

AAOKH NEWS

Issue 10, Winter 2024

Alaska Arctic Observatory and Knowledge Hub



Fall Colors in Kotzebue

AAOKH researchers were part of a team that visited Kotzebue in September 2023 as fall colors and clouds crept across the tundra.

AAOKH history

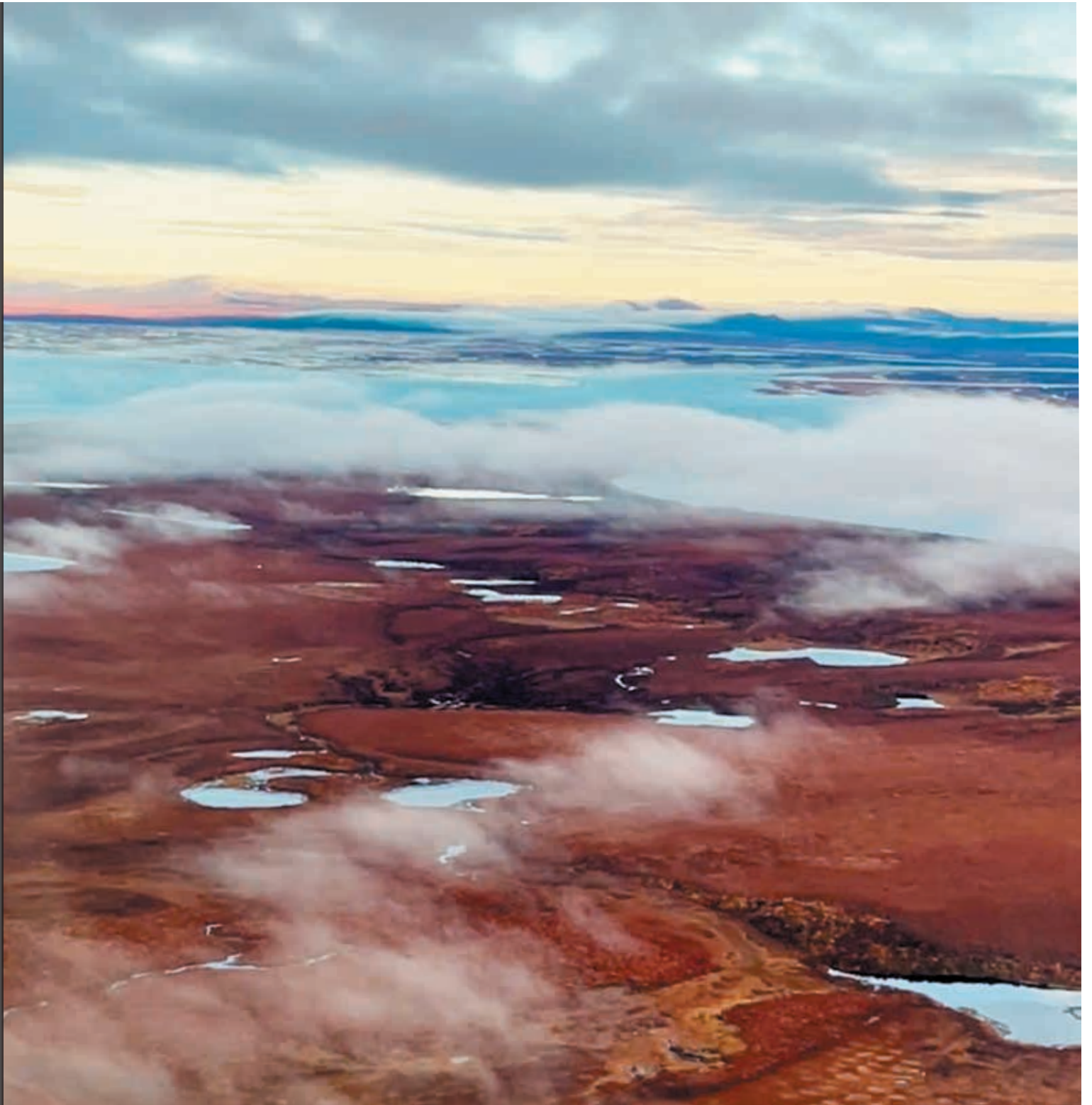
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International Arctic Research Center



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Paġlagivsi! AAOKH aitchuutsuurat qanuq Inupiat uqausigigai qanuq siġa allanġuqtuq.

In English: Welcome! AAOKH shares how Inupiat observers describe rapid environmental changes. Inupiaq translation by AAOKH program coordinator Roberta Tuurraq Glenn.

In this issue:

- Identifying local needs for sea ice forecasts (p.8)
- Knowledge exchange with partners across the Arctic (p.10)
- *Natchiq Grows Up* is published (p.11)
- AAOKH perspectives in the Arctic Report Card (p.11)
- Vessel traffic in the Arctic increases (p.12)

Postal Customer

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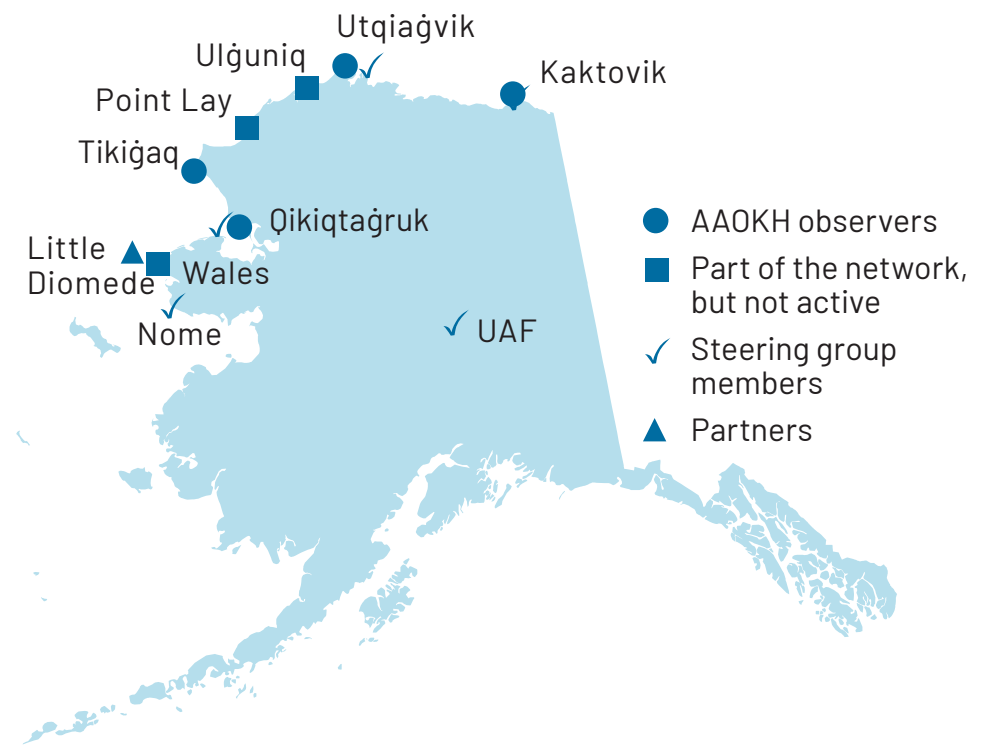
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Who are we?

