

# COMMUNITY-BASED OBSERVATIONS OF FALL FREEZE-UP AND ICE INTERACTING WITH THE COASTLINE

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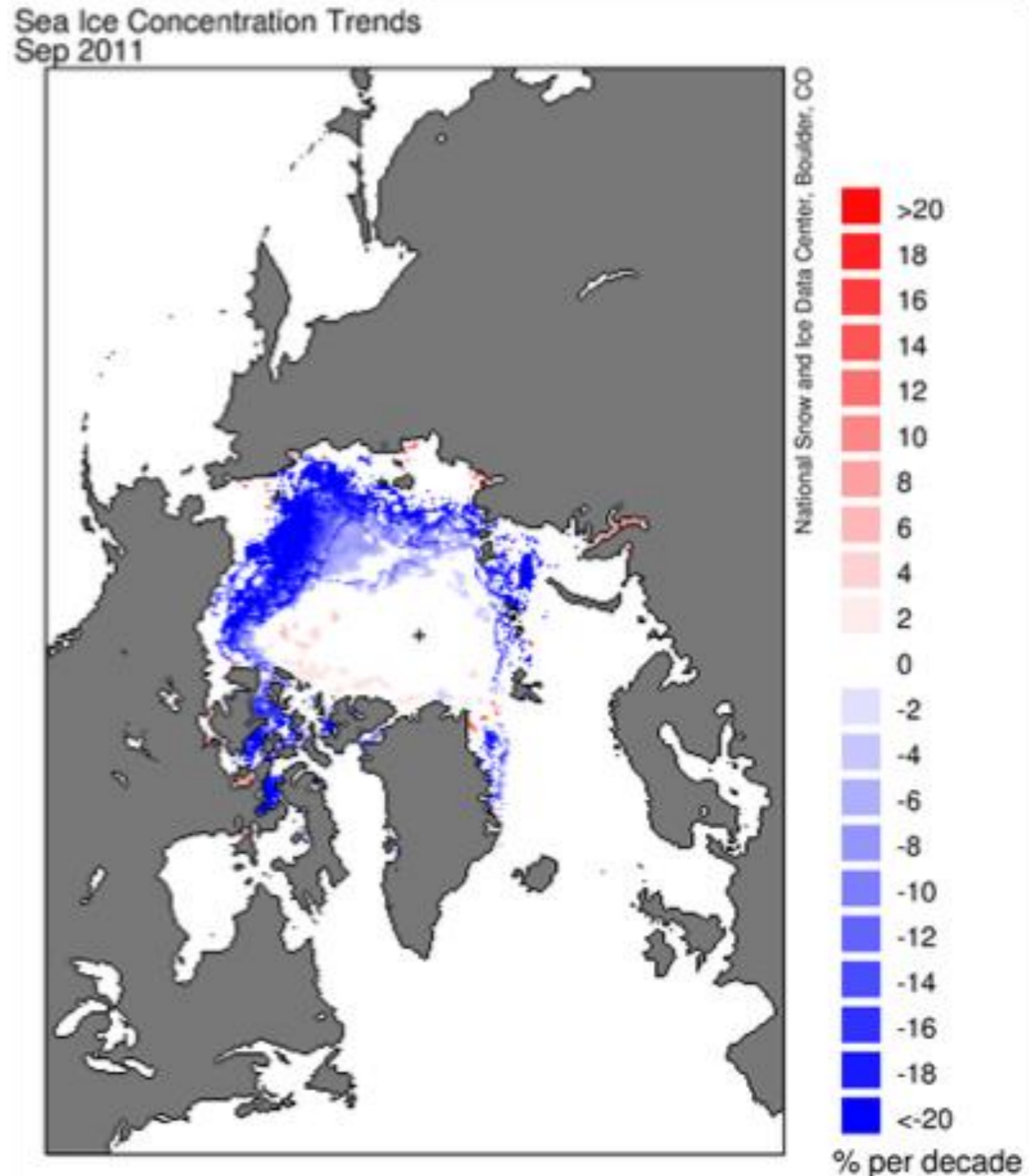
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# Alaska: Large reduction in summer sea ice extent

- Less extensive summer sea ice north of Alaska
- Coasts are more vulnerable to storms and ice interaction in the fall



# Observations of fall freeze-up and impact of storms on the coast fall 2013

## Why?

Improve forecasts of storm impacts and assess vulnerability of the coast

## How often?

Regular observations of progress of freeze-up (first ice, stable ice etc.)

