



Preparing for the Fall Storm Season: Flood & Erosion Observations

**LEO Network Webinar
September 2021**

Jaci Overbeck

Alaska Division of Geological & Geophysical Surveys
Coastal Hazards Program

Photo from National Weather Service Observations at Kotzebue August 2019

Storm Summary

Last major storm event was in 2011.
 DGGs starts monitoring storms more closely in 2016
 working with communities, see about 7 events per
 year, mostly minor.

2016

- September Port Heiden
- September Shaktoolik and Unalakleet
- October Western, Golovin and Nome
- December Kuskokwim and Lower Yukon

2018

- February Diomede
- March Western, Kotlik
- June Unalakleet
- July Kotzebue and Deering
- August Bristol Bay and Norton Sound
- October Newtok
- November Kotlik



2020

- August Bristol Bay
- September/October Golovin
- October Hooper Bay
- November Shishmaref, Nome, Shaktoolik
- November Scammon Bay, Kivalina, Nome, Shishmaref
- November Golovin
- November Kotlik
- November Nelson Lagoon
- December Hooper Bay

2017

- September Golovin and Nunam Iqua
- September Utqiagvik
- October Kuskokwim and Lower Yukon
- October Golovin and Kotlik
- November Western, Kusko to Kivalina
- December Kwigillingok
- December Northwest

