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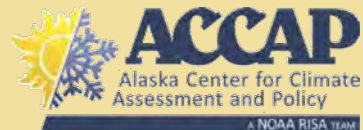
# Delivering Climate Services to Rural Alaska: Challenges and Opportunities

Rick Thoman

Alaska Center for Climate Assessment and Policy (ACCAP)

University of Alaska Fairbanks

17<sup>th</sup> Annual Climate Prediction and Applications Science Workshop  
Charleston, South Carolina, June 11, 2019



# Alaska: The Reality Check

## You can't drive there from here

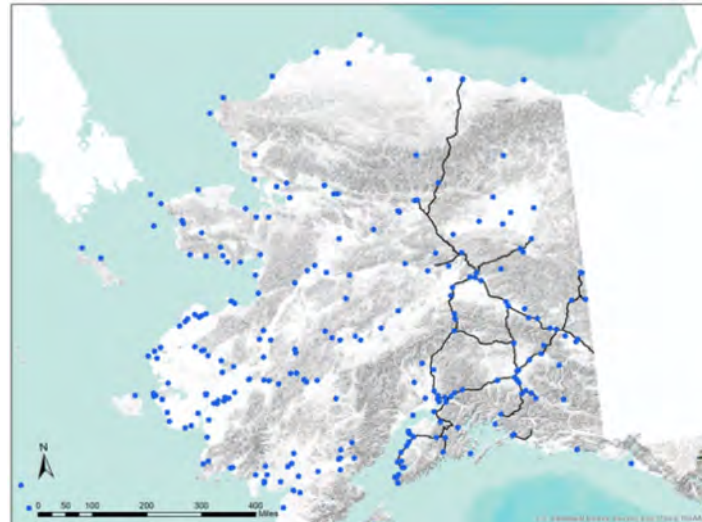
- All-season roads connect only a small fraction of communities
- Air or barge for transportation of goods
- Stand alone water, energy, electrical, waste disposal

## Rural Alaska: Traditions are strong

- Predominately Indigenous
- High dependence on local (wild) foods

## Limited telecommunications

- Generally low bandwidth and unreliable Internet
- Smart phone use very common with younger people



# ACCAP: “Working to improve the ability of Alaskans to respond to a changing climate”

- NOAA/Climate Program Office-funded **Regional Integrated Sciences and Assessments** team for Alaska
- Established in 2006
- Housed within the **International Arctic Research Center** at UAF
- What we do:
  - Multiple Webinar Series
  - Project specific support and research
  - And now...Climate Services Outreach



Dr. Sarah Trainor  
ACCAP Co-Director



Dr. John Walsh  
ACCAP Co-Director



Dr. Nathan Kettle  
ACCAP Co-PI



Tina Buxbaum  
ACCAP Program Manager



# Rural Alaska

## Traditional Media Remains Important

- Statewide Commercial and Public Television
- Regional AM & FM Radio
- Print newspapers



# Traditional products not suitable for many users

Sea Ice Advisory for Western and Arctic Alaskan Coastal Waters

National Weather Service Anchorage Alaska

300 PM AKDT Thursday 04 April 2019

The main ice edge in the Bering Sea extends from near Quinhagak to 59.5N 164.1W to 61.8N 166.3W to 63.7N 164.5W to 64.3N 167.3W to 62.7N 169.7W to 63.5N 174.5W and continues west into Russian waters. The ice edge is mainly open water.

FORECAST FOR THE BERING SEA (Days 1 through 5)...Generally easterly winds will give way to northerly winds on Friday, continuing through Monday. The ice edge is expected to drift to the southwest 30 to 50 nm through Monday.



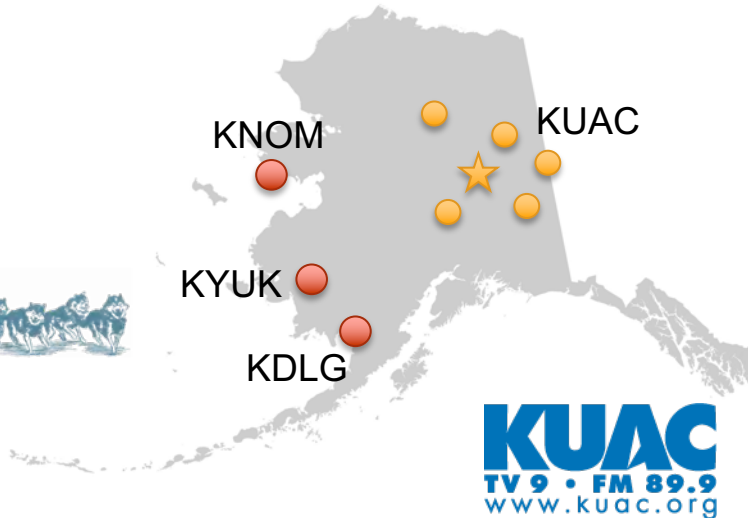
# “Your Listening to the ACCAP Radio Network”



