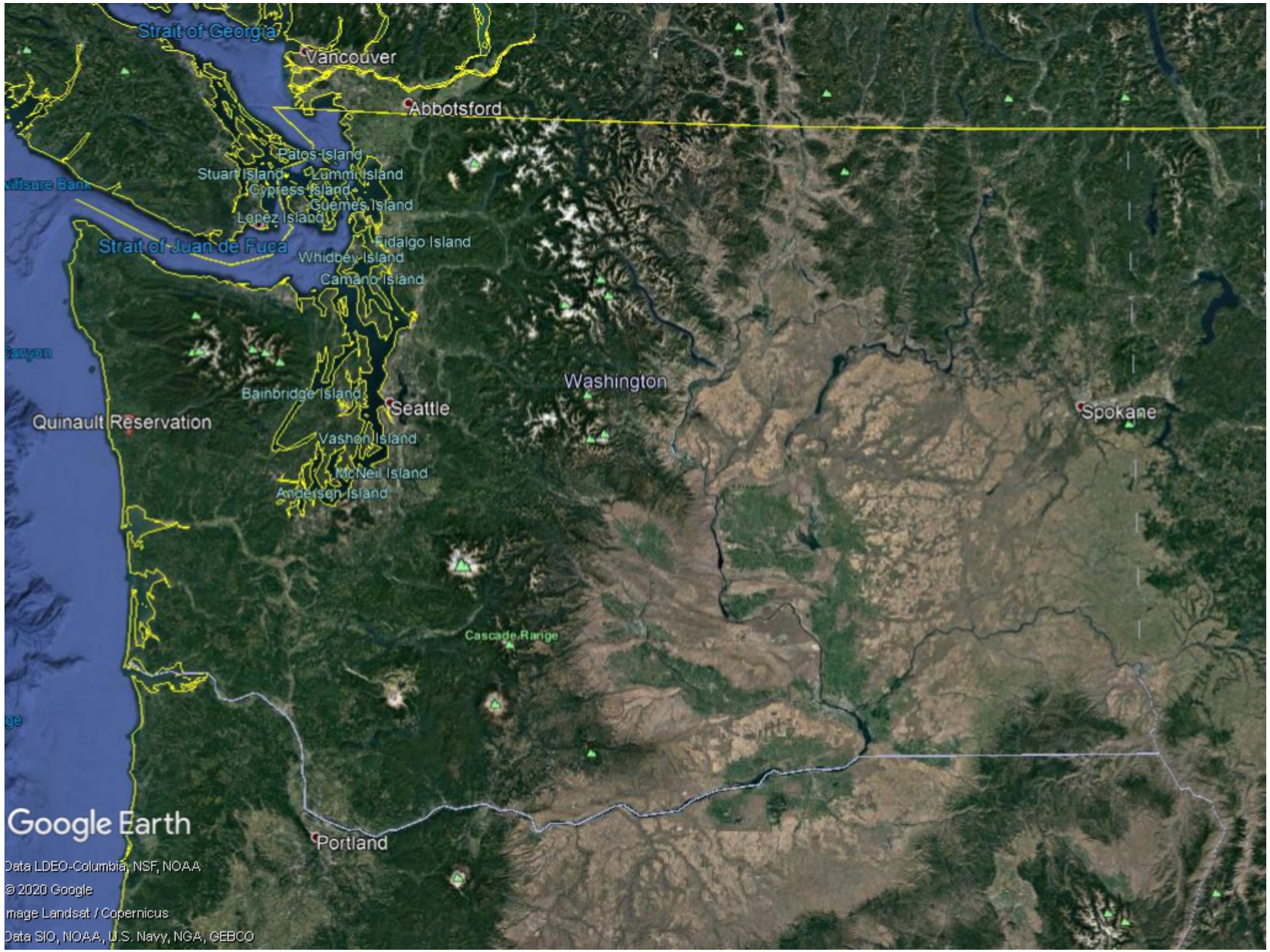
- When asked about measures needed to protect the community in place, 73% of participants agreed that the seawall was necessary to “keep us in Shishmaref as long as we can be home”.
- In addition, participants mentioned that it is necessary to build a seawall around the entire island, while others prioritized a seawall to protect the road to the landfill, airport, meat racks, cemetery and homes in low areas.
- Nine percent of participants stressed the need to relocate immediately to escape the third world living conditions, such as overcrowded homes, lack of land for building additional homes, and a lack of running water and sewer.

