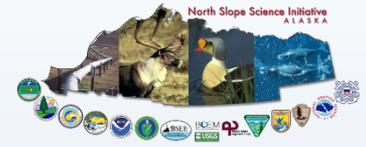


North Slope Science Initiative ALASKA



**ABOVE Workshop
January 19, 2016**

Jess Grunblatt



North Slope Science Initiative (NSSI)

- 1. Key information needs of organizations for management and/or environmental change monitoring.**
- 2. What activities are you carrying out focused on #1.**
- 3. Ongoing research and monitoring activities that are not Already part of existing ABoVE Projects.**

Transitioning Research to Applied
Data Development (regional North Slope)



NSSI Formation

NSSI formed as a “collective” in 2001, then created under Statute: Energy Policy Act of 2005

- *“...shall be to implement efforts to coordinate collection of scientific data that will provide a better understanding of the terrestrial, aquatic, and marine ecosystems of the North Slope of Alaska.”*

NSSI Personnel

Denny Lassuy: Acting Director

Dee Williams: Acting Deputy Director

John Payne: Senior Advisor (part-time)

Jason Taylor: Science Advisor

Maureen Clark: Communications Specialist Jess Grunblatt: Data Manager

NSSI Organization



Oversight Group
(senior executives)



**Senior Staff
Committee**
(scientists)

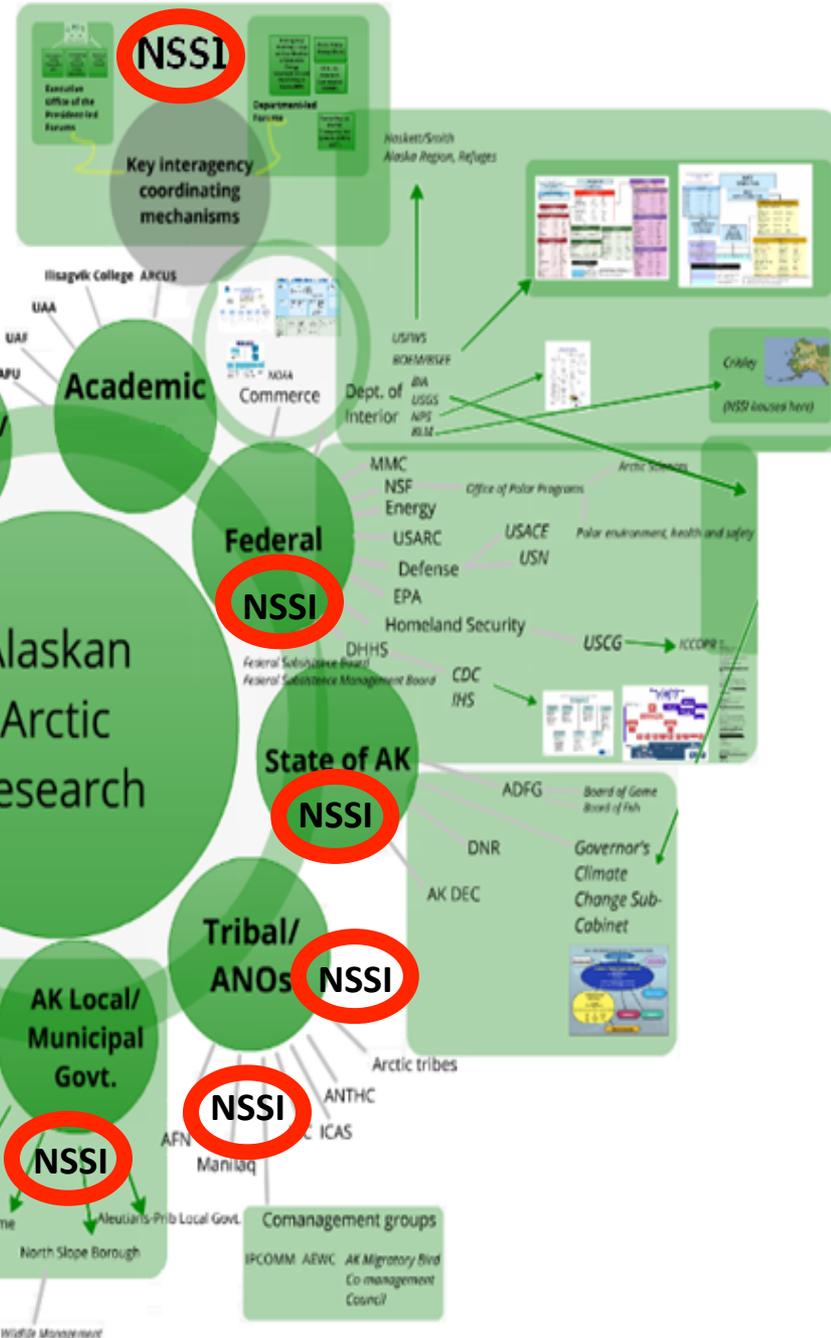
**Science Technical
Advisory Panel**
(agency mid-management)

federal	BLM	BOEM	BSEE	NPS	USFWS	NOAA
State/Local	ADNR	ADFG			NSB	ASRC
Advisory	USARC	USGS	USCG	NWS		