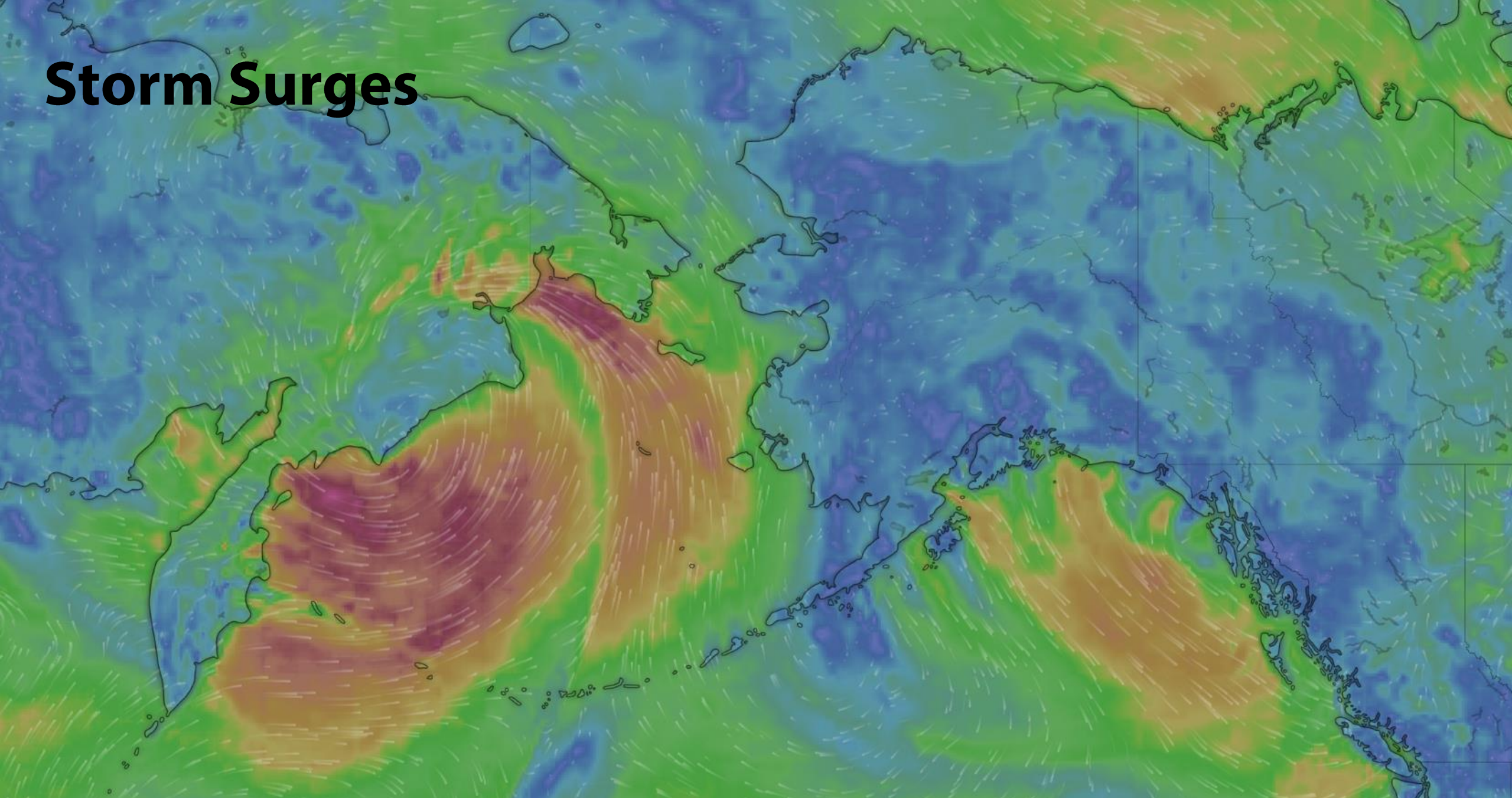


2019

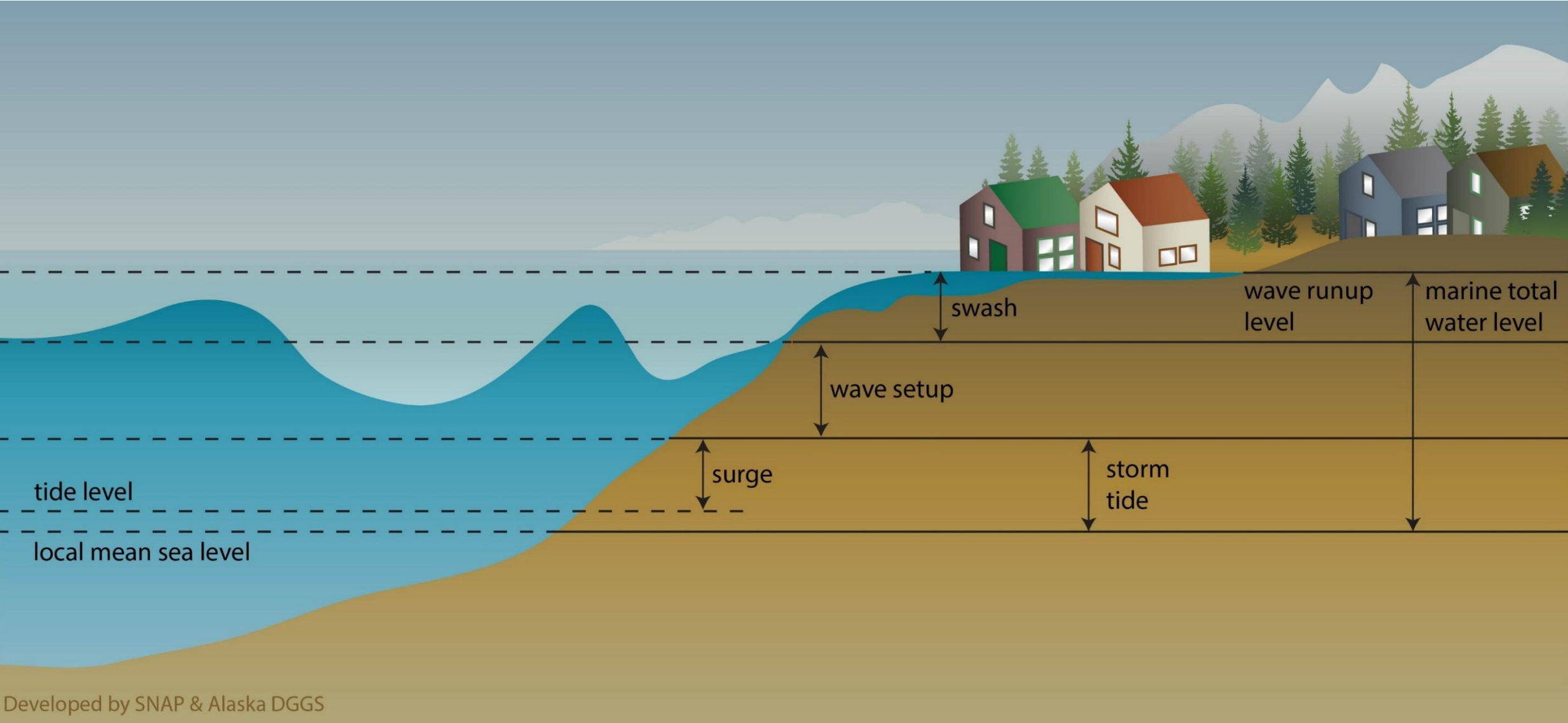
- February Norton Sound, Kotlik
- July Kotlik
- August North Slope
- August Western
- September Golovin
- September Kwigillingok
- November Norton Sound and Yukon



Storm Surges



Storm Surges



Storm Surges

Sea ice mitigates wave development in off/nearshore.

Sea ice reduces friction on water level bulge travelling toward coast.

Nearshore transported onto beach as slush berm or Ivu.



Local forecast by "City, St" or ZIP code

Enter location ...

