



Alaska Arctic Observatory & Knowledge Hub

Community-based observations of change

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 local expertise and observations of environmental change. Community-based observations focus on changes in sea ice, wildlife and coastal waters.

Also a knowledge hub for sharing data, AAOKH has three main goals:

- Share and document community observations about changes to the seasonal cycle
- Make wildlife, ocean data and information from scientists accessible to communities
- Provide resources for education and outreach

Community-based observations

Six local observers currently gather observations in and around five northern Alaska communities. The observations 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, AAOKH observers have shared over 4,000 community-based observations. These are combined with the historic Seasonal Ice Zone Observing Network database (2006–2016) of over 9,000 observations.

Education and outreach

AAOKH gives students and educators across northern Alaska the tools and training to study the environment around them. Our scientists have worked with classrooms in several communities, for

example, equipping students with camera kites to monitor coastline changes. AAOKH also supports UAF graduate and undergraduate student research including two students from Utqiagvik and another from Bethel. Each student works with AAOKH observations and is interested in promoting Indigenous Knowledge in marine science.

AAOKH history

AAOKH is part of the University of Alaska Fairbanks Troth Yeddha' Campus, on the traditional lands of the Tanana Dene People. We are part of the International Arctic Research Center. AAOKH is made possible through Community Service Payments made by a corporate defendant that was convicted of federal environmental and maritime crimes in 2014.



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What do the observations say?



Close-to-normal spring conditions



Successful spring and fall whaling



Close-to-normal summer ocean conditions



Successful harvesting activities



More typical wildlife behavior



Delayed fall freeze-up



Tikiġaq
Point Hope

Qikiqtaġruk
Kotzebue



Tikiġaq (Point Hope)

Guy Omnik, AAOKH observer

April 24 My captains Russell and Andrea Lane caught the first whale in Point Hope [31 feet 10 inches]. I harpooned the whale on April 22.

May 9 Point Hope caught its 12th whale.



April 2020, Guy Omnik



Qikiqtaġruk (Kotzebue)

Bobby Schaeffer, AAOKH observer

June 25 This Spring was a little like the springs of old... [Sea ice] got to three feet thick and stayed that way the whole winter... it extended our hunting season and hunter success was excellent. And, the *ugruk* [bearded seal] had nice thick blubber!

July 10 The salmon are here but not in large numbers... Local folks are still catching red king crab and in good numbers so they are keeping their pots out longer as the cool temperatures have not heated the water in the Kotzebue Sound like it did last year...



Wainwright

Steven Patkotak, AAOKH observer

October 15 Late freeze up at lagoon and ocean—a month late for freezing and snowing.

October 29 Regularly snowing here but no continuous subzero cold at night hours.

November 3 New ice and slush but slow freeze up in Chukchi again.



Utqiagvik

Joe Leavitt & Billy Adams, AAOKH observers



September 13 Huge swells on the ocean, six foot [waves], no ice on the ocean, tundra is very wet. Whalers still have two whales to go... No small whales taken this fall, smallest was about 34 feet.

September 30 The easterly winds are back and the ocean water, was very brown, is clearing. For the past few years we experienced more west or south winds from early August into October that moved the water around and moved away small ocean life such as krill and other plankton-like critters. This changed some patterns in migratory animals like bowhead whales, which we as Iñupiat have depended on and continue to use for food. There was uneasiness from this as we had to travel much further in these past few years, many dangers and long hours, many days out at sea. The conditions this fall, beginning from August, has come back to normal-like season meaning that the bowheads, other animals like ringed seals, and seabirds have gotten closer to shore to feed on what they need as well as the Indigenous Iñupiat.



Kaktovik

Carla SimsKayotuk, AAOKH observer

October 9 Not much snow and the ponds and lakes keep melting.

October 15 Lots of slush on the ocean side and the lagoon and channels are iced over with a few spots open. The polar bears are walking and playing on the ice.

October 21 Lots of young ice on the ocean. Some areas are already forming pressure ridges. Yesterday I counted 27 bears with the majority of them being sows with young cubs.

October 24 Too warm, too much open water and not enough snow.



October 2020, Carla SimsKayotuk

Mapping whaling trails at Utqiagvik

Each spring AAOKH maps trails across the shorefast ice used by Utqiagvik whalers to access the ice edge during hunting. Whalers use the maps in three ways:

1. See what type of ice (flat ice, rubble ice or unsafe thin sections) to expect before traveling over the sea ice.
2. Learn where other crews are located and direct community members to whale harvest locations.
3. As a resource during search and rescue efforts.