The Taholah Village Relocation

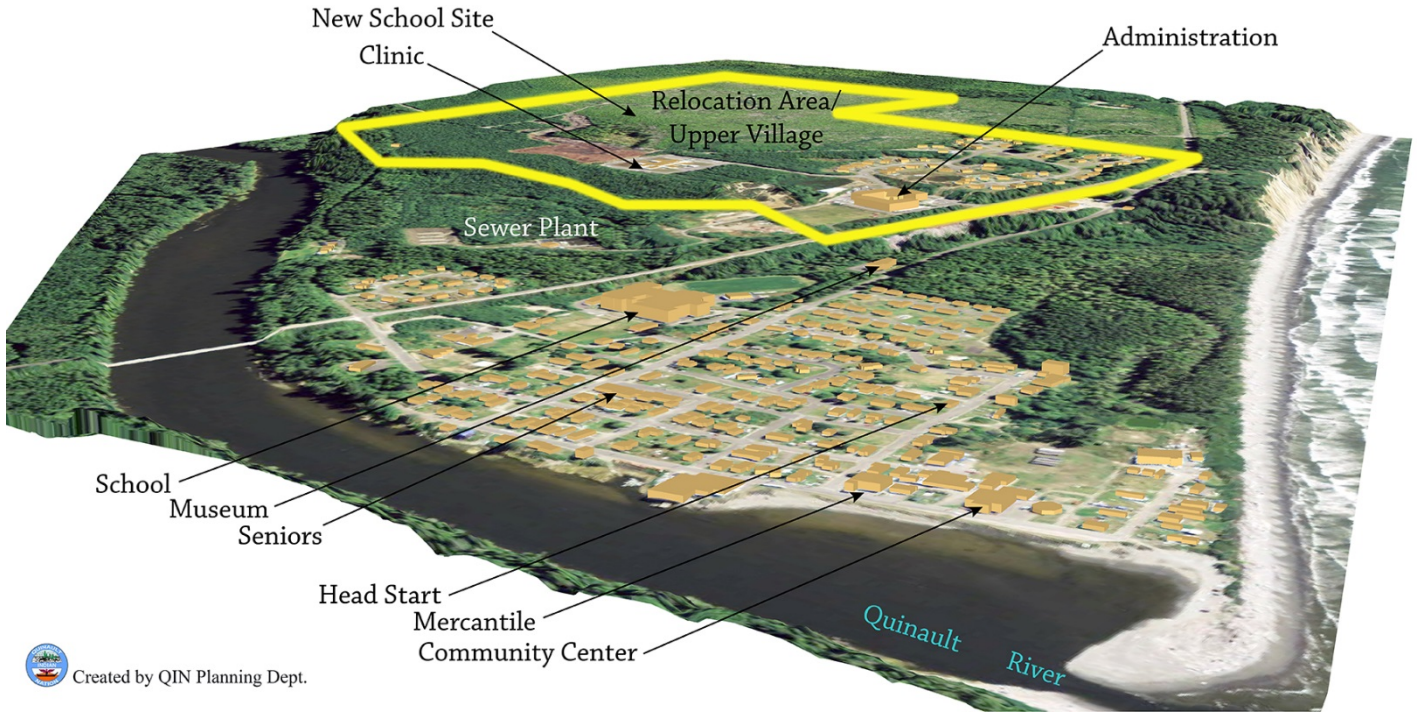
Kelsey Moldenke

Senior Planner

October 22, 2020


Strait of Georgia
Vancouver
Abbotsford
Patos Island
Stuart Island
Lummi Island
Cypress Island
Guemes Island
Lopez Island
Strait of Juan de Fuca
Fidalgo Island
Whidbey Island
Camano Island
Washington
Bainbridge Island
Seattle
Spokane
Quinault Reservation
Vashon Island
McNeil Island
Andersen Island
Cascade Range
Portland
Google Earth
Data LDEO-Columbia, NSF, NOAA
© 2020 Google
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Why Relocate the Village?