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. Observations focus on changes in sea ice, wildlife and coastal waters.

AAOKH activities focus on these goals:

1. Support local Indigenous observers as they share their knowledge and document changes.
2. Provide services to monitor environmental change and meet community needs.
3. Create educational opportunities for the next generation of Indigenous leaders.



5 observers

AAOKH has five active observers in four coastal Arctic communities. They document the changing seasonal cycle. Observers: Billy Adams and Joe Leavitt, Utqiagvik; Bobby Schaeffer, Qikiqtaġruk (Kotzebue); Carla SimsKayotuk, Kaktovik; Guy Omnik, Tikiġaq (Point Hope).

7 researchers

AAOKH's science team puts local observations in the context of scientific measurements related to ice, ocean conditions, and marine mammals. Scientists: Donna Hauser, Josh Jones, Roberta Tuurraq Glenn, Alexandra (Alex) Ravelo, Rick Thoman Jr., Krista Heeringa, Matthew Druckenmiller, Elena Sparrow, Hajo Eicken.

Steering group

AAOKH is guided by a steering group of local Indigenous advisors and University of Alaska Fairbanks scientists: Austin Ahmasuk (Nome), Lee Kayotuk (Kaktovik), Noah Naylor (Qikiqtaġruk), Qaiyaan Harcharek (Utqiagvik); from UAF, Hajo Eicken, Scott Rupp, Sean Asiġuġ Topkok, Terry Chapin, Todd Brinkman.

Students

Elizabeth Mik'aq Lindley is seeking a doctoral degree.
Kimberly Kivvaq Pikok is seeking a master's degree.

In August 2023, the AAOKH Steering Group met in Fairbanks to share updates on what observers have been seeing and experiencing in their communities and what UAF researchers have learned. (Photo courtesy Donna Hauser.)



Researcher corner

Postdoctoral fellow Alexandra Ravelo has been working with AAOKH since 2022 on a breadth of projects that intersect community and climate. Two recent projects target ways to improve use of the AAOKH database and ways that climate is impacting communities directly.

AAOKH Database Use

Ravelo is examining the AAOKH database of stored observations and making recommendations to increase the usability and accessibility of the information.

Climate Impacts on Kotzebue

Ravelo is looking at how large shifts in environmental conditions in Kotzebue Sound affect the animals and humans that depend on them. AAOKH observer Bobby Schaeffer has worked with Ravelo to help her understand these community impacts.

In 2019, for example, Ravelo found that water temperatures in Kotzebue Sound were 5°C warmer in summer and stayed warm all winter, with almost no sea ice. Observations by Bobby Schaeffer (below) confirm that the conditions Ravelo documented in 2019 were extreme, with impacts on hunting and food security.

"As a scientist I was trained to use the scientific method to answer questions. Now working with the observations from the AAOKH team, I am learning about the impacts of climate change to coastal communities in a whole new way," says Ravelo. "When Bobby describes processes that take place in Kotzebue, it all comes together: the physical environment, the timing of harvests, the impacts of weather and how everything is interconnected."

Alex hopes to continue working with Indigenous Knowledge holders and finding ways to help inform communities about climate change impacts.



TOP Bobby Schaeffer and Alex Ravelo review past oceanographic data after retrieving the Conductivity, Temperature and Depth (CTD) instrument from under the ice in early May 2023.

BOTTOM The AAOKH team (from left to right: Alex Ravelo, Roberta Glenn, Joshua Jones, and Bobby Schaeffer) retrieve the CTD Instrument from under the Kotzebue ice in May 2023.

(Photos courtesy Alex Ravelo.)

Changing subsistence calendars

"I hunt the ocean from March through November. We usually hunt seal when the days get longer in March if the ice is available and safe.

I also fish the ocean [for crab by cutting holes in the ice to set pots] starting when the days get longer in March. There too, it all depends on safe ice in the crabbing areas.

Ugruk [bearded seal] hunting starts when the Kotzebue Sound ice breaks up in May and runs through June. When the sea ice is gone, we go and set crab pots usually in mid to late June.

We crab until the Kotzebue Sound warms and desalts [Noatak and Kobuk River fresh water inundates the Sound] which forces the crab to leave the Sound usually in mid to late July.

All these events are dependent on air and water temperatures during the months we subsist on these resources. Air and water temperatures determine the availability of sea ice. This is critical during early Spring seal hunting and crabbing.

With climate change, there are no certainties and planning subsistence [activities] in our ocean is getting to be quite a challenge."

—Bobby Schaeffer in Kotzebue

Tusaayugaat

Recent observations

1 • Qikiqtagruk

Bobby Schaeffer, AAOKH observer in Kotzebue

Warm summer

June 28 ► *Ugruk* [bearded seal] hunting season is now over. I observed some of the animals taken by hunters. Most had below average blubber. My daughter worked on three and said one large *ugruk* had only one inch of blubber. We store dried *ugruk* meat in the oil that is naturally rendered and when the *ugruk* is lean, it is hard to store all the dried meat.

July 12 ► Summer is now here. The weather is quite warm today but, it is the calm before the next rain. Yesterday, I helped scientists launch a mooring near the Mouth of the Noatak. This mooring measures algae growth in the water. This instrument will collect data for the summer.

High water from rain and storm surge

September 1 ► Our fall storms seem to be on schedule. Strong West winds will bring in a surge of water along with high surf which is expected to crest above the high water mark on beaches facing the west. Rain will accompany this storm as well.

September 27 ► After a three day calm and sunny summer weather spree, the clouds returned as a trail of low pressures make their way up to the Bering Sea. Rain-snow mix is expected at times.

Unpredictable weather

October 4 ► First dusting of snow yesterday. Fall is upon us. Seals are piling up in great numbers in front of Kotzebue as our fall herring run is now in full swing. Since it is now cold, hunters will be going out to harvest fat fall seals. The freezing temperatures will keep the meat from spoiling.