**knom**  
RADIO MISSION



Climate Highlight



**KUAC**  
TV 9 • FM 89.9  
[www.kuac.org](http://www.kuac.org)

## Beyond The Weather

### 06-07-19 Beyond The Weather

By DAN BROSS • JUN 7, 2019



KUAC's Dan Bross talks to Asaka Center for Climate Assessment and Policy climate specialist Rick Thoman about the short lived thunderstorm season, and a notable exception.



Listen  
2:01

RIK THOMAS | ALASKA CENTER FOR CLIMATE ASSESSMENT  
AND POLICY



# Newspapers in and for rural Alaska

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## Spring temps smash records

MON 7:11 10/26 AM | Shady Grove Oliver

print email

It was an exceptionally warm spring across most of Alaska, with the highest departures from normal temperatures last month happening in the Northwest Arctic.

The Kotzebue area saw temperatures as high as 11.4 degrees above normal in May, with similar conditions in nearby villages. Utqiagvik saw a 6.6-degree jump, while the Prudhoe Bay area experienced temperatures more than 8 degrees higher than normal.

"It's quite a spring and certainly you (in Kotzebue) are in ground zero for the most remarkable of the warmth," said Rick Thoman, of the Alaska Center for Climate Assessment and Policy at the University of Alaska Fairbanks.

This spring broke temperature records across the state, with Utqiagvik experiencing its warmest spring of record.

"Farther east, where we have reasonable long-term data (like in the) Prudhoe Bay area, by far it was the warmest spring of record," Thoman said. "(It was) comparatively early snow out over most of the Slope. The tune is going to be the same as in Kotzebue. The timing, of course, is a little bit different on the Slope. But (it's) really quite a record event all across northern and western Alaska."



Photo by James Mason

**UNPRECEDENTED**— This photo taken on Monday, March 11, shows an unprecedented loss of ice at Nome.

## Western Alaska sea ice analysis

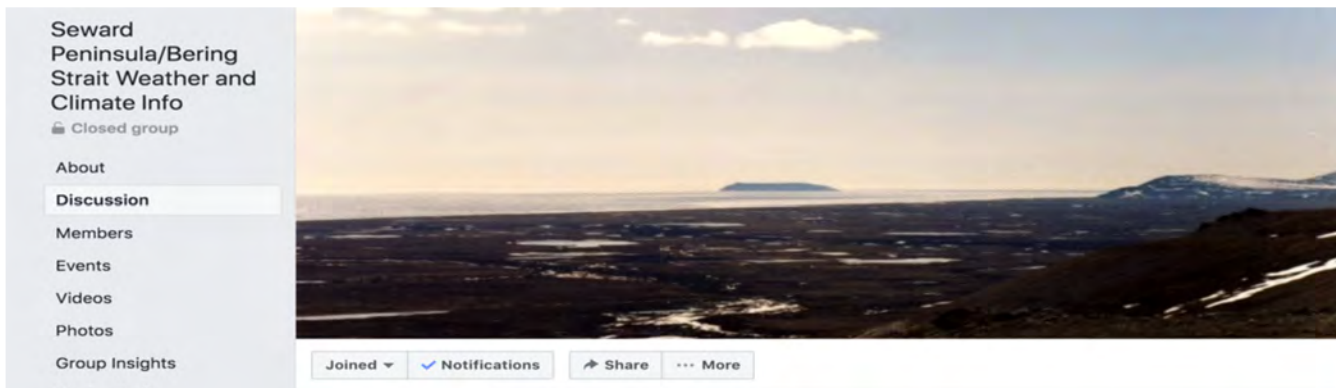
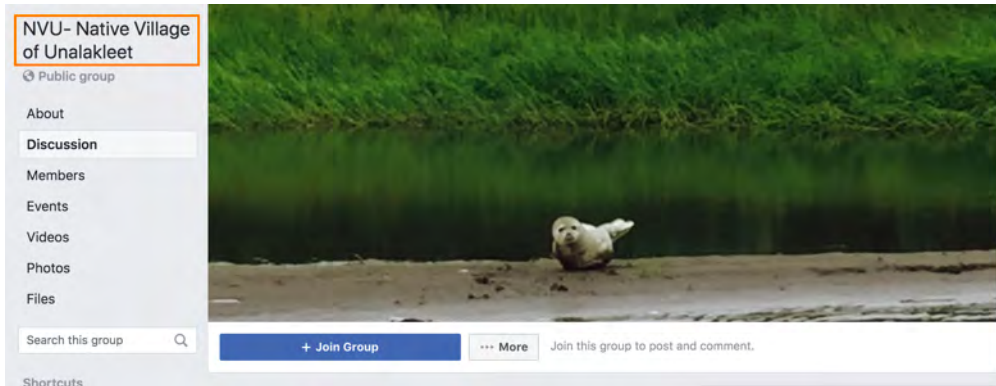
By Rick Thoman,  
Alaska Center for Climate Assessment  
and Policy at UAF