Go

News Headlines

- [Anchorage International Airport Climate Highlights for August 2021](#)
- [Kodiak NOAA Weather Radio Transmitter Temporarily Out of Service](#)

[Location Help](#)

NWS Alaska Sea Ice Program (ASIP)

[Weather.gov](#) > [Anchorage, AK](#) > NWS Alaska Sea Ice Program (ASIP)

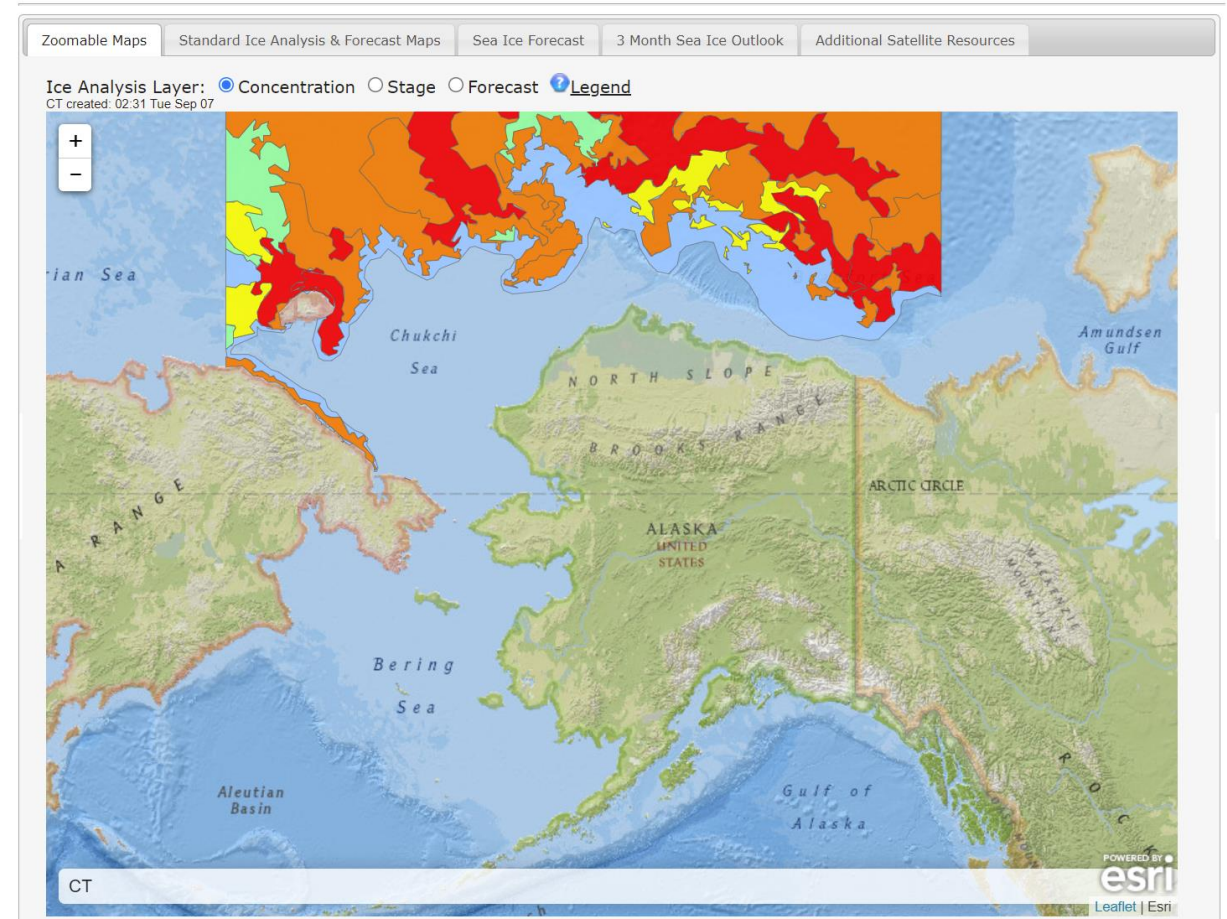
Anchorage, AK

Weather Forecast Office

Our ASIP is staffed 7 days a week from 6:30 am to 3:30 pm

Operations Phone Line: 907.266.5138

Operations Email: nws.ar.ice@noaa.gov



Be Prepared

FEMA Resources

<https://www.ready.gov/floods#during>



Floods

Prepare for a flood

During a flood

After a flood

Associated content

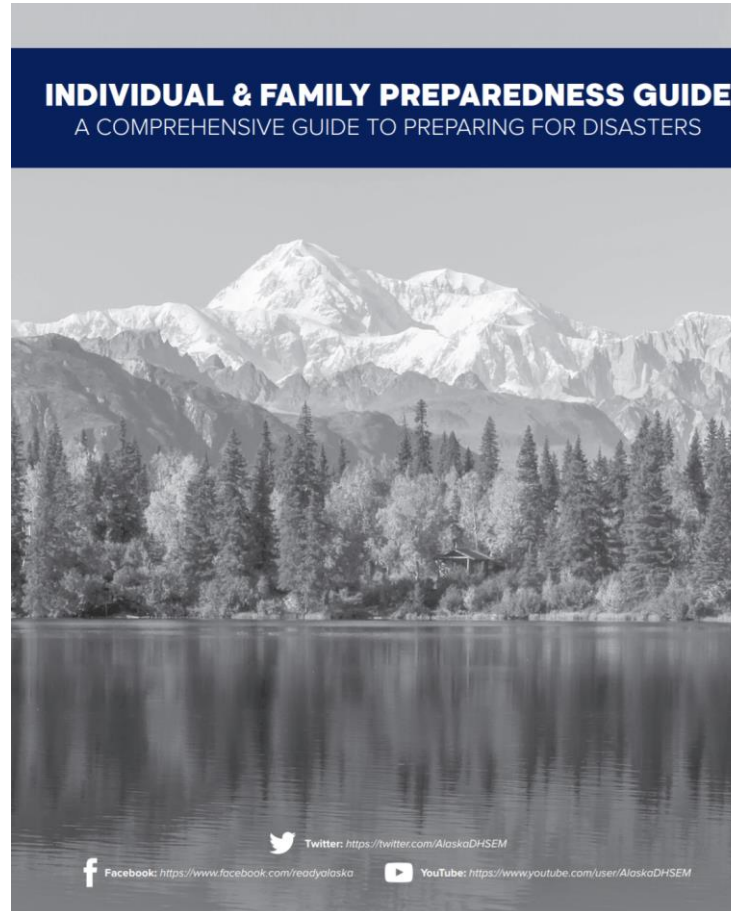
Flooding is a temporary overflow of water onto land that is normally dry. Floods are the most common natural disaster in the United States. Failing to evacuate flooded areas or entering flood waters can lead to injury or death.

Floods may:

- Result from rain, snow, coastal storms, storm surges and overflows of dams and other water systems.
- Develop slowly or quickly. Flash floods can come with no warning.
- Cause outages, disrupt transportation, damage buildings and create landslides.

DHS&EM Resources

<https://ready.alaska.gov/>



National Weather Service Updates and Forecasts

<https://www.weather.gov/arh/>

<https://www.facebook.com/NWSFairbanks/>

<https://www.facebook.com/NWSAnchorage>

US National Weather Service Fairbanks Alaska
August 27 at 11:22 AM · 🌐

A High Surf Advisory is now in effect for the Chukchi Coast from Cape Krusenstern to Point Hope including Kivalina. Water levels of 2-4 feet above the normal high tide line are expected tonight into tomorrow morning. Residents are encouraged to secure items by moving them away from the beach. Minor erosion is possible. #akwx

HIGH SURF ADVISORY
Created: 8/27/21 11:15AM AKDT

Where: (Yellow Line)
 Chukchi Sea coast from Cape Krusenstern to Point Hope, including Kivalina.

When:
 Overnight tonight and tomorrow morning.

What:
 Water levels of 2 to 4 feet above the normal high tide line.

Additional Details:
 Wave action may wash to the top of the beach. Residents are encouraged to secure items by moving them away from the beach. Minor erosion is possible.

