

# SIZONet / Eloka community-based sea ice observations:

Education, outreach & update on sea ice  
conditions

Hajo Eicken  
Mette Kaufman  
Irene Holak

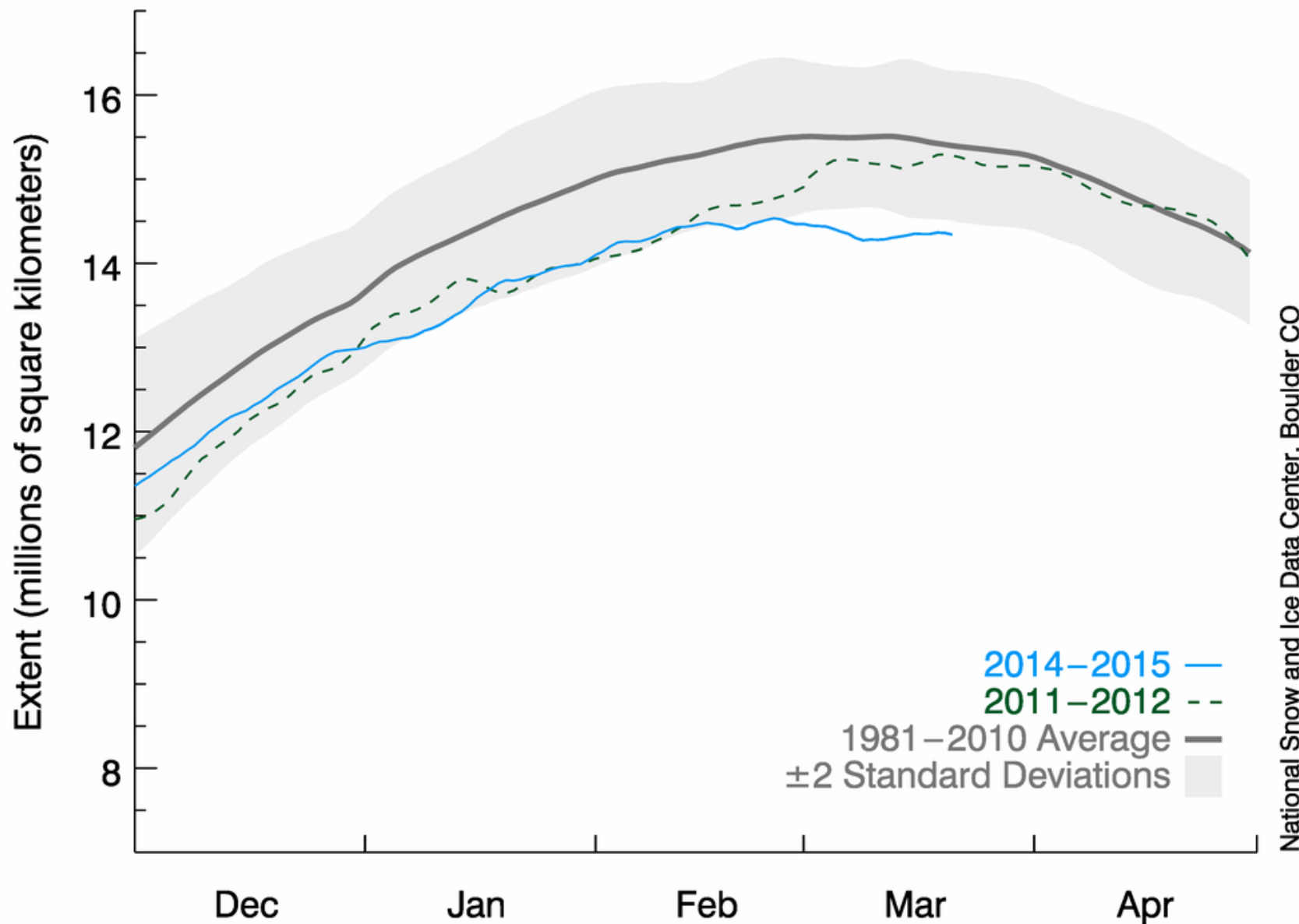
# Update on sea ice conditions

Hajo Eicken

University of Alaska Fairbanks

# Arctic Sea Ice Extent

(Area of ocean with at least 15% sea ice)