October 23 ► The weather has been the most unpredictable event in NW Alaska these past two weeks. The Kobuk Lake froze over on October 11. Folks were able to walk on the ice and fish for cod. All the ice in front of Kotzebue is now gone.

November 7 ► The weather has been quite challenging. It started freezing at the end of October but low pressures have been keeping the air quite warm. Locals have been following the frozen lakes and land to go to their favorite fishing spots to fish for tom cod.

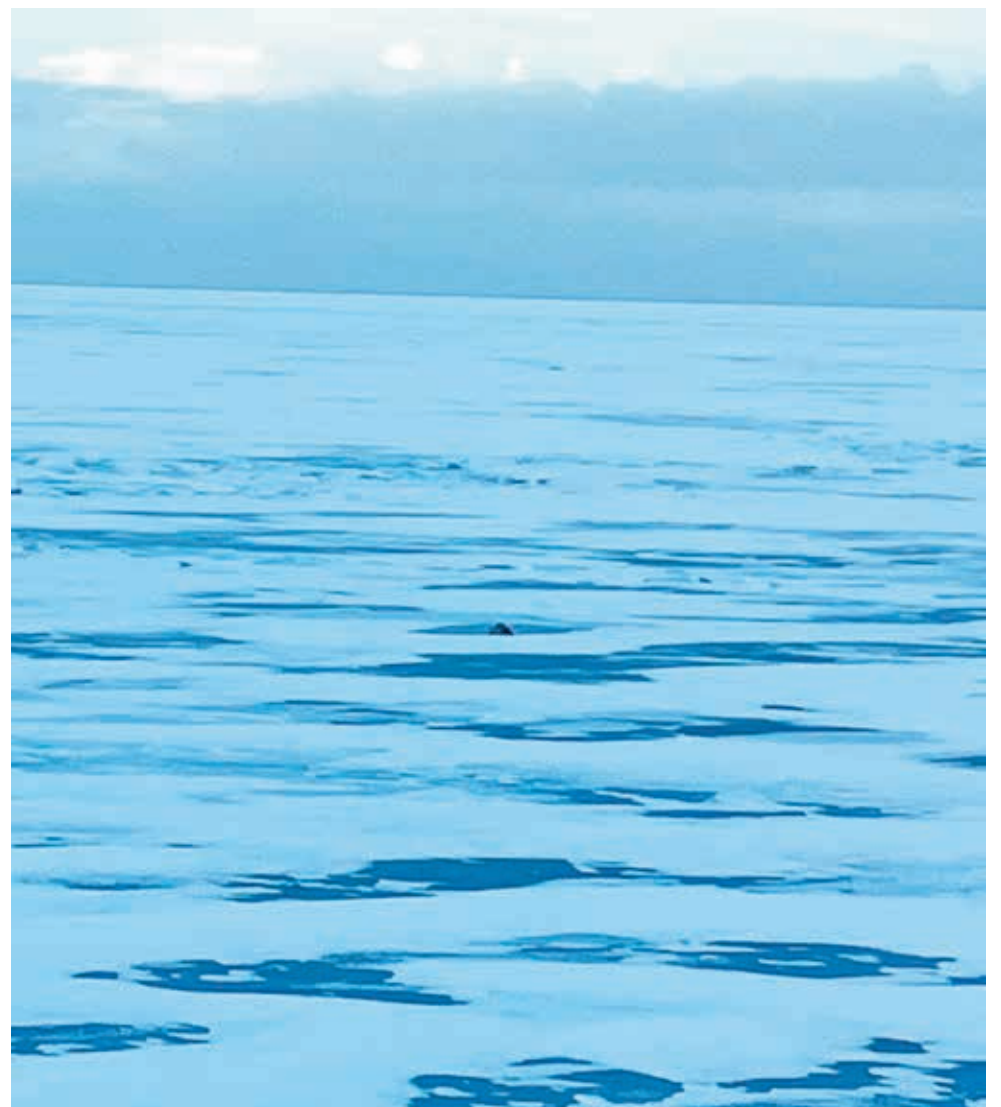
"Nov 14 and Still Open Water"

"The weather has taken center stage the past week. A series of low pressures made their way through the Bering Sea and pounded the west coast of Alaska again. Kotzebue experienced winds South East to 44 mph with gusts to 66 mph Monday morning with heavy snowfall. This caused a storm surge on all West facing coast beaches."

—Bobby Schaeffer

"With record snow falls last winter, we knew this would be a banner year for berries. Sure enough the *akpiks* [salmonberries] were thick all over the place."

—Bobby Schaeffer



November 14 photos showing open water in Kotzebue Sound. (Photo courtesy Bobby Schaeffer.)

2 • Tikigaaq

Guy Omnik, AAOKH observer in Point Hope

Successful spring whaling

June 9 ▶ North 10 mph 45°F mostly clear skies. The ice on the south beach still hasn't blown out. The ice on the north beach is off the beach in some places but with recent north winds, the ice is packed in now. With two days left until *qagruq* [whaling feast] the successful whaling captains, their wives and crew members are busy preparing/sewing for the three-day whaling feast held in Point Hope June 11, 12 and 13.

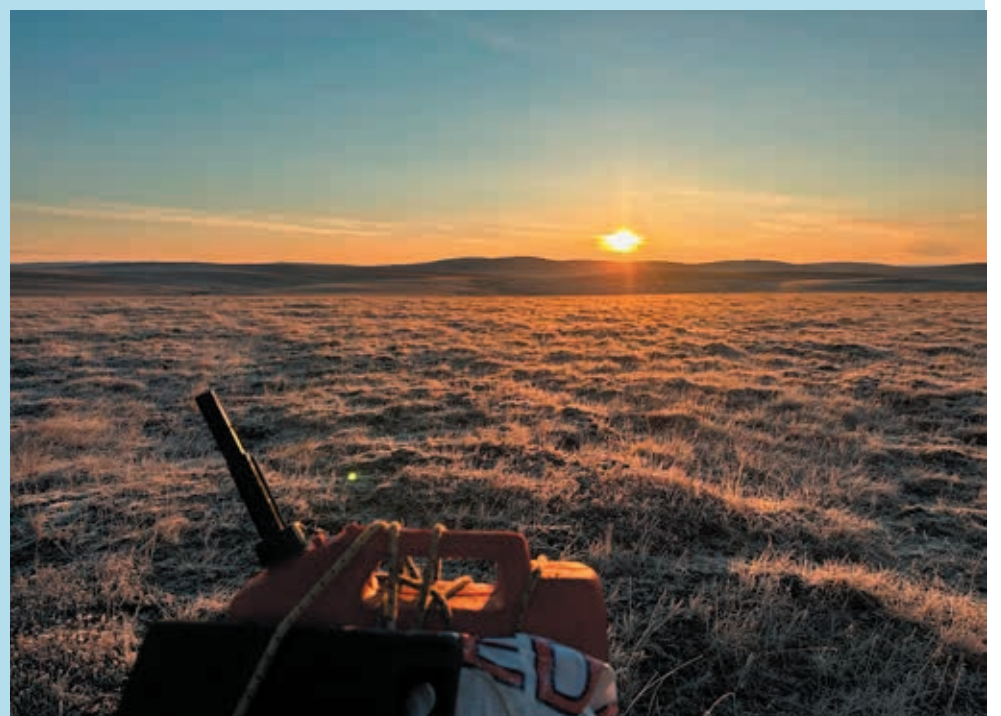
August 22 ▶ North winds 25-30 mph and mostly cloudy.