National Weather Service Fairbanks, AK @NWSFairbanks

👍👎 27 11 Shares

👍 Like 💬 Comment ➦ Share



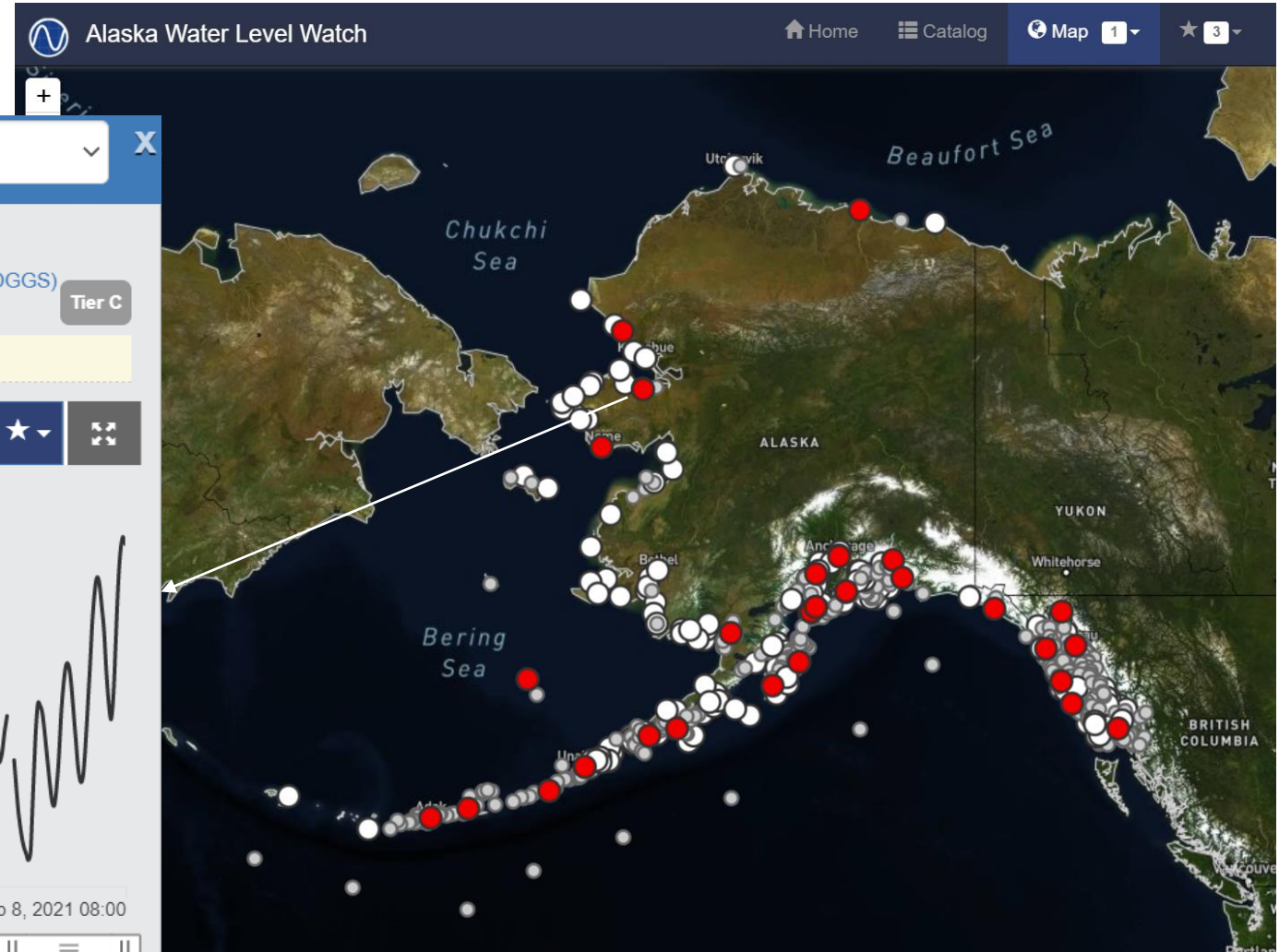
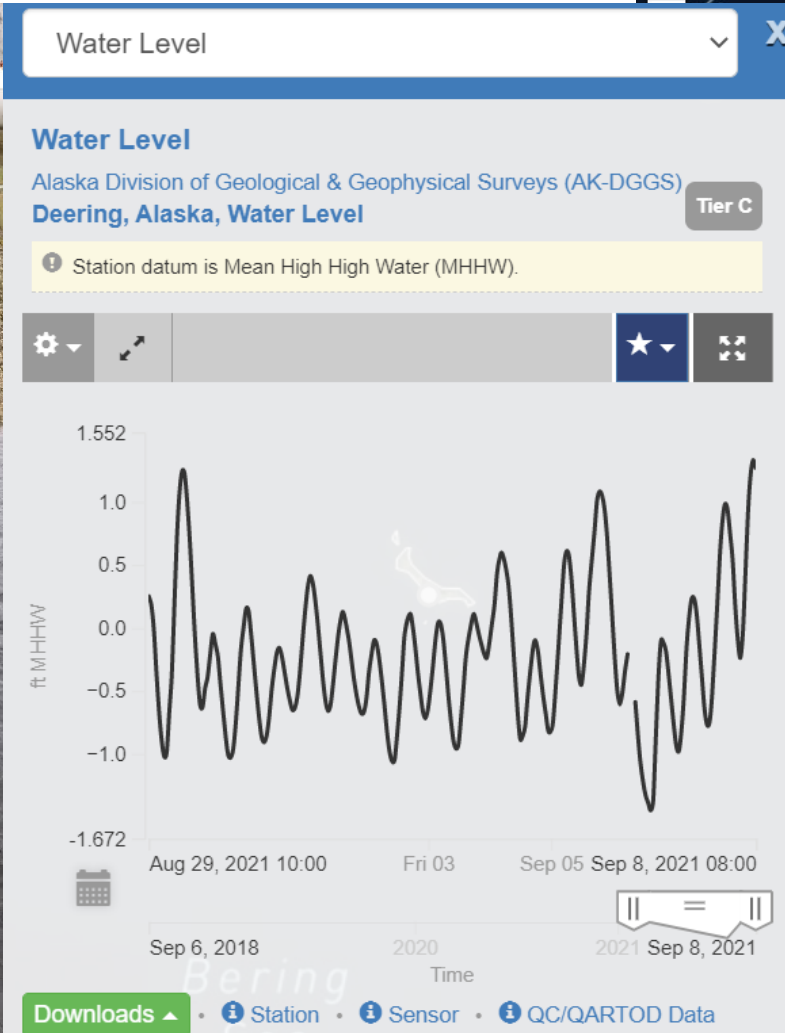
Storm Observations

A photograph showing a flooded residential area. A wooden boardwalk leads through the water, flanked by houses and debris. The sky is overcast and grey.