Changing winds have produced changes in sea ice in the region. Offshore winds reduced the ice that had piled up on the southern Seward Peninsula. There has been new ice growth in the Gulf of Anadyr over the past week, and ice has been moved south by the winds through the Bering Strait to the west half of St. Lawrence Island. A small amount of that ice has been pushed to the southwest of St. Lawrence Island. There remains some open water in Kotzebue Sound but broken ice has moved back to the northern Seward Peninsula coast. Except for small amounts of near shore ice, the Bering Sea from St. Matthew Island southward and Bristol Bay are sea ice

free. Overall the total ice extent in the Bering for the week ending March 10 was only 22 percent of normal, and much of that ice was in Russian waters. A couple of different weather systems will move through the region this week, resulting in changeable wind directions and temperatures. The overall impact will be to allow for somewhat more ice in the Bering Strait and St. Lawrence Island areas but with little overall change in Norton Sound and between the mainland and St. Lawrence Island. Near shore ice may remain or reform near the coast from Kuskokwim Bay to the Yukon Delta but there is no chance for significant ice growth in the open Bering Sea much south of St. Lawrence Island as sea surface temperatures are in the mid-30s°F as far as Nunivak Island.



# Facebook: Very Widely Used as Communications Tool

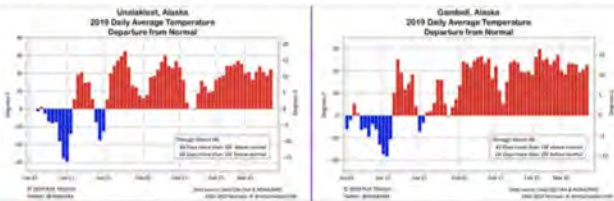




# Admin for Experimental Regional FB Group

**Rick Thoman**  
Admin · March 9 at 12:26 PM

My UAF colleague Brian Brettschneider has taken recently released, high-resolution statewide monthly climate normals and developed software to extract the values and calculate daily averages for individual points. This a big deal for western Alaska because it means that we can now get a much better handle on how temperatures are varying relative to normal for specific places that we're getting temperature observations from (that is mostly from the FAA Airport weather stations). Here are daily departures for Unalakleet and Gambell for this year through March 8th.



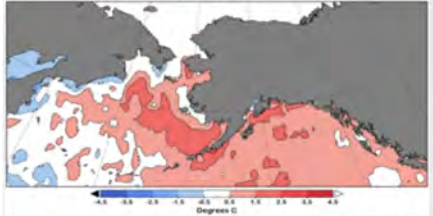
Gay Sheffield, Dave Snider and 4 others · 6 Comments · Seen by 54

Like · Comment

**Rick Thoman**  
Admin · April 4 at 5:12 PM

It's no big surprise that the Bering Sea surface water temperatures are warmer than normal, but it's also nearly the entire Gulf of Alaska and northeast Pacific too. It's really only Atka southwestward that ocean temperatures are close to normal. What will this mean for the whole Bering Sea ecosystem: fish, birds, marine mammals? We'll find out.