Wildlife everywhere

August 24 ▶ Good evening. Just got back from a two day hunt. Seen a bit of everything this trip: one wolf, lot of bears, musk ox, sheep, few caribou, and walrus.

September 16 ▶ Good morning. 44°F and mostly cloudy with some rain. Fall colors.

September 22 ▶ Went on a hunting trip north of Point Hope. 54°F mostly clear north at 10 mph.



TOP Hunting trip north of Point Hope on July 25. 54°F mostly clear north at 10 mph.

MIDDLE A wolf spotted amongst a dusting of snow in August.

BOTTOM September 22 hunting trip North of Point Hope.

(Photos courtesy Guy Omnik.)

3 • Utqiagvik

Billy Adams/ Joe Leavitt, AAOKH observers

Ice keeps the animals near town

June 12 ► Low tide, pressure ridges look like they have sunk. Total of five blanket toss festivals this year. Lots of bird watchers in to town yesterday.

June 20 ► Ice far as you can see, seals seen near town.

June 21 ► It is 34°F, light snow, and westerly winds 10 to 15 mph. With the westerly winds bears are opportunistic to come to the land fast ice and to the shore.

June 27 ► Seals hauling out and basking in the sun to shed their winter coats as all things become new. The seals are looking more robust and healthy.

June 30 ► Shorefast ice breakup even more, towards the south west. About 3 miles from town is nearly open to the beach.

July 8 ► Boaters hunting seals. A herd of caribou came close to the east. Hunters get fresh meat, but are getting seal and walrus until caribou get fatter.



Warm and windy fall weather

September 1 ► First frost of September this morning. August was very warm for the first couple weeks then wet through the end of the month.

September 16 ► A massive bear in a cabin, it has been wet with 35° to 40°F temperatures and very windy a period of time now. Please be aware on the North Slope as it is getting darker outdoors.

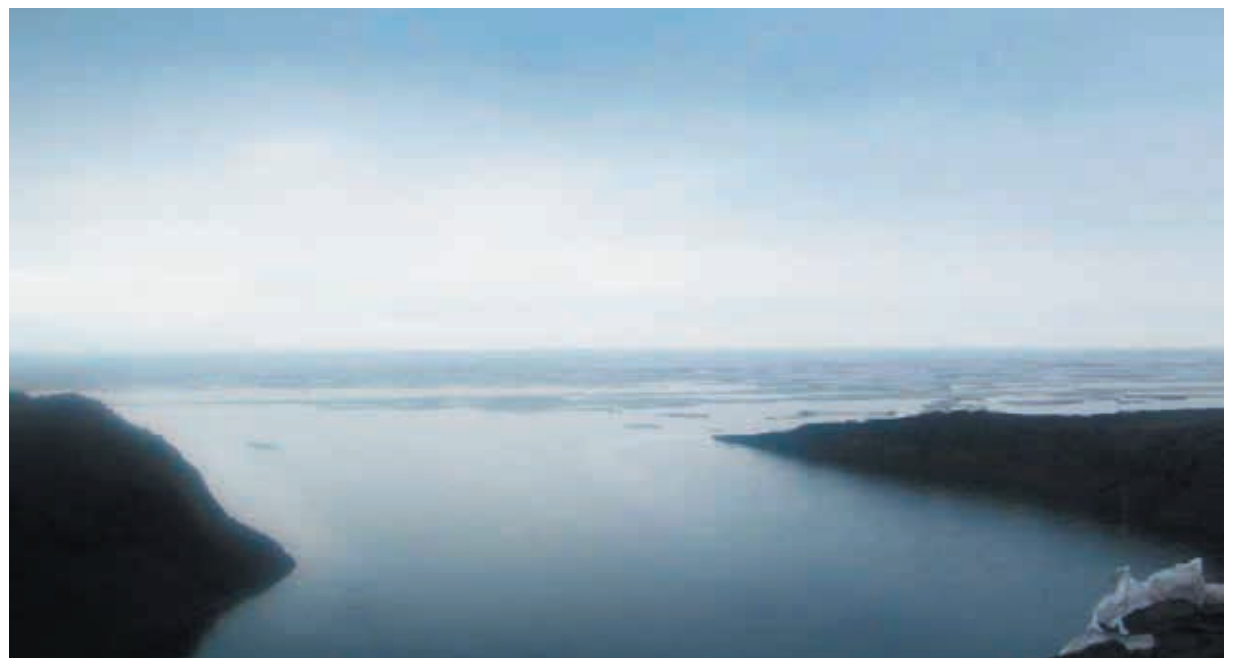
September 25 ► Calm winds. No freezing. Caribou on the rivers. Someone got 91 fish on his net at half moon three.

October 7 ► First day for fall whale hunt. Boats go out but choppy waters, need a calm day for whales.

October 16 ► The snow has been fluffy soft and consistent, we call this *ugsrualaqiruaq silla*. A sign that great whales are near and soon the Creator will Bless the whalers. The facts that we were taught about these words and meanings have been passed on through time.

October 31 ► The bowheads have been reported to be seen in the last few days. Caribou and fish are the focus for harvest. Animals have been healthy as the month of October has been generous providing Utqiagvik and other communities with whales. The snow has been heavy and moist our elders continue to urge everyone to take caution when traveling and hunting near lakes as snow.

November 13 ► *Qinnu* [slush ice] is being formed as temperatures come down.



TOP A *nanuq* [polar bear] near town on June 22. Many bears near town in late June.

MIDDLE June 27 haul out of healthy-looking seals.

BOTTOM June 28 open water.

(Photos courtesy Billy Adams.)