Photo taken by Harold Okitkun, Native Village of Bill Moore's Slough, Kotlik, August 2019

Storm Observations

Water level sensors



<https://water-level-watch.portal.aos.org/#map>

Storm Observations

Water level sensors



Deering



Kwigillingok

In Need of Repair

- Kotzebue
- Tununak

Will be Installed this Year

- Dillingham

Operational in Western and Northern AK

- Naknek
- Bethel
- Nome
- Red Dog
- Unalakleet
- St. Michael
- St. Paul

Storm Observations

Community Monitoring of Erosion
Stakes for Stakeholders

Webcam at Napakiak



Installing stakes and camera at Wainwright



<https://dggs.alaska.gov/hazards/coastal/monitoring.html>

Storm Observations

Take Photos!

Past photos:

<https://maps.dggs.alaska.gov/photodb/> Search **storm**

Submit photos to DGGS:

<https://www.facebook.com/AlaskaWaterLevelWatch>

Or email to:

Jacquelyn.Overbeck@alaska.gov

We will ask for permission to post photos on the DGGS photo database.

The screenshot shows the website header for the Alaska Division of Geological & Geophysical Surveys. The navigation bar includes links for 'State of Alaska', 'Natural Resources', 'Geological & Geophysical Surveys', and 'Photo Database'. A search bar at the top right contains the text 'storm' and a 'Search' button. Below the search bar is a map of Alaska with several purple circles indicating photo locations. The map includes a scale bar (500 km, 500 mi) and coordinates (70.5542, -172.1484). Below the map are navigation buttons: 'Reset', 'Previous', 'Displaying 97 - 192 of 373', and 'Next'. A dropdown menu shows 'Showing 96' and a 'Sort by' dropdown set to 'Score'. The main content area displays a grid of 12 photos, each with a caption below it:

- Shishmaref storm 2004 October 18 p06 unknown
- Seward storm 2009 December 1 p01 unknown
- Scammon Bay storm 2004 October 18 p05 unknown
- Shishmaref storm 2004 October 18 p01 unknown
- Togiak storm 2005 September 7 p01 unknown
- Seward storm 2009 December 1 p03 unknown
- Teller storm 2004 October 18 p04 unknown
- Seward storm 2009 December 1 p02 unknown
- Scammon Bay storm 2004 October 18 p02 unknown
- Seward storm 2009 December 1 p05 unknown
- Shishmaref storm 2004 October 18 p04 unknown
- Shishmaref storm 2004 October 18 p03 unknown

Storm Observations

Henry, John, Olivia Lee and Richard L Thoman Jr. 2019. Coastal Flood Advisory. *LEO Network* (leonetwork.org). Accessed 9 September 2021.

Submit observations on LEO

We work with LEO as an observation resource.

EVENT
FEBRUARY 12, 2019

Coastal Flood Advisory

- WEATHER
- OCEAN / SEA
- SURFACE WATERS
- ICE AND SNOW
- AIR
- SEASONAL TIMING
- STORM SURGE



Unalakleet, Alaska, United States

$N 63^{\circ} 52' 23.016'' W 160^{\circ} 47' 17.016''$

Nearby



Storm Observations

Photo tips:

- Stay safe!
- Make sure there is some sort of building or other infrastructure that is in the photo so we know where it was taken.
- Make sure to communicate what time the photo was taken.
- Was the photo taken at the peak of the flood or another time?
- If you take a lot of photos, photograph the same location through time.



Photo: taken by Sophia Katchatag Shaktoolik

What do we do with the observations?