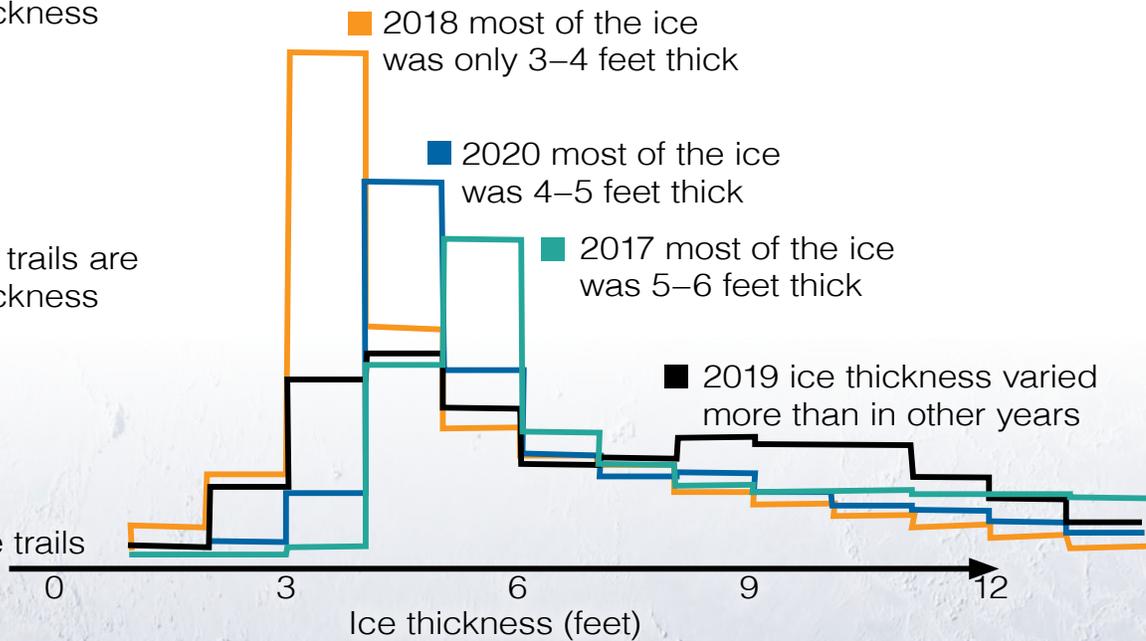
These trail maps have been created since 2007 and now provide a longterm record of spring sea ice thickness and ice edge location at Utqiagvik. Compare the ice thickness on the trails during the past four years using the graph below.

In 2020, AAOKH scientists Josh Jones and Matt Druckenmiller were unable to travel to Utqiagvik because of COVID-19, so AAOKH's local partner Craig George from the North Slope Borough Department of Wildlife Management mapped the trails.

40% of the trails are a given thickness

20% of the trails are a given thickness

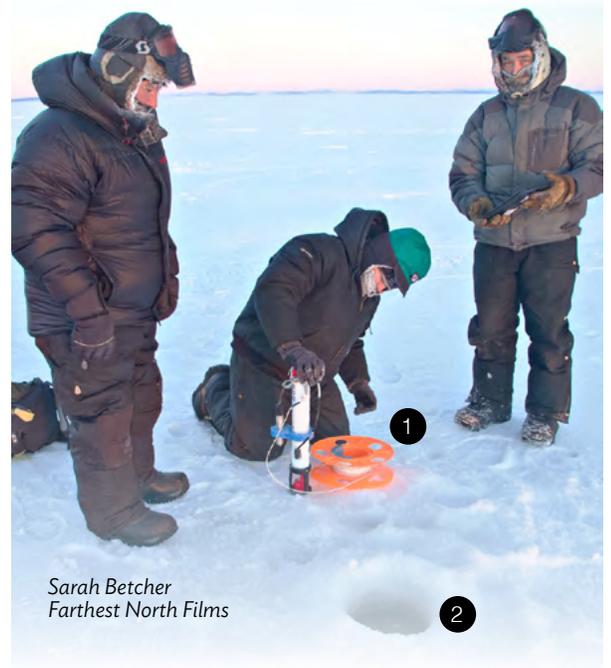
none of the trails



Salinity and breakup

These graphics are known as water profiles. They are created based on numerous water samples gathered by AAOKH observers in Qikiqtaġruk (Kotzebue) and Wainwright in spring 2020. These profiles help us understand the timing of breakup by showing how the salinity of the ocean changes as the sea ice and nearby rivers break up in spring.

- 1 A science instrument called a CTD sensor is used by the AAOKH observers to sample the water. The sensor measures the temperature and salinity from the surface of the ocean down to the seafloor.
- 2 In winter the CTD sensor is lowered through a hole in the ice or off the edge of the shorefast ice.



Sarah Betcher
Farthest North Films

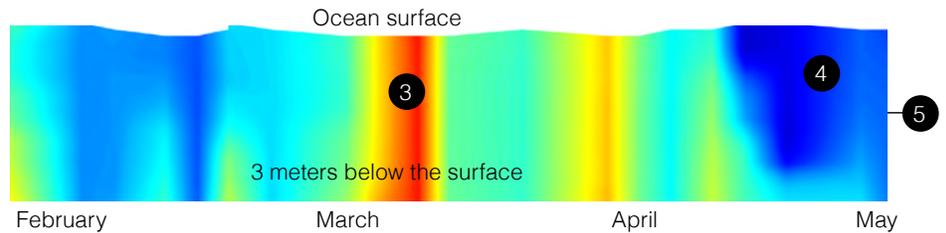
Qikiqtaġruk (Kotzebue)

Water sampled by Vincent Schaeffer in Kotzebue Sound was often much fresher than seawater, likely because the Noatak, Kobuk and Selawik rivers flow into the enclosed sound.

- 3 While there was still ice cover, salty water entered Kotzebue Sound likely from the Bering Sea pushed by strong 20+ mph winds on March 17–20.
- 4 Lots of fresh water entered the sound, likely from the Noatak, Kobuk and Selawik rivers as they broke up.
- 5 Kotzebue Sound broke up on May 25.

What do the colors mean?

Less salty More salty



Wainwright

Steven Patkotak took the water samples at Wainwright in an area exposed to the open ocean. The water samples were much saltier until just before breakup.

- 6 As the ice started to melt, fresh water formed a thin lens just below the sea ice.
- 7 A deep layer of fresh water formed, likely from the Kuk River as it broke up.
- 8 Sea ice break up occurred on July 1.