3
Utqiagvik

4 • Kaktovik

Carla SimsKayotuk, AAOKH observer

June is warm and windy

June 5 ► Beautiful sunny day. The creeks are overflowing. Still have snow on the island although it is melting. Roads still flooding due to run off, and culverts still not opening.

June 13 ► Another nice day, warmer wind. A *nanuq* [polar bear] visiting the island again. More and more flowers are popping out. Hunters gathering geese eggs.

June 26 ► Another nice day with the sun shining. Lots of open water. A couple boats went out. The first Arctic Char and *tuttu* [caribou] of the summer were caught yesterday.

July brings rain and fog

July 1 ► All week it has been a mixture of fog and sunny windy days. The ice is all broken away but is hanging just off shore. People are fishing with rod n reels. A char here and there. Mosquitoes came out in full force last night.

July 26 ► No planes for a couple days and it finally cleared up enough for the planes to make it in. A couple hundred caribou right on the beach to the west but boaters unable to make it over due to winds and rough ocean.

August is full of transitions

August 12 ► Another wet foggy day. Yesterday it cleared up in the afternoon long enough for some planes to make it in. Our first planes in five days. The ocean has small rollers today. Not much fish is being caught.

August 18 ► The geese are back especially the snow geese. People are seeing the bowhead blowers out in the distance. Turning out to be a beautiful calm night. School has started back up.

September brings whales

September 18 ► It calmed down enough for the whalers to go and harvest a bowhead. No mail plane again. We have over 20 polar bears hanging around the island.

September 20 ► Wow, we have the sun shining down on us today. It feels so good to see and feel the sun. The whalers are out towing a whale in.

October blizzard and late freeze-up

October 15 ► Windy clear day. The ocean is rough with white caps. Lagoon and channels are part frozen along with the lake.

October 24 ► We had our first blizzard over the weekend. The ocean ice came in. A hunter went up to hunt sheep and didn't see any but hundreds of caribou but fell through the ice with his machine so he is heading home to wait for the rivers to freeze more.



TOP Flowers popping up June 13 in Kaktovik.

BOTTOM Cleaning up a bowhead whale harvested on September 18.

(Photos courtesy Carla SimsKayotuk)

Forecasting guidance



AAOKH works with UAF and the National Weather Service to Identify Community Needs

AAOKH has partnered with colleagues at UAF's AK Center for Climate Assessment and Policy (ACCAP) to provide guidance for the National Weather Service (NWS) to improve the weather and sea ice information communicated to coastal communities in Alaska.

First, a team of AAOKH, NWS, and ACCAP researchers visited Kotzebue and Utqiagvik in September 2023 to talk with Elders, hunters and whaling captains, search and rescue experts, Tribal leaders, researchers, and borough staff. The team wanted to learn what weather and sea ice predictions are most useful for people—and how to get this information to them.

In both Kotzebue and Utqiagvik, the team learned that wind speed and wind direction, for example, are important for communities to predict sea ice safety.

Interviewees also discussed travel safety during overflow events and how-and-where people get weather



The AAOKH and ACCAP team of Roberta Glenn, Nathan Kettle, and Donna Hauser visited Kotzebue along with NWS scientists in September 2023 to interview local people about what sea ice information is most useful to them. (Photos courtesy of AAOKH.)

information. In Utqiagvik, there was an emphasis on the value of local NWS representation. With this and other guidance, the NWS can provide more useful weather and sea ice information services.

Follow-up visits to Kotzebue and Utqiagvik to confirm and share results—and discuss opportunities for the NWS to develop prediction products—are expected to happen in early 2024.

Alaska Communities and Weather Needs

"A lot of the communities depend on the National Weather Service forecasting versus all the hundreds of apps there are out there. So they have that much more trust in it. Even if you are more than 50% [accurate], which is what we see, 50% were better, they're always going to trust that . . . Every hunter that I speak to, they trust more on the National Weather Service forecasting."

—Utqiagvik hunter interviewee

"Every morning, that's what my dad asked me, 'Which way is the wind blowing?' In the wintertime, you got a west wind, beware, stay home, don't go nowhere . . . You go to the southwest, even worse than west wind because the surge starts to come in and they got the same kind of storms as the west wind in the wintertime and extremely dangerous time that southwest wind. Then you got a south wind, it's the same as the southwest, but it doesn't bring in the surge of water waves. South wind brings the high water. As long as it blows from the south wind, the water keeps coming in."