Hazards

- Dual threats
  - Sea Level Rise
  - Tsunami from 9.0 earthquake
    - Cascadia Subduction Zone similar to tectonics that caused Indonesian tsunami in 2004
    - 5 to 20 minutes escape time (if good conditions)

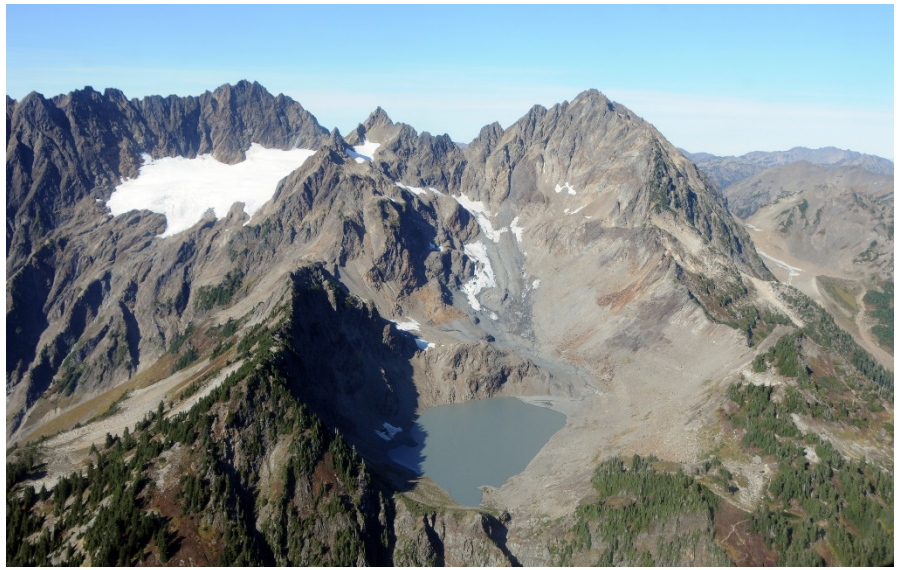
Late 1800's
Sketch of Coastal
Flooding in Taholah

Climate Change and Quinault

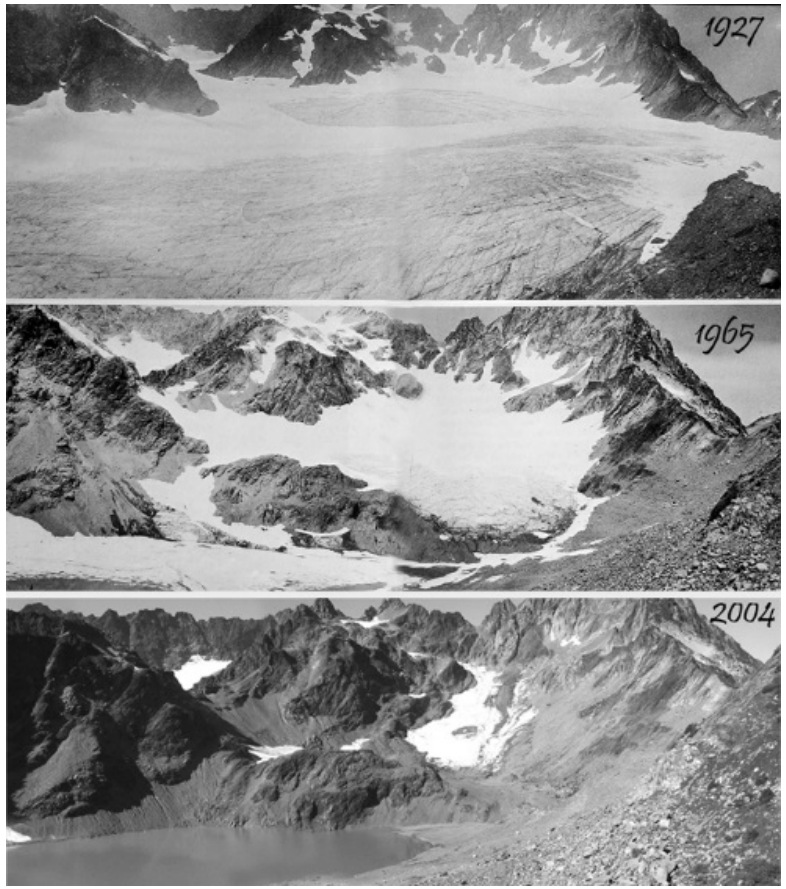
Resources at risk

- Clams – ocean acidification
- Salmon – warm waters, low river flow
- Trees – fire, pests
- The Quinault People