Brief observations and photos also of great value

## What to observe?

First appearance of different ice types

Ice impacting travel conditions on the ice (rough ice, thin ice)

Ice protecting the coast (ice berms, bottomfast ice etc.)

Ice interacting with shoreline (ice push, mud and sand frozen into ice)



## Fall Freeze Up Log Sheet

Western Alaska LCC



It is important to understand the details of how sea ice is changing along Alaska's shorelines, and how this change affects the coastline and coastal communities. In a small pilot project, we want to learn more about how ice, waves and wind interact with the coast during freeze-up. In particular, we are interested in observations in your community of how nearshore ice protects or damages the coast and impacts other activities in your area. The time period we are interested in is from the very first appearance of ice nearshore until the ice is stable and thick enough to travel on. This log sheet may be helpful in recording such observations. Also, we are interested in photos of some of the ice features or the potential impacts of storms, waves and ice on the coast.

**Your name:**

**Where was observation made (village and specific location):**

Observation	Date	Description (and guidance on additional helpful information)	
First signs of ice on the ocean			Is slush or grease ice visible in the ocean?
First signs of other types of ice			What type of ice (floe ice, old ice)? Where did it come from?
First appearance of ice attached to the shore			How far out does the shorefast ice extend?
Ice berm formed (ice wall protecting shore along beach)			How did the berm form and how long did it stay in place?
Sea ice with mud or sand (dirty ice)			Where is the mud in the ice (top, bottom, middle)? Did it form along shore or come from someplace else?
Ice push event (ice driven onto the shore)			
Ice pressure ridges forming (floating or grounded)			
Ice forming is rough/smooth, making over-ice travel difficult/easy			Is the ice rougher or smoother than usual? What caused this?
Strong ice movement and fracturing			
Unusually large waves, currents or coastal flooding			
Ice is stable enough to walk on for first time			
Additional observations – please record on back of this sheet			

Please include the Native name in Yupik or Inupiaq if that adds to the description.

We want to learn what is important to people in your community about the ice and ocean. Please include anything else you observed about coastal ice that is interesting or important to you. You can use the reverse side of this page or additional pages.

Once freeze-up is over, please mail this page to Ms. Mette Kaufman who is part of our project at the University of Alaska Fairbanks (contact information below, you can also call by phone).  
Quyana, Quyanaqpak and Quyanaqhalek! Thank you for your help.

Contact: Mette Kaufman, Geophysical Institute, University of Alaska Fairbanks  
PO Box 757320, 903 Koyukuk Drive, Fairbanks, AK 99775-7320.  
mrkaufman@alaska.edu (907) 474-5431

# Observation log sheet

- First signs of ice on the ocean - When and what type of ice?
- First shorefast ice - When? Stable?
- Ice berm formation
- Unusual smooth or rough ice
- Other noteworthy events or conditions

# Freeze-up observations fall 2012



## Kwigillingok

Last Updated by [mbrubaker](#) on Jan 3

This table documents sea ice evolution in Kwigillingok for fall freeze up 2012.