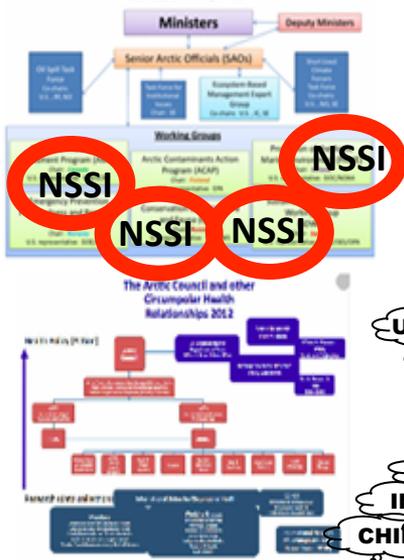
Broad Representation Within Arctic Management



National/Local

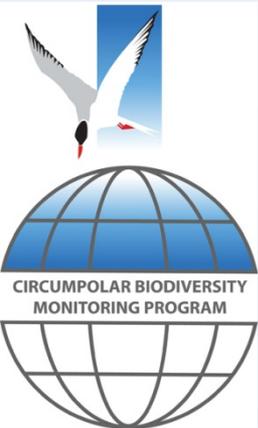


International





Circumpolar Biodiversity Monitoring Program



CBMP is an international network of scientists, governments, Indigenous organizations and conservation groups working to harmonize and integrate efforts to monitor the Arctic's living resources.

- June 2013 – United States (NSSI, in collaboration with BLM) assumes CBMP co-lead with Kingdom of Denmark

Terrestrial



Freshwater

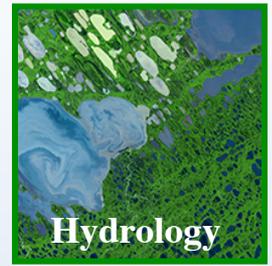
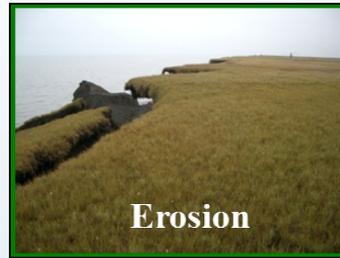


Coastal



Marine





Science Technical Advisory Panel (STAP)*

Landscape Ecology

Hydrology

Marine Mammals

Marine Biology

Permafrost

Terrestrial Ecology

Civil Engineering

Remote Sensing

Arctic Restoration

Traditional Knowledge

Oceanography

Geophysics

Marine Ecology

Biometrics

Avian Ecology



***Note: Participants selected for Expertise, but come from:
NGOs, Industry, Academia, Agencies, Communities**

NSSI WEBSITE

(northslope.org)

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NORTH SLOPE SCIENCE INITIATIVE ALASKA

ALASKA UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL WEATHER SERVICE BOEM Arctic Slope Regional Corp. USGS

Fostering Science Collaboration on Alaska's North Slope

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Emerging Issues

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Track projects and find scientific data collected to support decision-making on Alaska's North Slope.

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- Landcover Mapping
- Permafrost Mapping
- Winter Water Availability
- Imiq Hydroclimate Database

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- Arctic Daily Update: Friday, 1/15
- The Arctic This Week



Emerging Issues

[Click here](#) to download the entire document as a PDF



Weather and Climate



Increasing Marine Activity



Changing Sea Ice Conditions



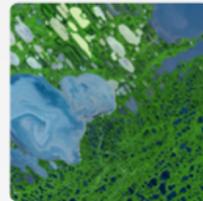
Contaminants



Permafrost



Coastal and Riverine Erosion



Hydrology and Lake Drying



Coastal Salinization



Fire Regime



Vegetation Change



Species of Interest:
Migratory Birds



Species of Interest:
Caribou



Species of Interest:
Marine Mammals and
Their Prey



Species of Interest:
Fisheries



Social and Economic
Dimensions of North
Slope Communities



Rehabilitation and
Restoration of
Disturbed Tundra

- Weather and Climate
- Increasing Marine Activity
- Changing Sea Ice Conditions
- Contaminants
- Permafrost
- Coastal and Riverine Erosion
- Hydrology and Lake Drying
- Coastal Salinization
- Fire Regime
- Vegetation Change
- Species of Interest
 - Migratory Birds
 - Caribou
 - Marine Mammals and Their Prey
 - Social and economic dimensions
 - Rehabilitation and Restorations

northslope.org

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Scenarios

NSSI WEBSITE

(<http://northslope.org>)



