Welcome
Welcome to the second AAOKH news! Over the next few pages we’ll share how local observers in coastal Arctic Alaska contribute to our understanding of rapid change. Explore how warming air and ocean temperatures, shrinking sea ice and growing open water periods are impacting wildlife and the Indigenous way of life.
Meet AAOKH’s new faces, including a graduate student originally from Utqiagvik, who will help communities monitor coastal erosion to inform adaptation planning.

What is AAOKH?
The Alaska Arctic Observatory and Knowledge Hub is a resource for northern Alaska coastal communities. AAOKH (pronounced A–OK) provides tools, resources and scientific information to share their expertise and observations of environmental change. Community-based observations focus on changes in sea ice, wildlife and coastal waters.

We are also a knowledge hub
AAOKH provides tools and a hub for sharing relevant observational data. The hub focuses on the changing seasonal cycle. There are three main goals:
• Share and document community observations
• Make wildlife, ocean data and information from scientists accessible to communities
• Provide resources for education and outreach
What do the observations say?

AAOKH observations focus on sea ice, wildlife and coastal waters. They contribute to, and are stored in, a National Science Foundation-funded Exchange for Local Observations & Knowledge of the Arctic (eloka-arctic.org/sizonet). Since 2016, AAOHK observers have contributed over 1,700 community-based observations. These are combined with the historic Seasonal Ice Zone Observing Network database (2006–2016) of over 5,000 local observations.

Satellite image April 3, 2019
Northern Bering Strait and Kotzebue Sound had open water in April when ice typically is at its thickest. Sea ice change is impacting the timing of spring marine mammal hunting.

“In mid-January, a Russian tanker transited Bering Strait with no ice. By mid April, the Bering Sea had no ice.”

Austin Ahmasuk, AAOHK steering group member

May 2nd & 3rd, 2019
“I was pleasantly surprised that the sea ice landed on our beaches this week. There’s still time to catch seals & Oogruk in the Nome area... this is the first time I’ve seen so many walrus so close to Nome.”

Frank “Boogles” Johnson, Sea Ice for Walrus Outlook, an AAOHK partner organization

Wainwright
Whaling happened in the end of April to early June. Landfast ice edge was close to, or even just in front of town.

May 5, 2019
“Close in ice edge subsistence just out front [of town]. Spring migration of waterfowl and tundra birds along with spring conditions slowly showing up.” 23°F, mist, sleet & fog

May 6, 2019
“Landfast [ice] keeps breaking away.”

May 7, 2019
“Big ocean shows itself with so much ice gone. Huge lead and waves makes for snap, crackle and pop.”

Steven Patkotak, AAOHK observer

Kotzebue
Warm winter with open water, lots of snow and storms.

March 16, 2019
“We had a total of 20 storms in February. Unheard of... A friend went to the mouth of the Noatak to fish and drilled a hole. He said it was less than a foot thick. Word is the ice near the mouth where the strong currents are is already getting dangerous. Too much snow, warm temperatures, and over flow under the fresh snow will cause the strong currents to eat away at the already thin ice. With so much water in the Kotzebue Sound, the waves get huge during a storm event and breaks up the ice.”

Bobby Schaeffer, AAOHK observer

May 13, 2019
The Noatak channel opened to the ice edge triggering the start of ugruk hunting. “Lots of successful hunters, very early. My Dad said he remembers [May] 28 as the earliest he hunted, usually first two weeks in June.”

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Satellite image June 7, 2019
The extremely early opening of the Beaufort Sea was striking this year. Typically, in June only ice should be visible in this satellite image.

June 7, 2019
“Considerable fast ice remains east of Nuvuk to Camden Bay, but much less shore ice farther east. There is just a thin band of ice beyond the fast ice northeast of Nuvuk separating the Beaufort and Chukchi waters and that has been shrinking rapidly the past few days.”

Water temperatures in the big area of open water was 29°F to 32°F warming into the mid 30s offshore of the MacKenzie delta.

Rick Thoman, Climate specialist and contributor to AAOHK

Wales
April 11, 2019
“The last of the shorefast ice left the land and pretty much all flow ice with the exception of what’s on the beach.”

May 31, 2019
“This week and for the past month, we’ve been ice free with the exception of river and lagoon ice, but that has been unstable to travel on... No whaling this year [due to insufficient or unstable ice].”

Robert Tokeinna Jr, Sea Ice for Walrus Outlook, an AAOHK partner organization

Utqiagvik
February 8, 2019
“West [winds]. Lead has closed up. Shorefast had broken off from in front of town, but grounded ice in front of the [gravel] pit has stayed, fresh ridges only 1.5 mile out.”

Joe Mello Leavitt, AAOHK observer

In spring, there was a wide lead close to Utqiagvik, with warm weather and strong currents from the south affecting whales.

April 25, 2019
at Nunavaaq “high winds and waves have eroded the ice edge about 20 feet.”

April 29, 2019
“Currents were at least 5 mph!”

June 9, 2019
Early arrival of walrus near Utqiagvik. “Walrus were seen on large flos of ice. So we decided to take our small boats over the ice with snowmachines and 4 wheelers.”