Flood Mapping

Written flood record and maps with communities

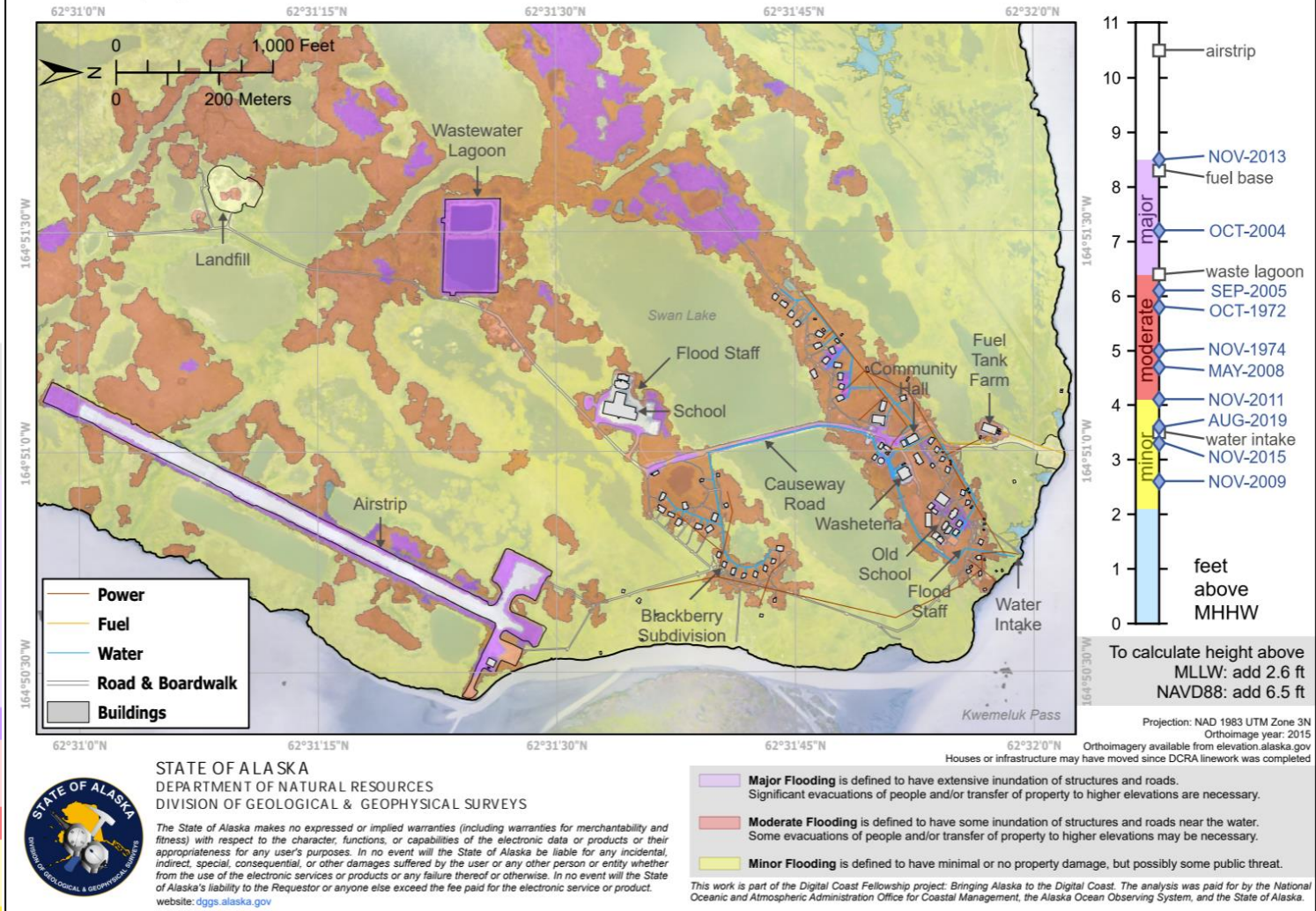
<https://dgggs.alaska.gov/pubs/id/30573>

- Golovin
- Hooper Bay
- Nunam Iqua

	Elevation Feature	Elevation (ft MHHW)
Other	School (evacuation center)	13.1
	*Old school front door grating	13.1
	Airstrip covered	10.5
	Several buildings	10.2
Major	Highest recorded storm	8.5
	Fuel tank farm	8.3
	Airstrip use or access	7.5
	Lowest residence flooded	7.2
	Access across Causeway Road	6.8
	*Recommended building height	6.8
	Wastewater facility	6.4
Major		6.4
Moderate	Water under lowest building	4.2
	Drinking water source	4.1
	Moderate	
Minor	Access road threatened	3.2
	Beach property	2.1
	Minor	