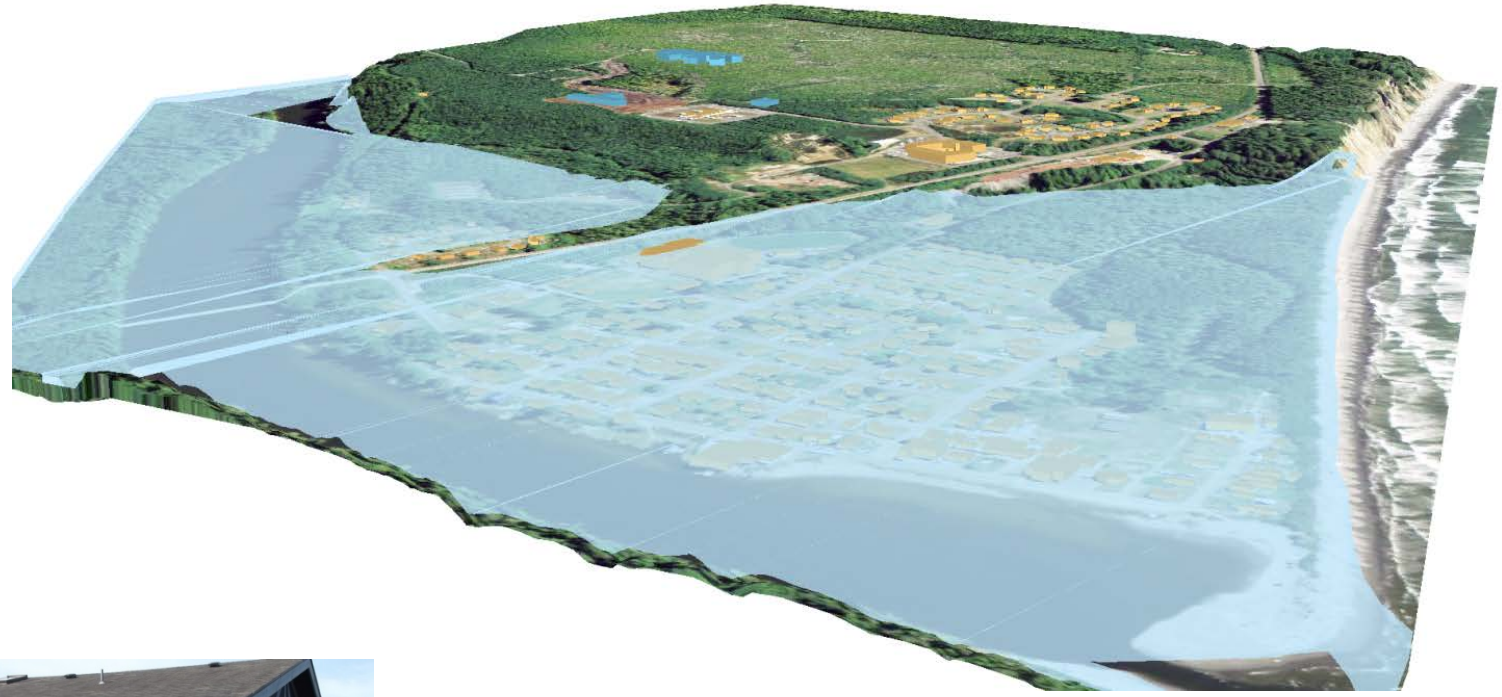
Climate Change and Quinault



Anderson Glacier, Headwaters of the Quinault River, Olympic National Park



Tsunami Inundation

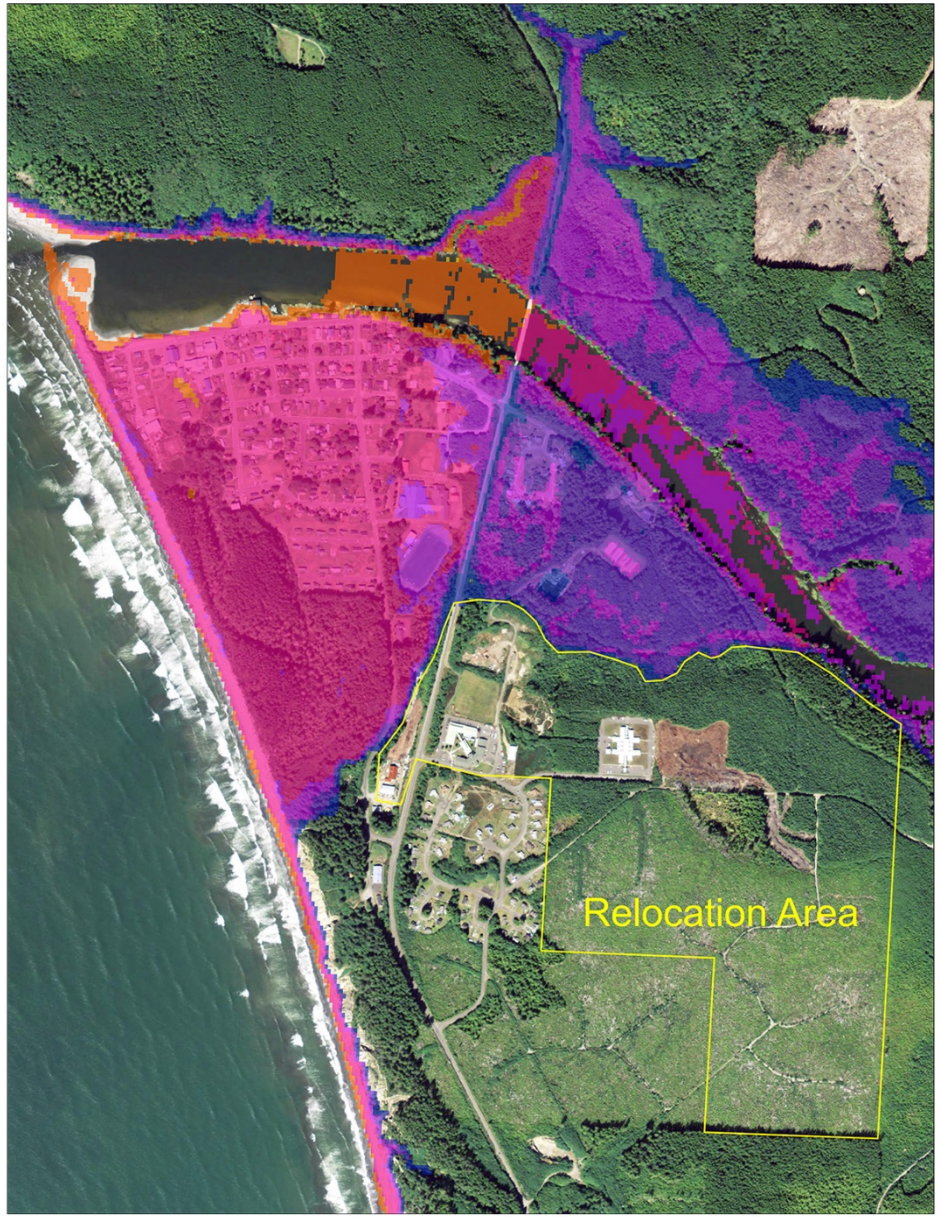


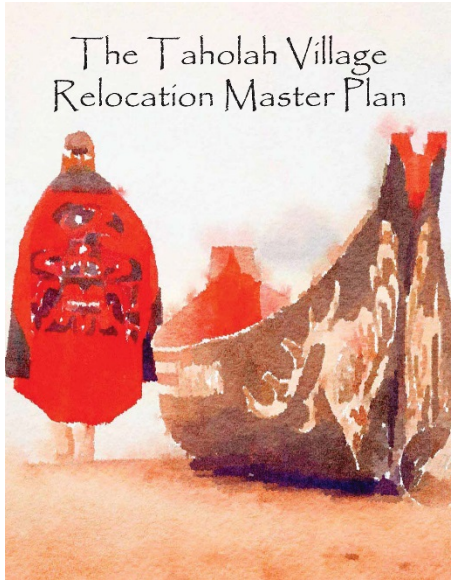
Senior Program

Head Start

Taholah School

Inundation Depth





Community Input

Prior community prioritization
Newspaper articles

April 23, 2014
Taholah Village Relocation Master Plan

Questions for the Community

1. When you think about the lower village of Taholah, what descriptive words come to mind?
2. What do you like about your community? What makes it special?
3. What is your vision for the new, upper village?
4. What characteristics would you bring from the lower village to the new upper village?
5. What type of housing would you like to have in the upper village?
   Single Family_____ Apartments_____ Duplex_____ Other_____
6. What don't you have in the lower village that you want in the new, upper village?
7. What is most important for your children in the new village? Select 3.
   - ❑ Playgrounds
   - ❑ Open/wild spaces
   - ❑ Trails to school/stores/neighbors
   - ❑ Safe streets
   - ❑ Other

Community Surveys:

Handed out at meetings,
On-line, Web Site and Door-to-Door

The Community

- We make the community special; the people, the Elders, the family.
- We all know and trust one another. We all come together in times of need.
- We are moving forward in helping our people, instead of just judging them.
- My community is also special because we look out for each other's kids and keep them safe.