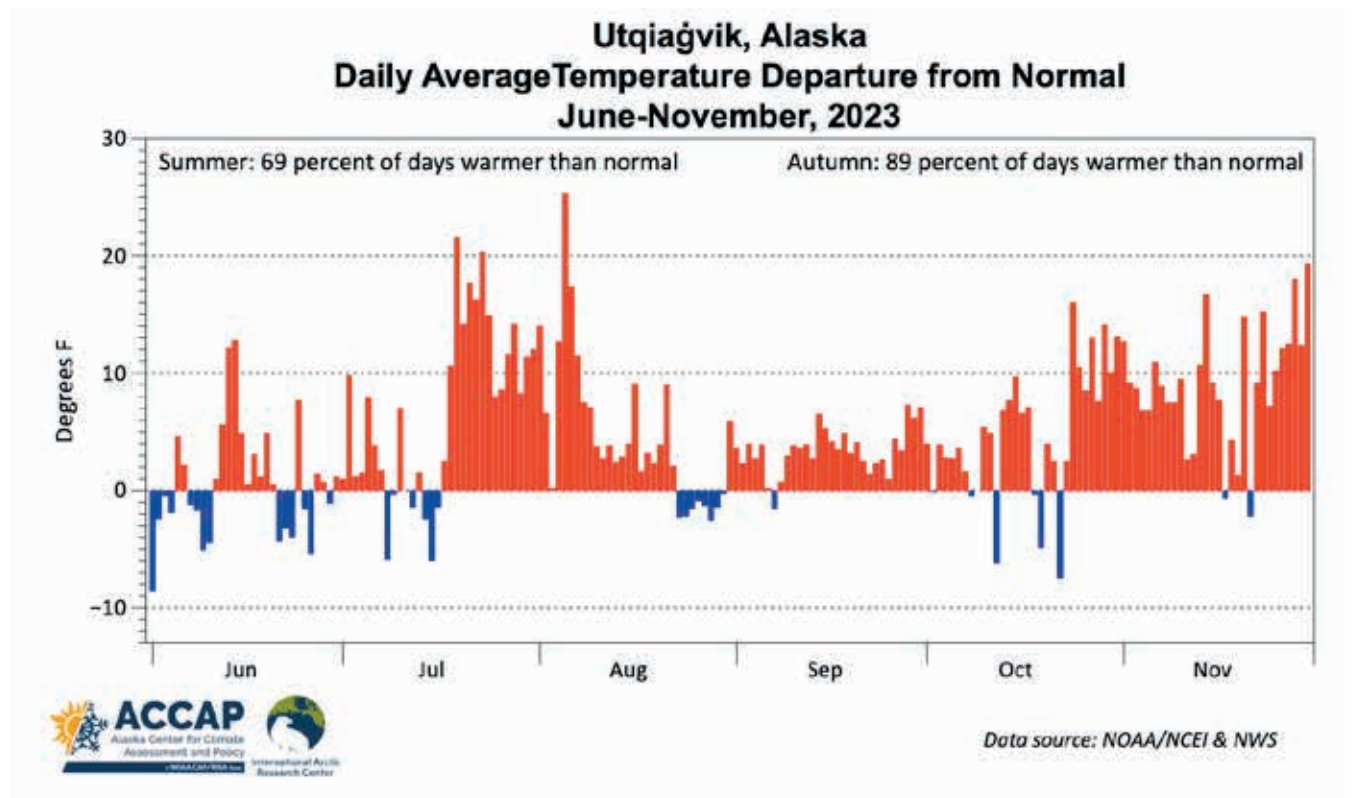
—Kotzebue Elder interviewee

Climate trends

Utqiagvik sees high wind and record warm temps this Summer

Following a record warm summer, Utqiagvik tied for the second warmest autumn in more than a century of climate observations.

- 81 of the 91 days between September 1st and November 30th had a daily average temperature above the 1991-2020 normal.
- Seven of the ten mildest autumns in Utqiagvik climate history have occurred since 2016.
- Loss of nearshore sea ice is a major factor in record warm autumns.
- Sea surface temperatures were well above normal in early autumn and ice-over of the Beaufort Sea did not occur until mid-November.
- Every day between November 4th and 10th had an average wind speed over 20 mph, the longest such streak of strong winds since April 2016.
- On November 9th the average wind speed at the Airport clocked in at 34.5 mph, the windiest November day in more than 20 years and the windiest calendar day since March 13, 2020.

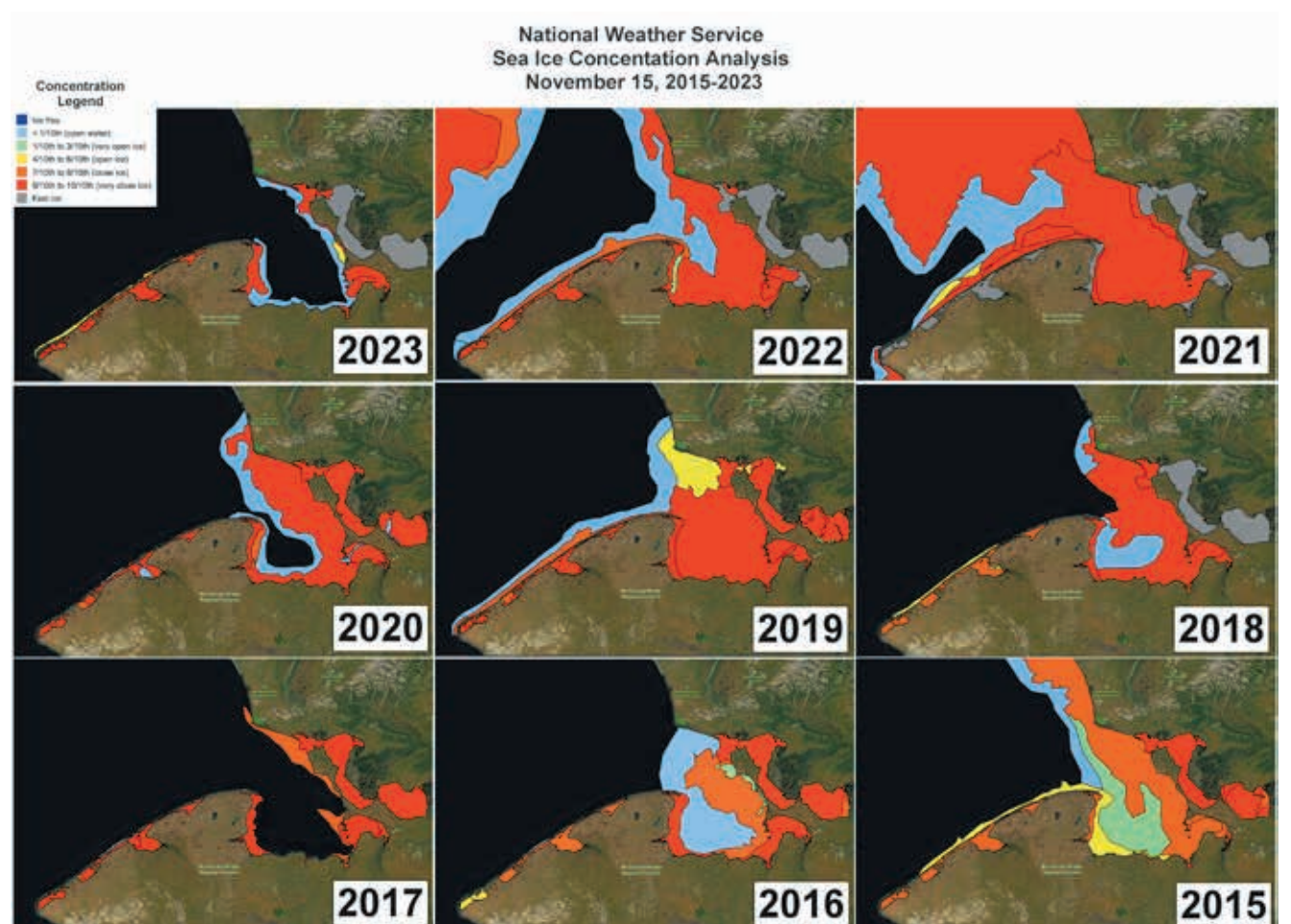


Kotzebue Sound Storms Melt Sea Ice in Autumn

As of mid-November, autumn sea ice in Kotzebue Sound was off to the slowest start since 2017. Although October and November temperatures were somewhat above normal, it was more the timing of storminess that kept ice from growing until late November.

Mild weather and storms the last week in October melted out the sea ice that had formed in mid-October. The ice started to form again in early November as conditions changed, but then mid-November storminess caused what little ice had formed to melt back.

This autumn was an example of how the timing of individual storms can significantly impact early season ice conditions and the limitations of short term climate forecasts.