Sea Surface Temperature Departures from Normal  
March 17-April 03, 2019



0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0  
Degrees C

Brian Brettschneider and 3 others · 3 Comments · Seen by 44

Like · Comment


**Toby Anungazuk Jr** Thank you for posting this, now a question - at what water temperature does it trigger the first Phytoplankton Bloom in the Bering Sea that this stuff usually shows up?  
Like · Reply · 1d

**Rick Thoman** Good question. Maybe Gay or others here know this.  
Like · Reply · 1d

**Gay Sheffield** Hi Toby Anungazuk Jr - my understanding is it is a combination of factors (sunlight, warmth, and nutrients) that trigger certain algae to grow out of control (or "bloom"). Not as easy to say as one exact temperature. Makes it very difficult to exactly predict. Since we are on track for warmer water, summertime daylight, and our waters are nutrient rich...it is a real concern.  
Like · Reply · 1d



# Contribute to Community Focused FB Groups

 **Sea Ice for Walrus Outlook**  
April 1 at 8:53 PM · 🌐

Nice satellite image and SIWO shout-out from Rick Thoman (@AlaskaWx) on Twitter:

Increasing areas open water in the southern Chukchi Sea Sunday afternoon on Suomi NPP image from @uafgina. Remanent ice in Norton Sound & Bering Strait to St. Lawrence Is. Follow "Sea Ice for Walrus" on FB for latest from Bering Strait communities. #seaice #akwx @ArcticResearch

**March 31, 2019  
150pm AKDT  
Suomi NPP**

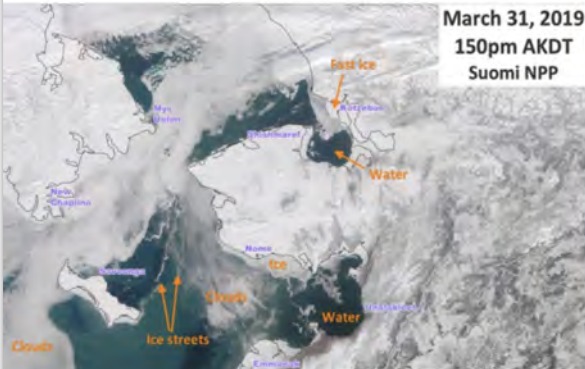


Image courtesy UAF/GINA  
Graphic and annotations by Rick Thoman, @AlaskaWx

 **Alaska Arctic Observatory and Knowledge Hub** ...  
Published by Rick Thoman [?] · 18 hrs · 🌐

Almost completely clear skies across northwest Alaska Wednesday afternoon, providing a great view from 400 miles up from the MODIS satellite. Lots of detail in the ice and, in the southern Chukchi Sea and Kotzebue Sound, open water.



**April 03, 2019  
245pm AKDT**

Image courtesy UAF/GINA  
Graphic and annotation by Rick Thoman, UAF/ACCAP



# Bering Strait

## Winter 2019 sea ice conditions



**Who we are**  
This summer we'll be brought to you by the International Arctic Research Center, Alaska Center for Climate Assessment and Policy, and Alaska Sea Grant.

IARC is a major Arctic research facility at the University of Alaska Fairbanks. One of our goals is to help Alaskans understand options for and adapt to climate change research in the Arctic.

**Questions or comments?**  
Please contact:  
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Climate Specialist  
rthomson@iarc.uaf.edu  
907-475-1686  
iarc.uaf.edu

### Open water in the Bering Sea ... again

Autumn 2018 started with very warm ocean temperatures in the southern Chukchi and Bering Seas. Again, this resulted in the very late formation of sea ice.

Sea ice coverage in the Bering sea during November was the least extensive on record in the satellite era since 1978. Freeze up of the Chukchi Sea was about two weeks later than the long term average date. However, a storm track during December and early January that favored storm movement along the Aleutians and into the Gulf of Alaska produced frequent north winds and occasionally cold temperatures in the Bering and Chukchi seas. This combination allowed for the rapid southerly expansion of sea ice from the Bering Strait region and optimism among coastal communities for record-normal spring sea ice conditions.

The amount of sea ice in the Bering Sea decreased in February by over 50%—an area larger than the state of Montana—an unprecedented loss of ice for this month.



Photo: Zoltan Kovacs on the Bering Sea ice near Umanuk on March 11, 2019. Image courtesy of Zoltan Kovacs and Jettie Jorgensen on the background on the sea ice in Umanuk area (front of the ship) (March 11, 2019).