The Vision

- Family friendly village where children are safe.
- Parks and homes reflecting cultural awareness and pride; cedar, salmon, berries, in paintings, poles, canoes and signage.
- The village will be pedestrian-friendly but auto-accessible, with safe, lighted, wide sidewalks, and interconnected trails.
- We see an organic farm where we produce our own vegetables, fruit, potatoes, corn, and other good food.
- We also see green spaces with plants traditionally used by community members providing a connection to our heritage and nature.

Development Needs

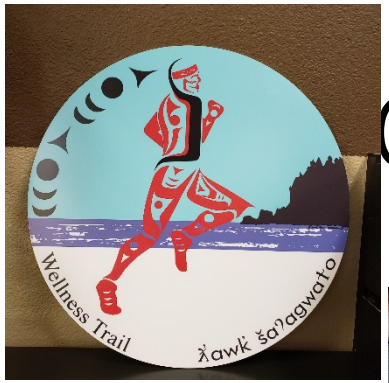
Housing

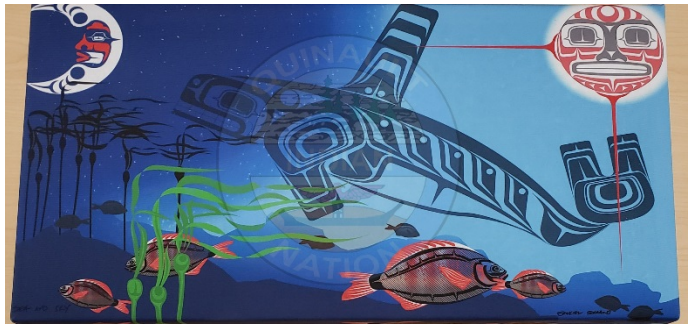
- 175 Homes and 650 people
- 129 Families on Housing Authority Waiting List

Community Buildings

- Administrative Offices, QNEB, QHA, Emergency Services, Courts, Post Office, Child & Health, Social Services = 175,000 SF
- 80,000 SF School