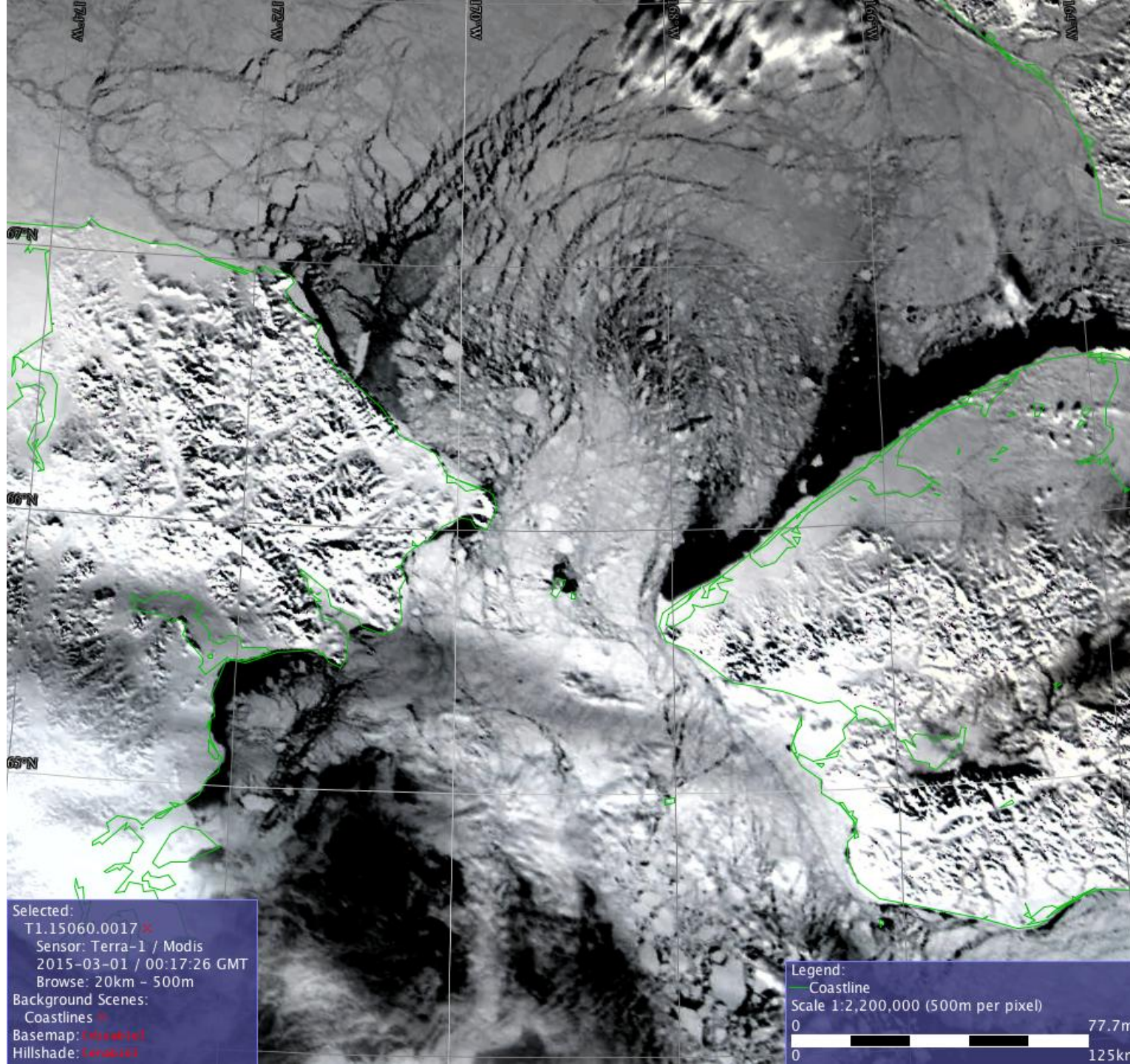
National Snow and Ice Data Center, Boulder CO