Name of observer: Noah Andrews

### First signs of different ice types on the ocean:

10/08/12 - Lakes start to freeze

10/12/12 - Ice started to flow from up river, where it freeze first

### First signs of ice

#### attached to the shore:

10/17/12 - Thin ice started to form on the mud flats

### Ice berm formed (ice wall

#### protecting shore along beach:

10/23/12 - Ice that was pushed by the tide started to form on shore

### Sea ice with mud or sand (dirty ice):

The ice w/mud and sand only forms when the ice got thin

### Ice push event (ice driven onto shore):

11/02/12 - Tide started to push ice along the shore and form small bergs

### Ice pressure ridges forming (floating or grounded):

11/02/12 - On the mud flats ridges are now visible

### Strong Ice movement and fracturing

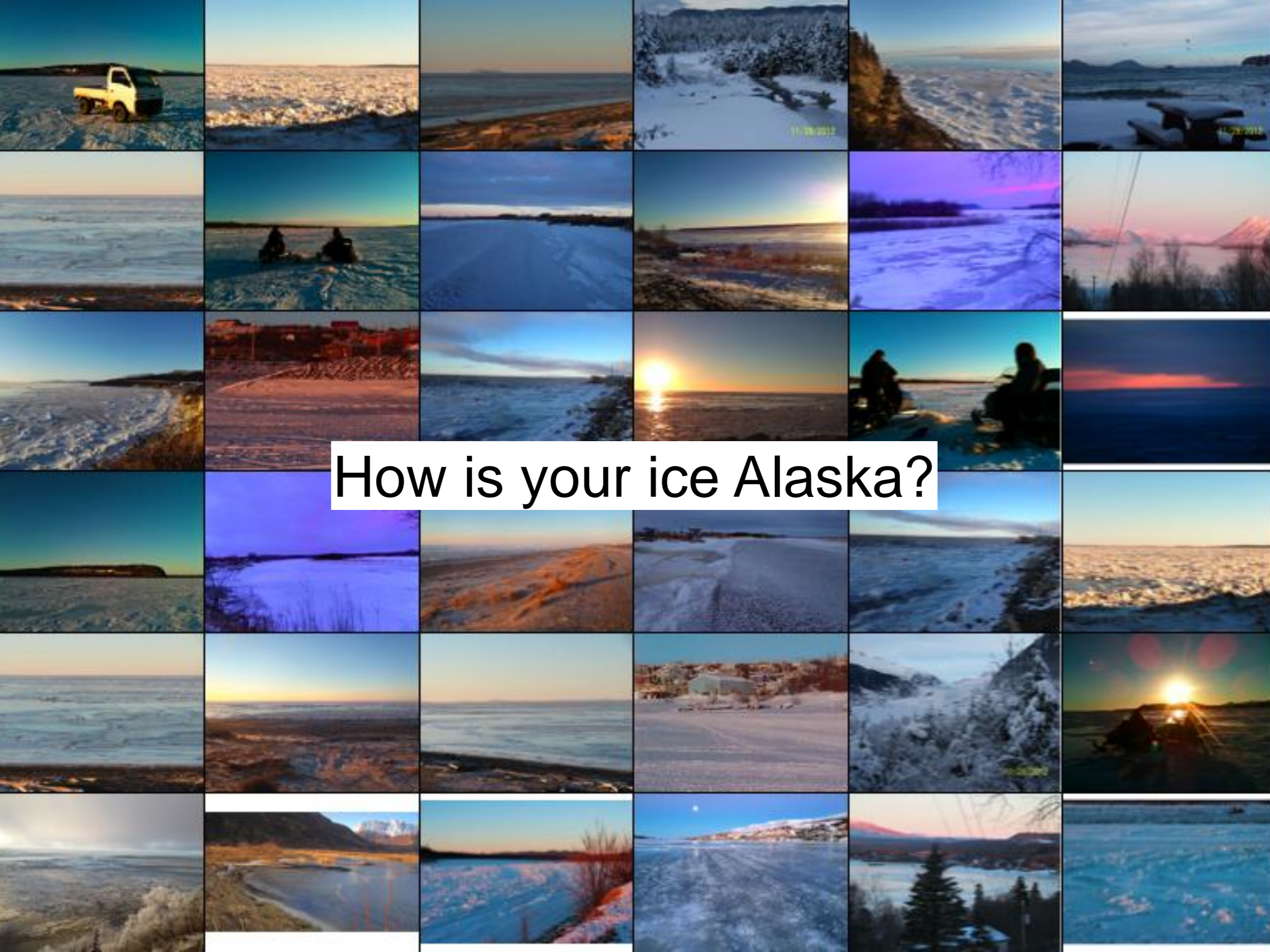
The ice along the shore on ocean is not thin enough to start this