### Severe storms batter sea ice

The weather pattern changed dramatically in late January 2019. For the next five weeks, 15 distinct storm systems culled across the central and western Bering Sea from the southwest to the northeast. This "parade of storms" brought seemingly non-stop south to southeast winds that decimated existing sea ice with large swells, above-freezing temperatures, and/or by pushing the ice northward. Impacts of this phreic of attacks on the sea ice have been apparent in the Bering Sea, Bering Strait, and southern Chukchi Sea. The amount of sea ice in the Bering Sea decreased in February by over 50%—an area larger than the state of Montana—an unprecedented loss of ice area for this month. February 2019 had been sea ice volume in the Bering Sea of just 42% of the 1978-2016 average, by far the lowest of record. The February 2019 extent was 14% of average, and through mid-month, the March extent was lower than even 2018.

International

## Dramatic declines in sea ice



Open water off Umanuk, Alaska March 1, 2019 (U.S. Coast Guard Auxiliary Sea Grant)

**Sea ice concentration**  
The Advanced Very High Resolution Radiometer 2 (AVHRR) aboard the NOAA-20 satellite is an instrument for measuring small increases in emission from Earth's surface and atmosphere. Here, it's used to determine sea ice concentration.



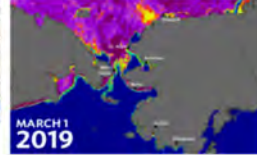
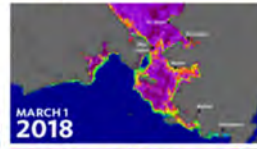
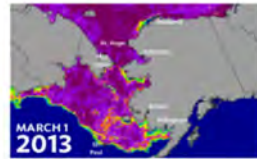
Sea ice data courtesy University of Bremen, courtesy of Rita Thomson, ACCAP@UAF.edu

### People must quickly alter food-gathering strategies to provide for the nutritional, cultural, and economic needs of their families.

The lack of sea ice in 2017-18—and now 2019—has had large repercussions on the northern Bering Sea marine ecosystem. With so little ice left in the Bering Sea in March 2019, this summer will feature considerably warmer than-normal ocean temperatures in the Bering and southern Chukchi seas. Environmental issues likely to result from a second year of open water conditions include large shifts to the entire northern Bering Sea ecosystem, and may include landings, fishes, and marine mammals. We don't fully understand the impacts of this winter's low sea ice and warmer ocean temperatures on marine mammal behavior. Coastal communities with active marine subsistence activities will be the first to see these impacts.



Photo: Zoltan Kovacs on the Bering Sea ice near Umanuk, Alaska March 11, 2019. Image courtesy of Zoltan Kovacs and Jettie Jorgensen on the background on the sea ice in Umanuk area (front of the ship) (March 11, 2019).



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# Supporting organization working in rural Alaska with appropriate & relevant climate information



ALASKA NATIVE  
TRIBAL HEALTH  
CONSORTIUM



Arctic OneHealth



# Building Relationships, One Briefing at a Time

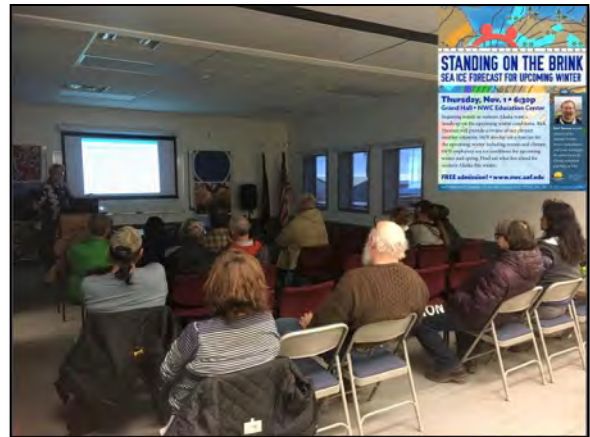
## Winter Sea Ice Outlook Briefing



Little Diomed Tribal Office



Gay Sheffield (Sea Grant Alaska)  
Rick Thoman in Nome



UAF NW Campus in Nome  
Strait Science 2018



Thanks Masi'

Gunalchéesh

Quyanaq Tsín'ęę

#### Resources

- ACCAP: <https://accap.uaf.edu/>
- IARC: <https://uaf-iarc.org/>
- Twitter: @AlaskaWx
- FaceBook
- Sea Ice for Walrus
- Alaska Arctic Observatory and Knowledge Hub