Sea Ice Extent  
02/25/2015



National Snow and Ice Data Center, Boulder, CO

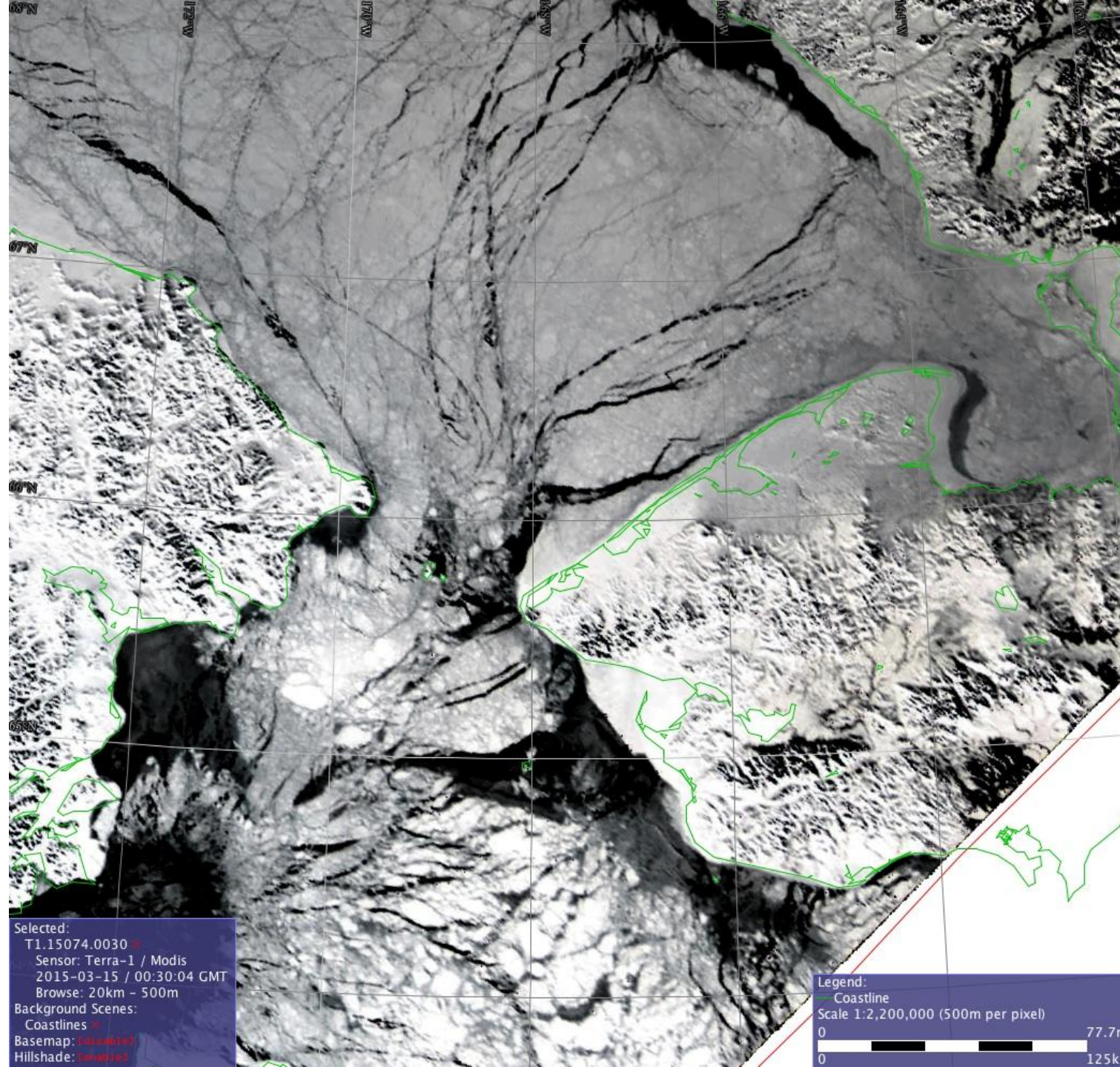
median  
1981–2010



Selected:  
T1.15060.0017  
Sensor: Terra-1 / Modis  
2015-03-01 / 00:17:26 GMT  
Browse: 20km - 500m  
Background Scenes:  
Coastlines  
Basemap: [T1.15060.0017](#)  
Hillshade: [T1.15060.0017](#)

Legend:  
Coastline  
Scale 1:2,200,000 (500m per pixel)  
0 77.7mi  
0 125km





Selected:  
T1.15074.0030  
Sensor: Terra-1 / Modis  
2015-03-15 / 00:30:04 GMT  
Browse: 20km - 500m  
Background Scenes:  
Coastlines  
Basemap: [GlobalMap](#)  
Hillshade: [Hillshade](#)