Billy Adams, AAOHK observer

Kaktovik
Open lead developed early in front of Kaktovik.

June 3, 2019
“Spring came early. May 31, the Hulahula River came out to the coast. Open water ~1 mile offshore and Camden Bay didn’t freeze all winter.”

Lee Kayotuk, AAOHK steering group member

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Warming ocean

Measuring ocean temperature
AAOKH observers gather data on ocean conditions using an instrument called an electronic Conductivity, Temperature, Depth (CTD). One of the things they measure is the temperature from the ocean’s surface down to the seafloor.

This July, Steven Pakotak measured warmer than normal water near Wainwright.

“West winds and warmer ocean sea water and can see humid air going up from topside ... Looking for crabs and amber but sea water is not easy to see through.”

Steven Pakotak, AAOKH observer

In Kotzebue, Vince Schaeffer measured that the entire water column near town was warm. The cool pool of water usually near the bottom of the ocean disappeared.

“The waters got too warm in the ocean so the crab split to deeper colder waters in mid July. This was a first. The CTD out in the Sound outside Espenberg on July 18 measured 64°F with very little salinity. Crazy!”

Bobby Schaeffer, AAOKH observer

Water temperature around Alaska
Warm water temperature and sea ice loss are impacting all of Alaska’s northern waters. Summer sea surface temperatures around Alaska have been much warmer than average during 2014–2018. Summer 2019, surface waters were 4–11°F warmer than average along the entire Bering and Chukchi coasts.

More large open water areas
Recent years have seen a dramatic increase in the duration of open water in the Chukchi and Beaufort Seas. In both seas there is now typically open water for three to four months.

Chukchi Sea ice extent decline
Sea ice extent in the Chukchi Sea has declined dramatically outside of winter in recent years, especially during the late summer. Typical ice extent in summer is only 10% of what it was in the early 1980s, and the September Chukchi Sea ice edge is now regularly hundreds of miles northwest of the Alaska coast.

Utqiagvik whaling trails
Each spring Utqiagvik hunters build trails across the shorefast sea ice to access bowhead whale hunting areas. Since 2008, the whaling community, North Slope Borough and a team of University of Alaska scientists have mapped the trails and measured their ice thickness. The trail maps are provided to the community during the hunting season (mid-April–mid-May).

AAOKH now supports scientists Matt Druckenmiller and Josh Jones to continue this important work. We’ve included an overview of the past three years of trails on this page, and all 13 years of maps are available online at arctic-aok.org/data/whaling-trail-mapping. This work is a partnership with University of Alaska Fairbanks and the National Snow and Ice Data Center, field support from Utqiagvik Inupiat Corporation.

Exploring trail thickness data
AAOKH scientists are now exploring how the ice thickness along the trails has changed over the past thirteen years. The graph below shows how often the whaling trails in 2017–2019 crossed ice of different thicknesses. In the simplified trail maps on the right you can see how the trails and the sea ice changed each year.

How often does the trail cross ice of a certain thickness

In 2018, the trail crossed 3 to 4 feet ice 35% of the time.

In 2017, the trail crossed ice thicker than 4 feet (often nubile fields) 33% of the time.

In 2017 & 2019 the trail didn’t cross any ice less than 1.5 feet thick.

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2017 Most common ice thickness along trails was 5.6 feet (sea first yellow peak). This means that people most often traveled across fairly thick first year ice. There was little to no ice less than 4 feet so trails crossed almost no thin young ice (skikulaq).

2018 Most common ice thickness along trails was 3–4 feet (see first blue peak). Ice of this thickness dominated the trails, so people mostly traveled across fairly thin first year ice.

2019 Most common ice thickness along trails was 3–5 feet (see first red peak). In general the ice thickness varied more compared to the past two years.

The history of whaling trail maps
The late Warren Matumeak hand drew the first known maps of Utqiagvik’s ice trails in 2001. Craig George, wildlife biologist (emeritus) with the North Slope Borough, worked with Warren to map those trails using a hand-held GPS. That early partnership was the foundation for today’s Utqiagvik whaling trail maps.

Want to see what else is changing in and around Alaska? Visit https://wp.me/P6Y12P-1Hd.
Unusual seal observations

A reoccurring theme among AAOKH observations this year was of stranded ice seals and observations of unhealthy seals.

“This spring in Bering Sea and Straits region, we are seeing massive marine mammal strandings that started with bearded seal pups that are emaciated. It’s been all ice seal species and walrus now.” [June 3, 2019] Austin Ahmasuk, AAOKH steering group member, Nome

Summer 2019, NOAA fisheries declared an unusual mortality event in the Bering and Chukchi seas after more than 280 ice seals were reported stranded in the region over the past two years. Scientists do not know why the ice seals are stranding. AAOKH will continue to document unusual marine mammal observations by our local observers. Timely observations of dead, injured or stranded marine mammals are extremely important and can help biologists investigate the problem.

REPORT unusual or dead marine mammals! *When possible, include the date, location and photos.