Coastal Flood Impact Map Nunam Iqua, Alaska

REPORT OF INVESTIGATION 2021-1A
Buzard and others, 2021
NUNAM IQUA



Erosion Records

Coastal Erosion Monitoring Port Heiden, Alaska

Transect 1
LAST UPDATED 2020


 Department of Natural Resources
GEOLOGICAL & GEOPHYSICAL SURVEYS

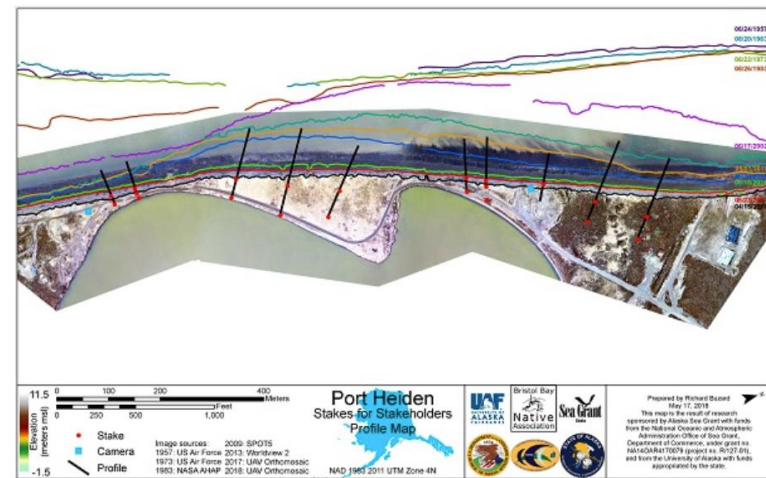
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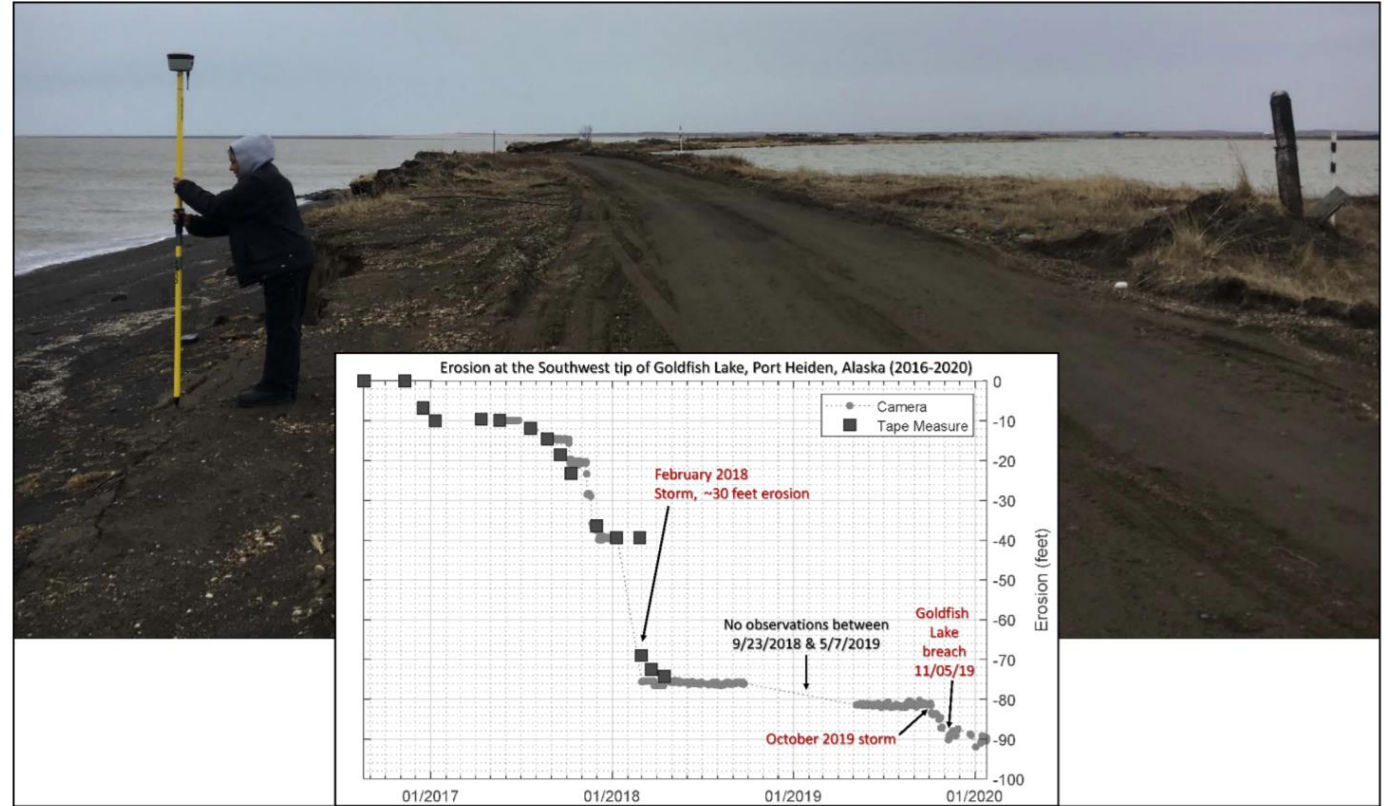
Port Heiden Erosion Monitoring

Time-lapse cameras were installed in 2016 to monitor the shorelines fronting Meshik, the old village site for Port Heiden. Funding to install equipment was provided by Alaska Sea Grant and Alaska Ocean Observing System. The install was a collaboration between DGGS, University of Alaska Fairbanks, Bristol Bay Native Association, and Alaska Sea Grant.



[Click for enlarged PDF version of the profile map.](#)

Monitoring Sites
Aleknagik
Chignik Bay
Chignik Lagoon
Chignik River
Dillingham
Ekuk
Golovin
Kotlik
Kwigillingok
Levelock
Naknek
Nelson Lagoon
Pilot Point
Port Heiden
Quinhagak
Shishmaref
Togiak



Distances are in feet
Photograph collected 5/22/2017



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

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website.dggs.alaska.gov

Summary of erosion monitoring site at Port Heiden, Alaska. Plot shows contemporary bluff erosion since the monitoring site was established in 2016. Arrows point to significant erosion events. The monitoring site was established collaboratively between DGGS, University of Alaska Fairbanks, Bristol Bay Native Association, Alaska Sea Grant, and the Native Village of Port Heiden.

Coastal Erosion Monitoring Port Heiden, Alaska

Transect 1
LAST UPDATED 2020



Questions

For more information

<https://dggs.alaska.gov/hazards/coastal/>

We conduct this work with funding from the Alaska Ocean Observing System and the State of Alaska.

AOOS
Alaska Ocean Observing System



Jaci Overbeck

Jacquelyn.Overbeck@alaska.gov

907-451-5026

Photo taken by Harold Okitkun, Native Village of Bill Moore's Slough, Kotlik, August 2019