Legend:  
Coastline  
Scale 1:2,200,000 (500m per pixel)  
0 77.7mi  
0 125km

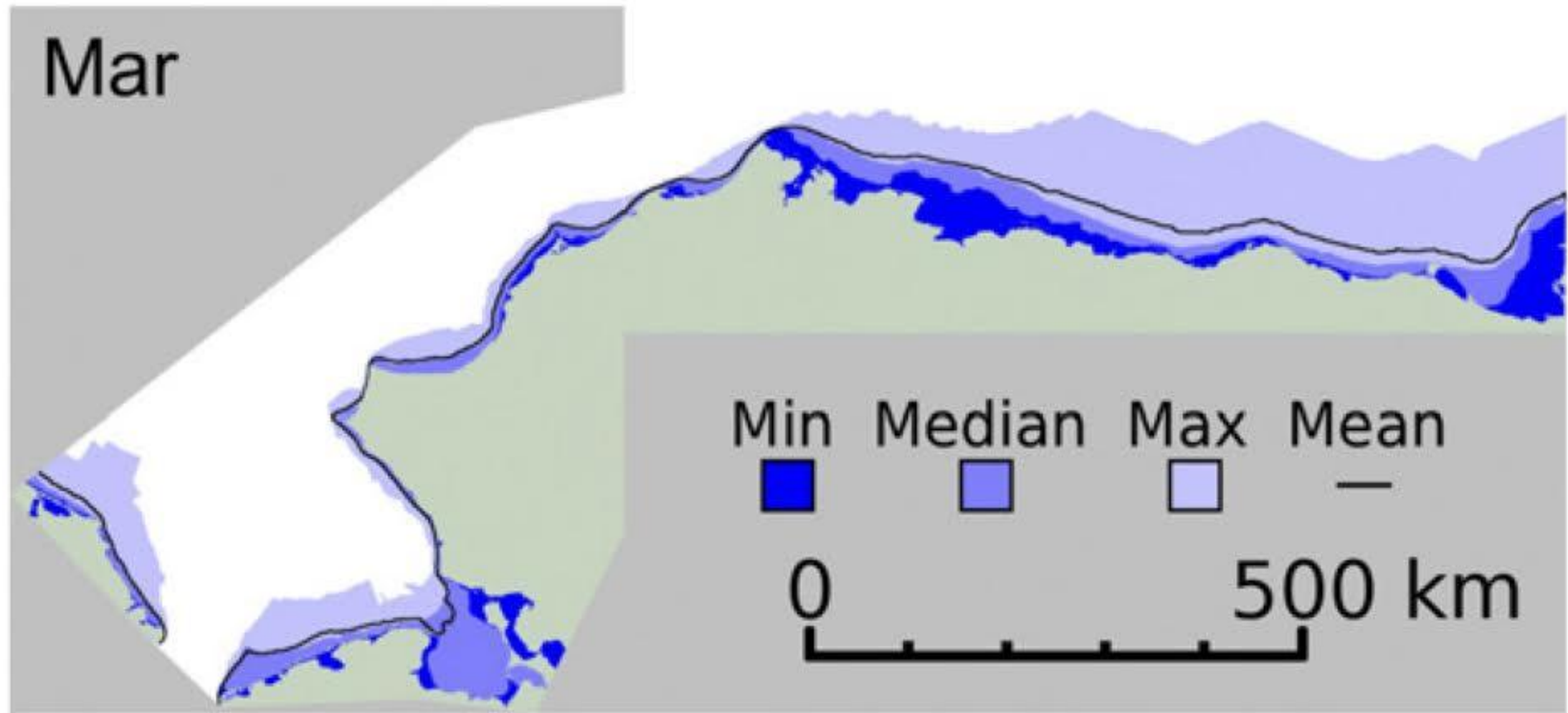


Figure 1: Normal shorefast ice extent for the month of March. Note that a typical (“mean”) ice extent is much further from shore, grounded on a shoal between Wales and Shishmaref. However, extreme minimum extent with very little or no shorefast ice has occurred in the past 20 years or so.



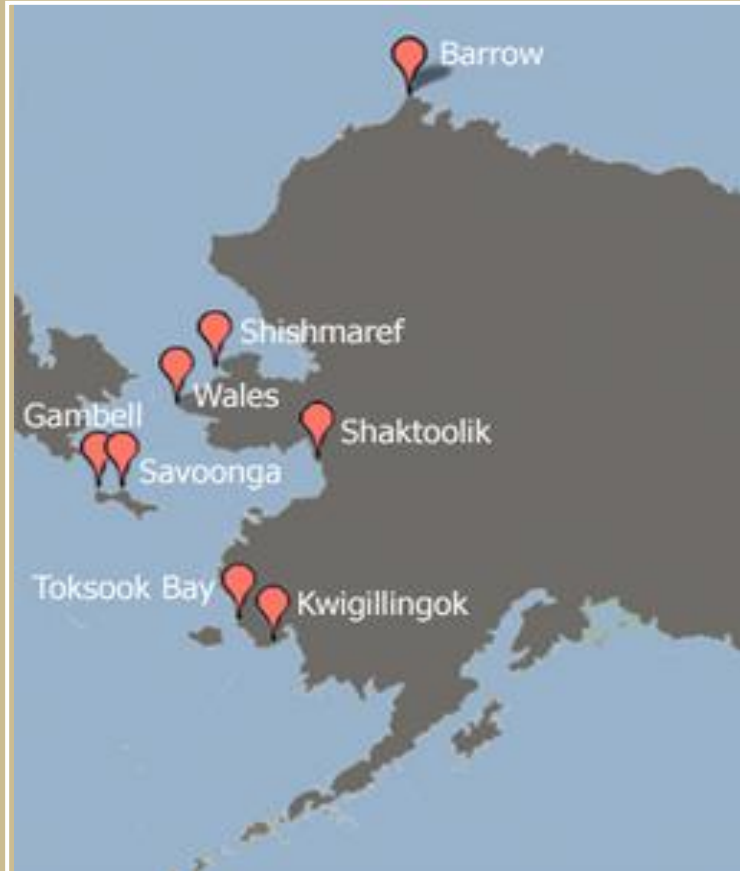
# SIZONet community-based observations program & database