Culture





MALE
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FEMALE
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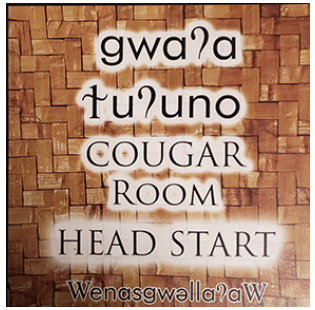
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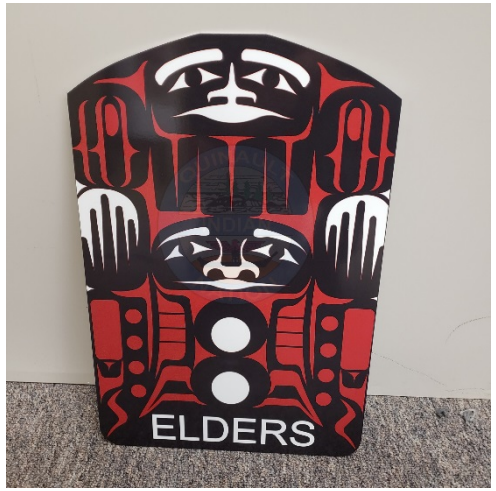
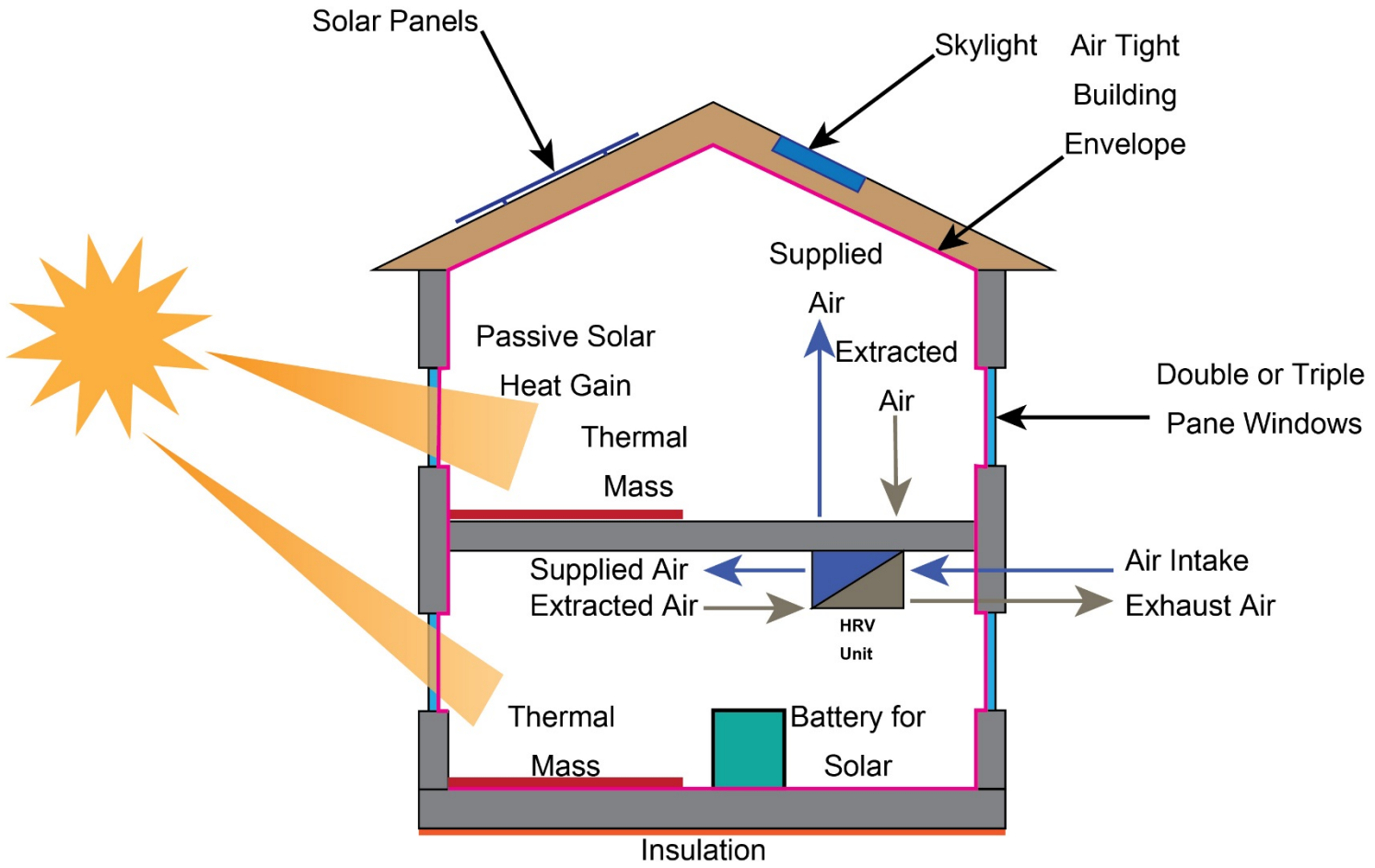
ɬu?uno
COUGAR
ROOM
HEAD START
Wenasgwella?aW