"With all the rain we've been getting the rivers will rise to near or beyond flood stage. Erosion is imminent. But what scares me is our salmon spawning streams will flood as well. This means most salmon eggs layed prior to the high water may wash away. This will determine our salmon return 4 years from now."

—Bobby Schaeffer in Kotzebue

Knowledge Exchanges



We Appreciate our AAOKH Team!

- 16 years of observing by Joe Mello Leavitt
- 9 years of observing by Billy Adams
- 5 years of observing by Guy Omnik, Bobby Schaeffer, and Carla SimsKayotuk
- 7 years of service by our steering group members: Austin Ahmasuk (Nome), Lee Kayotuk (Kaktovik), Noah Naylor (Kotzebue), Qaiyaan Harcharek (Utqiagvik), and Hajo Eicken, Scott Rupp, Sean Topkok, Terry Chapin, Todd Brinkman (UAF)



Exchanging Knowledge Across the Arctic

AAOKH partners with the Exchange for Local Observations and Knowledge of the Arctic (ELOKA), which has stored the more-than-10,000 AAOKH observations in a database since 2006.

In August 2023, ELOKA partners (including AAOKH) met for four days at UAF. Partners traveled from different regions in Alaska, British Columbia, Labrador, and Finland to share perspectives related to Arctic observing, cultural place name documentation, observations, and data management.

At this meeting, AAOKH observers shared their interests in connecting with other Indigenous knowledge-holders from across the Arctic and the importance of sharing their knowledge with younger generations.

TOP AAOKH observers Bobby Schaeffer, Joe Mello Leavitt, and Billy Adams (left to right) speak on a panel about observing Arctic change at the ELOKA meeting in August 2023 at UAF. (Photos this page courtesy of ELOKA.)

MIDDLE Joe Mello Leavitt contributes to a facilitated activity at the ELOKA meeting in August 2023.

BOTTOM Joe Mello Leavitt and Billy Adams at the ELOKA meeting.

Observers share at a Steering Group Meeting

"It's good to see the snow on the tundra, that was good for the sheep hunters last October and November. We had a caribou herd that stayed on the island which doesn't normally happen here. It seems like the rivers were late to break up. Fishing has been real slow this summer, we hardly got any char. Big herd of caribou were seen like a month ago [in July] but people couldn't get out because of high winds, so people have been getting them here and there, but not much."

—Carla SimsKayotuk, Kaktovik

New children's book

Natchiq Grows Up

This new children's book follows Natchiq, the ringed seal pup, as she grows up in northern Alaska with her mom Siku.

Interwoven with Indigenous Knowledge from Qikiqtagruk Elders Cyrus Harris and John and Pearl Goodwin, Iñupiaq terms, and scientific findings, the book is based on decades of collaborative work to better understand ringed seals.

Since the 1980s, scientists and local people worked together in northern Alaska to understand ringed seal habitat and pupping. The book tells Natchiq's fictional story in a kid-friendly way to explain the real-life ringed-seal science that scientists and local people learned when working together.



Natchiq Grows Up contains illustrations from the life of a growing ringed seal pup. In this example, a pup spends time digging new tunnels and making her home lair larger while her mother is away looking for food. (Illustrations by Heather McFarland.)

Just published in December 2023 by the University Press of Colorado and the University of Alaska Press, *Natchiq Grows Up* is written by AAOKH's Donna Hauser—with Kathy Frost and Alex Whiting—and illustrated by UAF's Heather McFarland. Purchase online (<https://upcolorado.com/university-of-alaska-press/item/6434-natchiq-grows-up>). Free copies will be distributed to youth and schools.

Arctic Report Card

Every year, the National Oceanic and Atmospheric Administration (NOAA) publishes an Arctic Report Card (ARC). Written and reviewed by scientists, the Report is a clear and authoritative snapshot of environmental changes in the Arctic compared to times past.

This year, Roberta Glenn—along with co-authors Donna Hauser, Billy Adams, Bobby Schaeffer, Carla SimsKayotuk, and Guy Omnik—were invited to write an essay about their AAOKH work for the ARC.

"To be invited to write an essay about AAOKH for the Arctic Report Card is a really big deal," says Glenn. "We are excited that our efforts to include Indigenous Knowledge, observations, and perspectives in scientific research and decision-making is working. And might be seen as a success story for the Arctic."



AAOKH Essay Headlines from NOAA's 2023 Arctic Report Card

- AAOKH works with a network of coastal Indigenous observers to document long-term and holistic observations of environmental change and impacts in northern Alaska.
- Recently, Indigenous observers have noted sea ice loss, warmer air and ocean temperatures, changing wind patterns, and increased intensity and frequency of coastal storms that contribute to flooding and erosion.
- Indigenous observers also document local-scale impacts of environmental changes to community and cultural infrastructure, traditional harvests and activities, and travel safety across the land and sea.
- Applying and centering Indigenous perspectives and observations of Arctic change in decision-making can lead to more inclusive, equitable, and community-led responses.

Glenn participated in a press conference in San Francisco on December 12 to highlight the publication of the ARC essay. Read the essay online at arctic.noaa.gov/report-card/. (Photo by Hauser.)

Vessels in the Arctic

On July 26, 2022, Billy Adams shared: "It rained upon us for a couple days in Barrow, then it turned to snow last night 32°F this morning. The plant life grew and bushes have made their way to Cake Eater road where I live. Adventurists have also made it here by sailing." (Photo courtesy Billy Adams.)

Vessel Traffic Increases

Shrinking sea ice coverage over the past 10 years has opened new Arctic routes for sea-going vessels. AAOKH communities are concerned about the potential impacts on sea animals and subsistence activities.

"[We] are concerned about ships," says AAOKH observer Billy Adams. "We are seeing shipping happening year-round, going to Russia. They can be harmful for animals. We don't know what wastes there are. These are things we are observing."