Mette Kaufman  
University of Alaska Fairbanks



- Partnering with local sea ice experts and hunters
- Main focus is sea ice
- Nearly 5000 observations since 2006
- Observations available through online database
- Partnership with ELOKA





<https://eloka-arctic.org/sizonet/>

## Levels of access:

Guest (Public) – limited access & must adhere to a user agreement

Communities & registered users – full access, secure & password protected



The Local Observations database was developed to record, archive, and share indigenous sea ice knowledge and expertise. This information is generously shared with the public by the observers and the communities within which the observers reside. We ask that anyone interested in browsing or using the information review and agree to adhere to the ethical and appropriate use guidelines.

Visit the Contacts link if you have questions or would like to contribute observations.

## Access to the Observations Catalog

### Use Agreement

I understand that the observations compiled in this product were made by recognized local sea ice experts and are shared generously by the observers and their communities to help further education, scientific research, and communication between holders of local and indigenous knowledge and research scientists. I also understand that the observations were made in the context of sea ice knowledge and use specific to the different communities that are part of this project; any interpretation of the data should respect this context.

When using or referencing data from this product for research or reporting purposes, I:

1. Must acknowledge and cite by name the person(s) whose observations are being discussed or analyzed, unless the name of the observer(s) is not identified in the observation record.
2. Must use the following citation to reference the data set: Apangalook, L., P. Apangalook, S. John, J. Leavitt, W. Weyapuk, Jr., and other observers. 2013. *Local Observations from the Seasonal Ice Zone Observing Network (SIZONet)*. [indicate subset used]. Edited by H. Eicken and M. Kaufman. Boulder, Colorado USA: National Snow and Ice Data Center. <http://dx.doi.org/10.7265/N5TB14VT>.
3. Should refer to the specific context within which the observations were made and compiled, as outlined in the following paper that provides additional background information: Eicken et al. (2014, in press) A framework and database for community sea ice observations in a changing Arctic: An Alaskan prototype for multiple users. *Polar Geograph.*, in press.

By accessing the data, I agree to the above Use Agreement.

### Guest Access:

☐ I hereby agree to abide by the terms set forth in the Use Agreement.

[Continue](#)

### Registered Users:

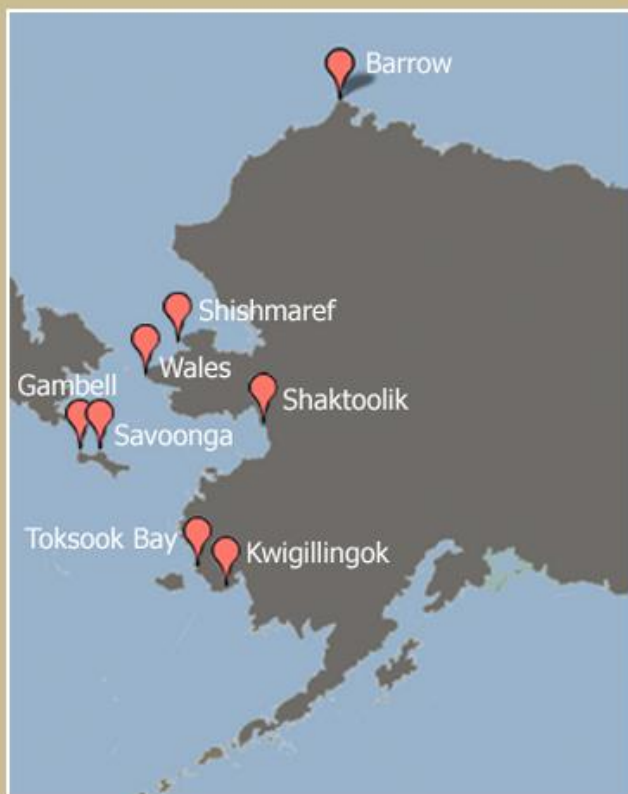
Email

Password

[Login](#)