ELDERS

Concept

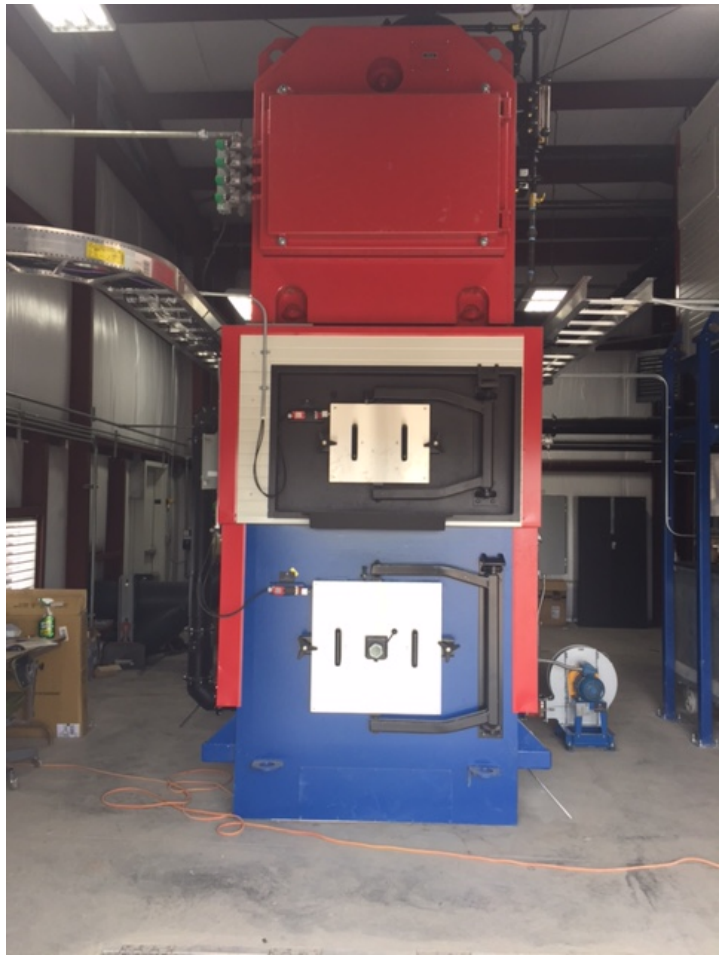
QUINAULT RIVER
EXISTING
UPPER
VILLAGE
School
Energy Park
Park
±5 acre
VILLAGE CONCEPT - MARCH 2017
TAHOLAH VILLAGE RELOCATION MASTER PLAN PROJECT

Quinault House



Energy Efficient and Climate Appropriate

Energy Park



A way to safely shelter in place for months

Inclusion

TEMPORARY TRANSITIONAL/HOMELESS HOUSING CONCEPT

Prepared by QIN Planning Department

Implementation - Funding

- Federal Programs
- USDA Rural Development
- Federal Highway Administration
- FEMA
- Housing and Urban Development/ICDBG & IHBG
- Indian Health Service
- Bureau of Indian Affairs
- Washington State Depts. of Commerce/Health
- Private Funding /Foundations
- Community Investment Tax Credits
- Banks

Barriers to Funding

- Lack of Capital Project Funders, grants for planning, not construction
- Urban focus of efforts or for places that have experience disasters
- Costly Project with Many Aspects, no centralized system
- FEMA/Sovereignty Issues
- Funds may come with strings attached
- Lack of data to match grant goals
- Re-insurance, bonds not really options

Partners

- Federal Agencies
- US Army Corps of Engineers FEST-A Team
- Bonneville Environmental Foundation
- Unitarian Universalist Service Committee First Peoples' Convening on Climate-Forced Displacement
- Isle de Jean Charles

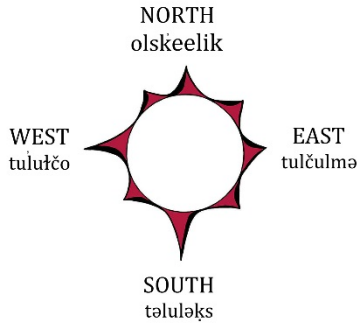
Village Development-Related Opportunities

- Develop and Provide Building Materials from Nation-Owned Resources
- Timber
- Sand and Gravel

WenəsgwəllaʔəW
Generations Building

Where Do We Go Next?

- Grant Writing/Fundraising
- Strategies to Help People to Relocate
- Engineering/Architecture Plans/Build!
  - One building down, so many to go!
- Moratorium in Lower Village
- Additional NEPA (Federal Environmental Review)
- New Staff (e.g. parks maintenance year-round)
- Continue Alternative Energy Projects
- Queets Relocation



Siokwil

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Questions?

EcoAdapt

Thanks for joining us!

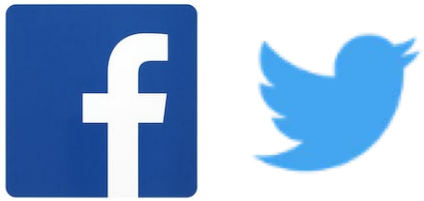
Upcoming Sessions:

October 29 Part 4: Migration & Receiving Communities

November 5 Part 5: Policy Considerations at Multiple Scales

You're invited to a virtual discussion!

To participate - follow or join us at your preferred network below.



@AdaptationForum

Group: National Adaptation Forum

All webinars are announced on our social media

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