- All areas NOAA’s Alaska Marine Mammal Stranding Network 24-hour Hotline: 877-925-7773
- North Slope Borough North Slope Borough Department of Wildlife Management: 907-852-0350
- Bering Strait Region Kawaiak, Inc. Subsistence Program: 907-443-4265; Eskimo Walrus Commission: 877-277-4392

Coastal erosion

ROBERTA JO TUURRAQ GLENN

“I grew up and graduated high school in Utqiagvik, [I’m] now living in Anchorage...I also have lots of family in Wainwright.”

Welcome AAOKH’s new graduate student!

Monitoring shoreline erosion

AAOKH’s graduate student Roberta Glenn is developing community focused techniques to monitor shoreline erosion in Bristol Bay and the North Slope. She will use community-based monitoring, coastal surveys and aerial imagery to help inform community planning, disaster preparedness and relocation efforts. The project will launch spring 2020 with a collaborative erosion monitoring study in Wainwright.

Erosion in Wainwright

In 2014, the community of Wainwright wrote a Comprehensive Plan that identified coastline erosion next to town as a threat. Continued Arctic warming is expected to continue diminishing the natural protection provided by sea ice and permafrost resulting in increased coastal vulnerability to water, wind and waves. Roberta’s study, which is outlined below, may help Wainwright respond to these concerns.

Erosion DATA

- COLLECT EROSION DATA
  - GPS surveys of coastlines
  - Historical satellite images
  - Local observers will monitor significant erosion events

- TURN DATA INTO PRODUCTS
  - Track erosion rates
  - Maps of change & vulnerable areas
  - Statistics & figures

- INFORM COMMUNITY PLANNING
  - Adaptation strategies
  - Mitigation of coastal hazards
  - Self-sufficiency
  - Local capacity to track coastal change

Science team

Who are AAOKH’s scientists?

AAOKH has two staff scientists. Donna Hauser is AAOKH’s science lead and a marine mammal expert. She studies changing Arctic marine ecosystems and focuses on interdisciplinary research. Josh Jones is AAOKH’s research coordinator. His interests are in coastal sea ice dynamics and local and traditional knowledge.

News from the AAOKH steering group

AAOKH is guided by a volunteer science steering group composed of local Indigenous advisors from coastal communities and University of Alaska Fairbanks scientists. The group ensures that AAOKH provides useful tools and resources for northern Alaska coastal communities to share their expertise related to changes in the seasonal cycle.

The steering group met spring 2019 in Fairbanks. Looking forward, the group agreed to focus on increased visibility and participation in coastal communities especially through education opportunities. Since many changes are occurring in the Bering and Chukchi Sea regions, there was also interest in expanding the observing network to capture changes as they move northward.

AAOKH steering group

- Austin Ahmasuk, Nome
- Lee Kayotuk, Kaktovik
- Noah Naylor, Kotzebue
- Qaiyaan Harcharek, Utqiagvik
- Hajo Eicken, UAF
- Scott Rupp, UAF
- Sean Topkok, UAF
- Terry Chapin, UAF
- Todd Brinkman, UAF

Education

AAOKH’s education opportunities

Community members across the AAOKH network indicated that they wanted their children involved in observing Arctic change. AAOKH gives students and educators the tools and training to study the environment around them. Our education lead, Elena Bautista Sparrow, coordinates with groups that already exist in the community to complement what is already in place.

If you are an educator or college professor in an AAOKH community, contact us to learn how students can collect data, participate in field trips or use coastal data in science curriculum to meet education standards.

Flying science kites

Did you know, kites can be used to monitor changes to coastlines and sea ice? AAOKH attaches cameras and science instruments to study kites. This allows us to photograph larger areas from the sky. Flown over the same site repeatedly, we can see how the ice and landscape change through the seasons, and how air temperature and wind change at different heights.

We hope to get these kites into classrooms across the AAOKH network so that students can safely monitor sea ice. This year, AAOKH scientists demoed the kites at Utqiagvik’s middle school sea ice field day and the Barrow Arctic Research Center science days.

Observing clouds

AAOKH scientists also visited Kaktovik to participate in an all-ages community meeting and worked with classes during their youth science event. Students flew kites and also learned how making regular cloud observations can help scientists and communities better understand weather and climate.
Coastal observers

AAOKH welcomed four new observers in 2019. Bobby and Vince Schaeffer, have been making observations and gathering ocean measurements in Kotzebue. In October, Guy Omnik began as an observer for Point Hope and Carla SimsKayotuk joined AAOKH from Kaktovik. Active observers are also in Wainwright, Utqiagvik and seasonally in Wales.

Welcome new observers!

Arctic observers
Bobby Schaeffer, Kotzebue
Billy Adams, Utqiagvik
Carla SimsKayotuk, Kaktovik
Guy Omnik, Point Hope
Joe Mello Leavitt, Utqiagvik
Robert Tokeinna Jr, Wales
Steven Patkotak, Wainwright
Vince Schaeffer, Kotzebue

You can get involved in many ways!

There are many ways to get involved in AAOKH. Whether you are a community member, local expert, teacher or student we need your help documenting the changing seasonal cycle in your community.

Keep up to speed on AAOKH observations, findings, activities and events by connecting with us online or by phone!

arctic-aok.org

dhauser2@alaska.edu

907 474 1553

@ArcticAOK