[Home](#)[Search Observations](#)[About](#)[Research methods](#)[Contacts](#)[Add observation](#)[Logged in as Mette Kaufman](#)[Log out](#)

## Search the observations catalog:

[View All](#)Search for: AND: AND: Date range:  to





## CURRENT SEARCH

**Keyword(s):** walrus

**Date(s):** 2006-04-01 - 2014-12-31

**Village(s):** All

**Observer(s):** All

[Refine Search](#)

[New Search ►](#)

## Search Results


Showing observations 1 - 20 of 263

20 per page ▼

Go to Page:  [Go](#)

[First](#) [← Previous](#) [Page 1 of 14](#) [Next →](#) [Last](#)

Sort by: [Date \(Latest-Oldest\)](#) ▼

Date	Observer	Village	Additional elements noted ( <a href="#">legend</a> )		
2014-07-25	Joe Leavitt	Barrow	   	<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-05-31 09:25 AM	Winton Weyapuk Jr.	Wales	    	<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-05-25 08:30 AM	Winton Weyapuk Jr.	Wales	  	<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-05-23 07:45 AM	Winton Weyapuk Jr.	Wales	   	<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-05-18 07:30 AM	Winton Weyapuk Jr.	Wales	  	<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-05-17 07:10 AM	Winton Weyapuk Jr.	Wales	  	<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-05-08	Curtis Nayokpuk	Shishmaref		<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-05-08 01:15 PM	Winton Weyapuk Jr.	Wales	  	<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-04-30 08:20 AM	Winton Weyapuk Jr.	Wales	 	<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-04-25	Fred Tocktoo	Nome		<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-04-18	Simeon John	Toksook Bay, Nelson Island	     	<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	
2014-04-13	Simeon John	Toksook Bay, Nelson Island	   	<a href="#">Transcript</a>	<a href="#">Edit</a>
				<a href="#">All details</a>	



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2014-05-17 07:10 AM	Winton Weyapuk Jr.	Wales		<a href="#">Transcript</a>	<a href="#">Edit</a>
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2014-04-18	Simeon John	Toksook Bay, Nelson Island	    	<a href="#">Transcript</a>	<a href="#">Edit</a>
2014-04-13	Simeon John	Toksook Bay, Nelson Island	   	<a href="#">Transcript</a>	<a href="#">Edit</a>

31 May 2014 9:25 A.M. Skies are overcast, wind N at 10, temperature 34 F, visibility 1 mile with light fog and light rain. There are a few scattered floes moving north. A part of the shore fast ice broke off all the way to the beach along Cape Mountain. Two boats came home from hunting between 8 and 9 A.M. They got ringed, spotted and young bearded seals. 3:00 P.M. The shore fast ice broke off to the beach to below the school at the south end of the village. (include in May 31 observation) Via email on June 2: Our shore fast ice went out over the weekend and is continuing to break off towards the north. It was a poor hunting season here due to weather and sea ice conditions and also partly due to rough shorefast ice conditions. A few walrus, bearded seals and other seals were gotten though. Crews still hoping to head north to any remaining shorefast or pack ice to hunt though.

Close



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2014-04-13	Simeon John	Toksook Bay, Nelson Island	   	<a href="#">Transcript</a> <a href="#">All details</a>	<a href="#">Edit</a>



Observation ID: WALWE1405310925

Recorder: Mette Kaufman

Observer: Winton Weyapuk Jr. (Wales)

Date: 2014-05-31

Time: 09:25 AM

New Search ►

## Observation Details

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[Edit Observation](#)

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### Transcript

31 May 2014 9:25 A.M. Skies are overcast, wind N at 10, temperature 34 F, visibility 1 mile with light fog and light rain. There are a few scattered floes moving north. A part of the shore fast ice broke off all the way to the beach along Cape Mountain. Two boats came home from hunting between 8 and 9 A.M. They got ringed, spotted and young bearded seals. 3:00 P.M. The shore fast ice broke off to the beach to below the school at the south end of the village. (include in May 31 observation) Via email on June 2: Our shore fast ice went out over the weekend and is continuing to break off towards the north. It was a poor hunting season here due to weather and sea ice conditions and also partly due to rough shorefast ice conditions. A few walrus, bearded seals and other seals were gotten though. Crews still hoping to head north to any remaining shorefast or pack ice to hunt though.