[Directions](#) [Search nearby](#) [Save to map](#) [more](#) ▾

# What to do with observations

- For regular LEO observers: Please submit through LEO network
- Please record observations (log sheet, computer, text message)
- E-mail observations to Ms. Mette Kaufman:  
mrkaufman@alaska.edu
- Phone: (907)474-5431, Text: (907)347-5350, Fax: (907)474-7290
- You can also collect observations and send in at end of freeze-up (when shorefast ice is stable enough to walk on) to Ms. M. Kaufman  
Geophysical Institute,  
UAF, PO Box 757320  
Fairbanks, AK 99775

**If possible please include  
photos (email or text message)**



How is your ice Alaska?

# Kwigillingok

Observer: Noah Andrew

Dillingham

Photo by: Jennifer L. Skarada

10/17 - Thin ice forming on mud flats

10/23 - Ice that was pushed by the tide started to form on shore

11/02 - Tide started to push ice along shore and form small bergs

Ice with mud and sand only form when ice got thin





# Ice trafficability

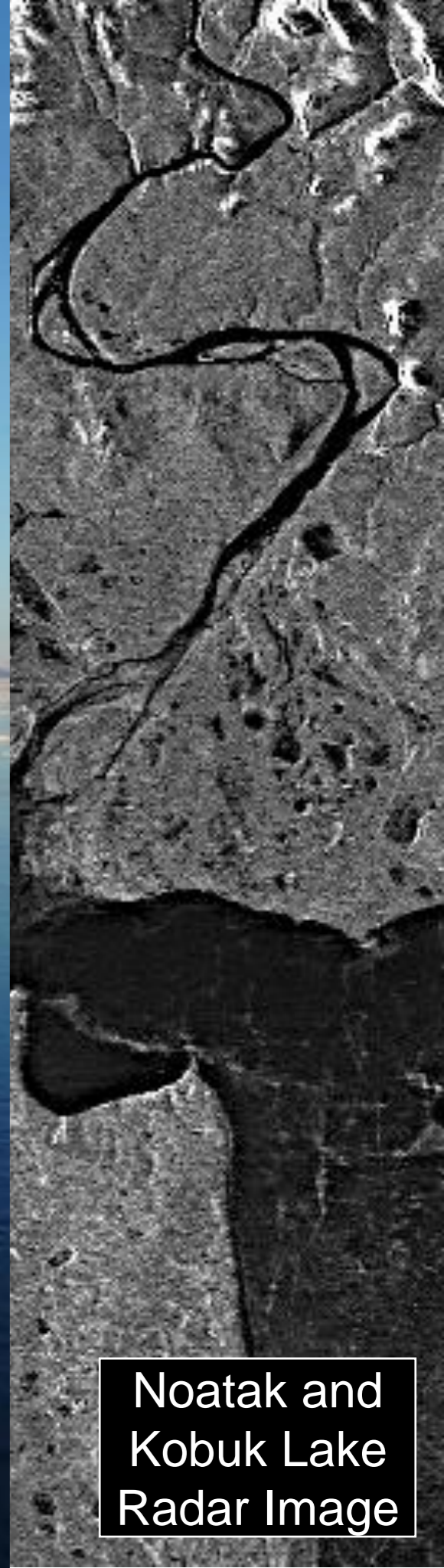
- Seasons ice trafficability may in part be determined during freeze up
- Goal to assess travel conditions from high resolution remote sensing



- Local observations may serve as ground data to develop techniques to evaluate trafficability and safety