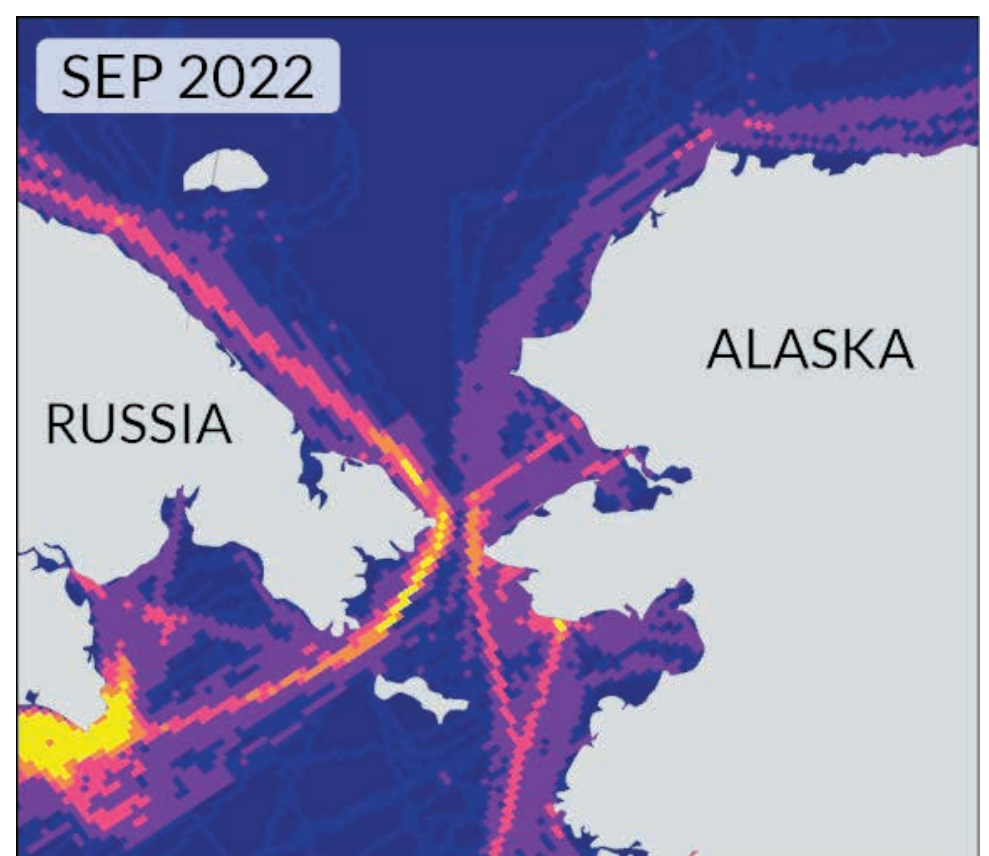
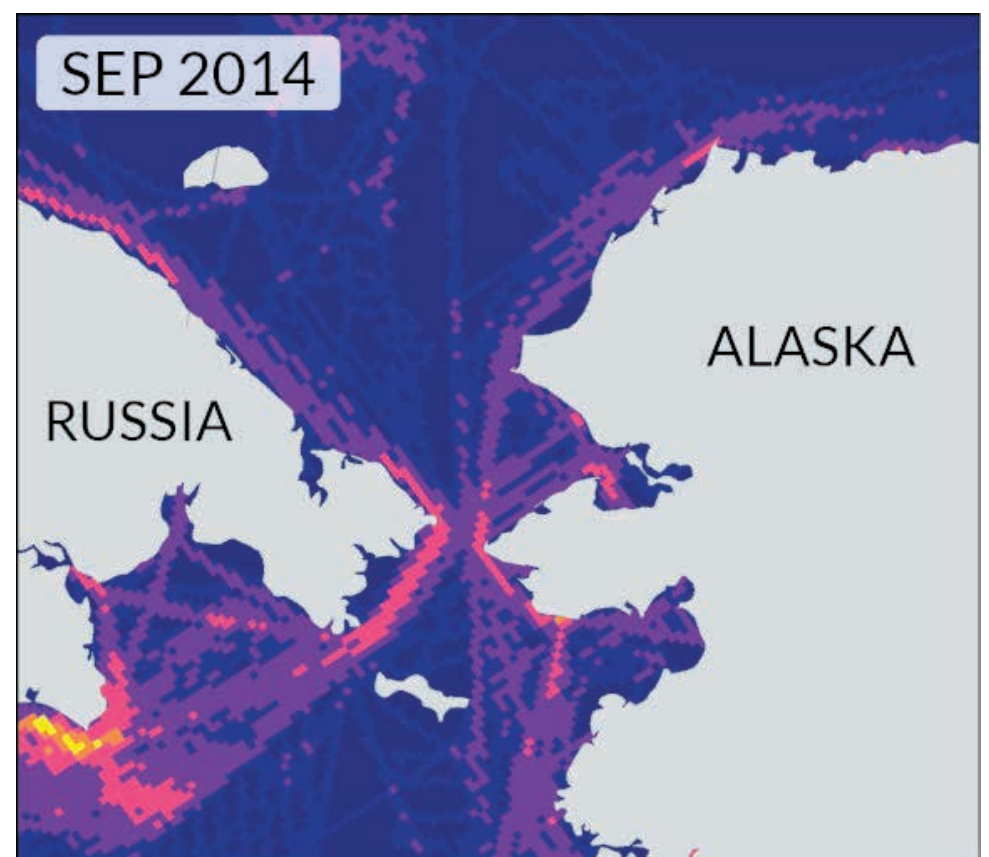
Using vessel location information from 2013-2022 in an Arctic Council working group's Arctic Ship Traffic Database, PhD student Greta Ferloni and AAOKH's Donna Hauser have determined that as sea ice declines, vessel traffic has indeed been increasing.

These example maps compare September vessel transits in 2014 and 2022. The yellow areas show some of the hotspots where vessel activities have increased along the Russian and Alaskan coastlines. On the Alaska side, vessel activities have intensified around Nome and just outside the Kotzebue Sound area. Along the North Slope, the increased vessel transits now also cover a broader area.

Surprisingly, Greta sees vessel activities increasing not just in open water but also in areas of dense sea ice. In particular, vessel activities in pack ice are intensifying along the Russian coast during the winter months; about a third of which is due to icebreakers.

Ferloni, a student at Durham University in the United Kingdom, worked with Hauser for 6 months in 2022 at UAF.

AAOKH is eager to use these vessel data to work collaboratively with communities and Indigenous Knowledge-holders to identify priorities for additional research and planning needs.



NUMBER OF VESSELS

■ 1 - 2 ■ 3 - 10 ■ 11 - 20 ■ 21 - 30 ■ 31 +

Ferloni's maps compare vessel traffic in September of 2014 and 2022. Yellow areas show shipping hotspots, with a monthly average of one ship transit per day.

Watch Ferloni's Presentation on Vessels

Ferloni gave a public seminar in December about her research on vessel traffic. A recording of the talk can be viewed online at <https://uaf-iarc.org/event/cryomobilities-ship-traffic-in-the-icy-waters-of-the-bering-strait-region/>.

What Do You Know about Vessels?

AAOKH is interested in hearing from community members about their vessel traffic concerns. Contact Donna Hauser at dhauser2@alaska.edu