*This record contains an unusual condition or situation.*

### Observation source(s):

- Local knowledge/comment

### Sea ice related activities

#### Hunting

Boat count: 2



7 June 2013, Shishmaref boat launch



(Figure 1) 9 June 2013, zoomed pic of Shishmaref boat launch

### Sea ice observations

#### Ice direction:

N

#### Shorefast ice condition:

Shorefast ice is deteriorating  
Pieces of shorefast ice breaking off

#### Pack ice condition:

Scattered floes

### Weather

#### Visibility:

Approximately 1.0 miles

#### Wind speed:

Approximately 10.0 mph

#### Air temperature:

Approximately 34.0 Fahrenheit

#### Condition:

Fog

#### Precipitation:

Rain

#### Sky:

Overcast

#### Wind direction:

N

### Game and Wildlife

#### Marine Mammals:

Bearded seal (Taken)

Ringed seal (Taken)

Seal (Taken)

Spotted seal (Taken)

Walrus (Taken)

Observation ID: WALWE1405310925

Recorder: Mette Kaufman

Observer: Winton Weyapuk Jr.  
(Wales)

Date: 2014-05-31

Time: 09:25 AM

New Search ►

## Observation Details

[Back to search results](#)

[Previous](#) [Next](#)

*This record contains an unusual condition or situation.*

### Observation source(s):

- Local knowledge/comment

### Sea ice related activities

#### Hunting

**Boat count:** 2



7 June 2013, Shishmaref boat launch



(Figure 1) 9 June 2013, zoomed pic of  
Shishmaref boat launch

### Sea ice observations

#### Ice direction:

N

#### Shorefast ice condition:

Shorefast ice is deteriorating

Pieces of shorefast ice breaking off

#### Pack ice condition:

Scattered floes

### Weather

#### Visibility:

Approximately 1.0 miles

#### Wind speed:

Approximately 10.0 mph

#### Air temperature:

Approximately 34.0 Fahrenheit

#### Condition:

 Fog

#### Precipitation:

 Rain

#### Sky:

 Overcast

#### Wind direction:

 N

### Game and Wildlife

#### Marine Mammals:

Bearded seal (Taken)

Ringed seal (Taken)

Seal (Taken)

Spotted seal (Taken)

Walrus (Taken)

General observation information

Weather detail

Ice detail

Wildlife

Activity detail

Photos/Video

View All Details ►

Observation ID: WALWE1206150920

Recorder: Diloolia Erickson

Observer: Winton Weyapuk Jr. (Wales)

Date: 2012-06-15

Time: 09:20 AM

Observation location: Diomedes

Observation text: 9:20 A.M. Skies are clear, wind NE at 15, temp 37 F, visibility unlimited. There is open water with no pack ice visible. Shore fast ice remains 7 to 8 miles north of Wales. There were two Wales crews hunting yesterday north of the village along the edge of the shore fast ice. Additional notes for SIWO contribution via email: We have seen very little pack ice on our side of the strait. The pack ice that has been moving north through here has been near the Diomedes Islands and the Chukotkan coast. Some walrus were finally harvested yesterday by a crew from Teller hunting from Wales 9 miles north of Little Diomedes Island. No Wales crews have harvested any walrus so far. Shore fast ice remains from 7 to 8 miles north of Wales and Wales crews have been hunting bearded seals and ringed seals from that area. Hunters have been climbing Cape Mountain to look for pack ice but very little has been seen in the past two weeks or so.

Ice feature:

Ice event:

Native sea ice term:   
(Mouse-over for description)  
Apugauti  
Aukaaniq  
Cikullaq

Add native sea ice term to valid list above:

Term:

Description:

Ice direction:

Ice concentration:

Ice type:

Shorefast ice condition:

Ice cycle:

Lead condition:

Pack ice condition:

River ice condition:

Open water condition:

Dark sky visible: ☐

Shorefast ice thickness:  is approximately  inches

Distance to the pack ice:  is approximately  miles

Distance to lead/open water:  is approximately  miles

Update observation

Details = search terms



# Ongoing database development (ELOKA):

- Improving search capabilities
- Indigenous languages
- Mapping functions
- Video upload

Thank you!

# **Exploration of Utility & Expansion of Indigenous Knowledge within SIZONet Local Observation Program Database: Pilot in Barrow, Alaska of the North Slope Borough**

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**Irene Holak**  
**Antioch University New England, New Hampshire, USA**



# Pilot Development

- Combining Three Interests:

1) **Geophysical Institute,**  
*University of Alaska Fairbanks,  
Alaska*

2) **North Slope Borough School  
District** - *Barrow's Eben Hopson  
Middle School & Barrow High  
School*

3) **Antioch University New  
England**



Source from C<sup>3</sup> Workplace



# Project Goals & Objectives:

- **Exploring SIZONet Local Observation database...**

- 1) **UTILITY**

*...How useful is the database as a resource to the community and within the NSBSD?*