Kotzebue

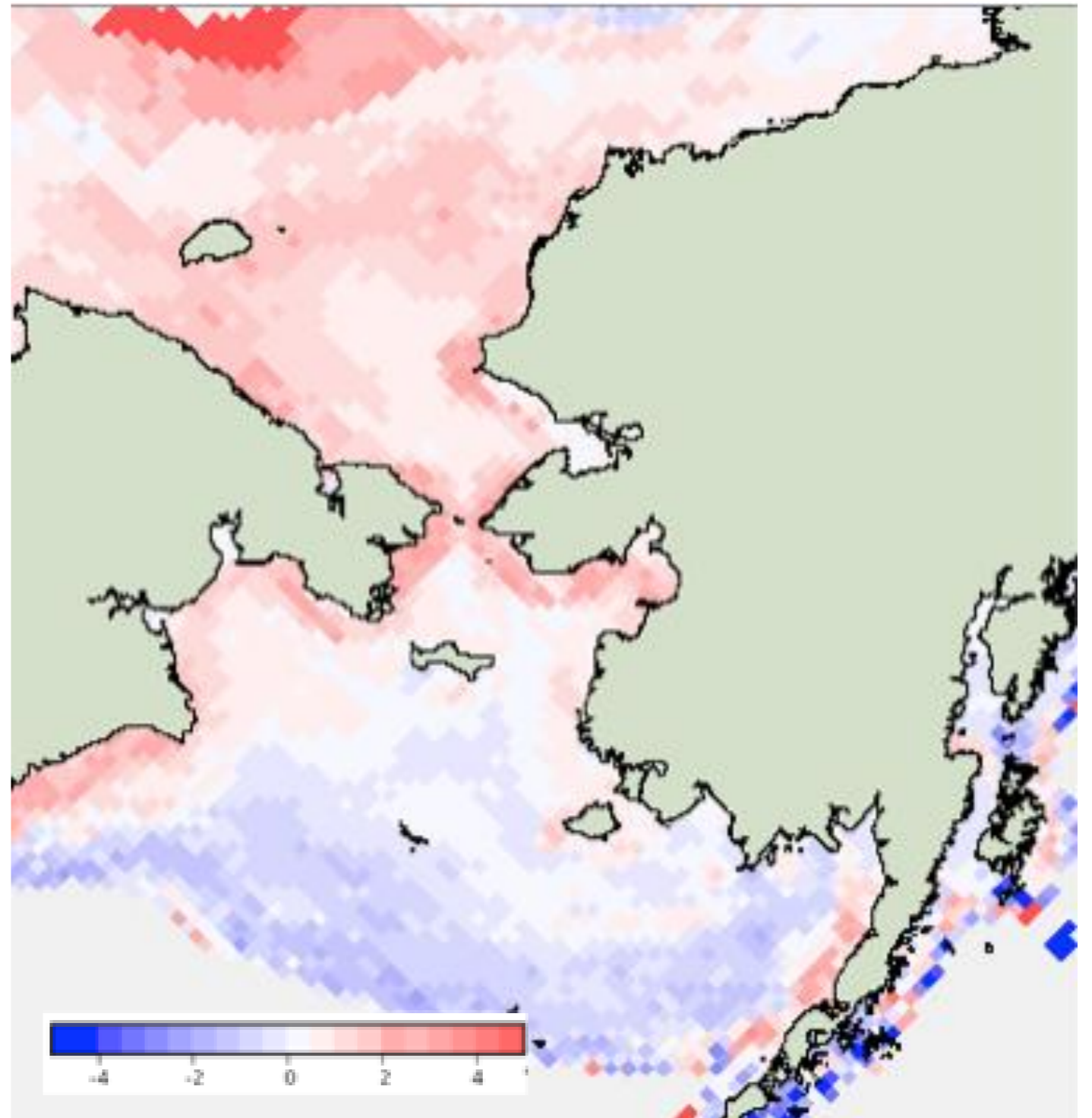
Photo by: Seth Kantner



Noatak and  
Kobuk Lake  
Radar Image

# Combining local observations with satellite data

- Building on local observations we can create maps of changes in freeze-up between 1979 and today
- Freeze-up delayed by up to 2-3 days per decade
- Norton Sound, Bering Straits region, southern Chukchi Sea coasts



A serene sunset scene over a vast, calm ocean. The sun is a bright, glowing orb positioned slightly left of the center, partially obscured by soft, wispy clouds. The sky transitions from a pale yellow near the horizon to a deeper orange and then to a clear, light blue at the top. The ocean's surface is textured with gentle ripples and small waves, reflecting the warm light of the setting sun. The overall mood is peaceful and contemplative.

Thank you!