- 2) **FOOD SECURITY TERMINOLOGY**

*...What Western food security (food availability, feasibility of accessing food, and utilization of food through) terms exist in the database? Where can it improve?*

- 3) **FRAMEWORK FOR A PILOT**

*...through a student-lead, place-based sea-ice observation mini-database (SIOD) with Barrow schools.*

# Community Connection:



Source from Irene Holak at the Blanket Toss, June 2014

- **Methods:**  
**Qualitative Semi-formal Interviews**  
(age = ~30+; n = 20+)
- **Suggestions & feedback on:**
  - a) Improvements to SIZONet Local Observation database
  - b) Insight on food utilization (e.g. food storage)
- **Greatest Improvement suggestions** (e.g. Greater North Slope representation)



# Pilot: School Use

- **Two Barrow School Science Classes** - 8th & 9th Grades - & a College
- Development of
  - a) Stronger sea ice units,
  - b) Local examples, and
  - c) Field observation skills & experience
  - d) Presentation opportunities



Source from Kevin Neyhard 8th Grade Science Class,  
Physical Science Section, 2014



**BARROW**  
HIGH SCHOOL

— Striving For Excellence —



**ILISAGVIK**  
COLLEGE



**EBEN HOPSON**  
MIDDLE SCHOOL

— Striving For Excellence —

Search Curriculum

Unit Planner

Actions

North Slope Borough School District

Grade 8

Science

Science 8 (Unit)

Week 1 - Week 5

Last Updated: Sunday, February 15, 2015

by CCAT \*\*Science

Sea Ice Structure \*D

Collaboration

Unit Review

Unit Description

Type Author Name:

Kevin Neyhard

with assistance from Irene Holak

This unit ties in molecular structures, thermal energy, and sea ice in order for students to gain a deep understanding of, and to be able to identify, the different types of sea ice. Students study the molecular structure of water. They then apply that knowledge to what happens to water molecules when you remove thermal energy and create ice. After they have a handle on the structure of fresh water ice, students apply that knowledge to how sea ice is formed at the molecular level under ideal conditions. Last, students then learn to identify the most common features and types of sea ice present around the coastal north slope areas.

Stage 1: Desired Results

ILF Overarching Understandings/Essential Questions

ILF Performance Expectations

ILF: Environmental Realm

K3-12

Environment

OU: In the Iñupiaq worldview, the spiritual dimension is an integral part of and not separate from all aspects of a person's awareness. [E.e.2]

EQ: What does the concept of "irrua" entail? [E.e.2.a]

OU: Each society has a distinct understanding about the nature of the cosmos. This understanding underlies conceptions of the role of humans and animals and the physical and spiritual relationships between humans and the rest of creation. [E.e.3]

EQ: How is the Iñupiaq worldview unique? [E.e.3.a]

ILF: Performance Expectations: Environmental Realm

Practitioner

Environment

Environment: Spirituality E.e.2

The student uses knowledge of traditional Iñupiaq culture to . . .

[P] E.e.2.4 Examine ways that traditional beliefs about the environment intersect and relate to scientific explanations.

Nature of the Cosmos E.e.3

The student seeks to understand the universe by . . .

[P] E.e.3.4 Observing, studying, and describing the world on microscopic, macroscopic, and astronomical scales.

Alaska State Standards

State Standards & GLs

NGSS: Science Performance Expectations(2013)

NGSS: MS Physical Science

MS.Structure and Properties of Matter

Performance Expectations

Show details

MS-PS1-1.Develop models to describe the atomic composition of simple molecules and extended structures. ~ Show details

MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy

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Access the interactive version of the NGSS here

2012 ELA and Math Standards

Content Area Understandings & Essential Questions

Source from Rubicon Atlas, Kevin Neyhard Sea Ice Unit, 2

# Pilot: Ongoing Efforts



Source from Lockhart Tactical



Source from <http://polarfield.wpengine.netdna-cdn.com/wp-content/uploads/2013/04/Image1.jpg>



# Acknowledgements

*Thank you to...*

- Geophysical Institute, University of Alaska Fairbanks: Dr. Hajo Eicken, Mette Kauffman, Joshua Jones, and the Sea Ice Group
- Antioch University New England: Dr. James Jordan
- North Slope Borough School District: Linda Frame, Caitlin Winebarger, Kevin Neyhard, Matthew Conforti, and other staff and teachers
- North Slope Borough & Mayor's Office
- Barrow Community: Assisted Living, Tuzzy Library, Andrew Skin, all interviewed members, Anne Jensen & Richard Glenn

Contact: Irene Holak

[iholak@antioch.edu](mailto:iholak@antioch.edu)

source of map from Iñupiaq Heritage Center, Barrow, Alaska, 2014