SCENARIOS FOR NORTH SLOPE DEVELOPMENT AND RELATED SCIENCE NEEDS

Scenarios

The use of scenarios was identified by the NSSI Oversight Group as a potentially important tool in helping identify future research and monitoring needs. Scenarios can provide a means to identify a plausible range of pathways by which an uncertain future may unfold. In that way, they can then be used to help guide agency considerations for how to effectively target research and monitoring efforts in a manner that will be most useful for resource management decision-making under uncertain future conditions. A collaboration to undertake that scenarios project was formed between NSSI, the University of Alaska Fairbanks, and GeoAdaptive, LLC, an internationally experienced geospatial scenarios consultant. The focal question for the scenarios effort is:

“What is the future of energy development, resource extraction, and associated support activities on the North Slope and adjacent seas through 2040?”

The process will move from scenarios to strategies – all involved will help develop the plausible stories (scenarios) of future U.S. Arctic development; then we will assess the science needed to understand the implications of each scenario so that regardless of which scenario comes to pass, NSSI member agencies will be prepared with strategies to collect the appropriate information to make effective decisions.

Related files:

- [North Slope Scenarios Flyer](#)
- [North Slope Scenarios Fact Sheet](#)

NSSI WEBSITE

(<http://northslope.org>)

Partners:
UAF-GINA

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Partners: Alaska, NOAA, BOEM, USGS, Arctic Slope Regional Corp., etc.

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NORTH SLOPE SCIENCE CATALOG

(<http://catalog.northslope.org>)

Welcome to the North Slope Science Catalog

The North Slope Science Catalog has been developed by the North Slope Science Initiative (NSSI) to facilitate the discovery and distribution of science based data and information products. NSSI is an intergovernmental effort that promotes scientific collaboration to address research, inventory, and monitoring needs on the North Slope of Alaska. The goal of Catalog and NSSI is to provide access to data and information resources that promote science-based research and management within the North Slope as well as contribute to a better understanding of the circum-arctic region.

Search

Data and Projects

Explore

Popular Products

NSSI

NSSI Website

Additional North Slope Science Information

Landcover Data

Permafrost Data

Climate Hydro Data

Realtime Data

November Vegetation
The Alaska (AAVA) is a the AVA is t

Sept. 21, 2014 Knowledge
This docum guide provic and support

September Geocology
The Alaska NASA's Arc Experiment [more...](#)

August 28, 2014
BOEM has i Studies Pro (ESPIS) to [more...](#)

August 14, 2015 - Updates to Alaska Geospatial Data
Alaska orthoimagery, dem and hydrologic data are being updated and will provide improved resource... [Read more...](#)



Geographic Information Network of Alaska - UAF



AlaskaMapped 2.5m Orthoimagery

True color and color infrared SPOT 5 orthoimagery is available through web services for areas throughout Alaska. This effort has prioritized acquisitions over the North Slope region.

[Read more...](#) portal.gina.alaska.edu

MODIS
Suomi NPP
Statewide Orthoimagery

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(<http://northslope.org>)

Partners:
NSSI STAP

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Long Term Monitoring

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NORTH SLOPE SCIENCE INITIATIVE ALASKA

Monitoring

Monitoring Studies

Add Monitoring Study

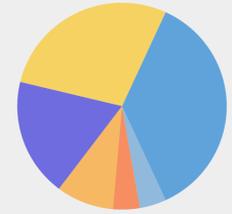
ID	Title	Status	Duration	Primary Org.	Affiliation	Topics	Subtopics	Location	Emerging Issues	Date Modified
148	Biological Monitoring at Cape Lisburn...	Ongoing	1976-present	U.S. Fish and W...	Federal	birds	seabirds	Cape ...	Species of Interest: Migrat...	Feb 20, 2014
147	Teshkepkuk Lake Area Molting Goose ...	Ongoing	1982-present	U.S. Fish and W...	Federal	birds	geese	Area ...	Species of Interest: Migrat...	Feb 20, 2014
						birds	eider	Arctic...	Species of Interest: Migrat...	Feb 20, 2014
						birds	spectacled eid...	near ...	Species of Interest: Migrat...	Feb 20, 2014
						birds, mammals	birds, foxes	Great...	None Applicable	Feb 20, 2014
						birds	swans	Great...	Species of Interest: Migrat...	Feb 20, 2014
						birds	geese	Great...	Species of Interest: Migrat...	Feb 20, 2014
						birds	birds	Great...	Species of Interest: Migrat...	Feb 20, 2014
						birds	yellow-billed L...	North...	Species of Interest: Migrat...	Feb 20, 2014
						birds	eider	Barrow	Species of Interest: Migrat...	Feb 20, 2014
						birds	snow goose	Ikplk...	Species of Interest: Migrat...	Feb 20, 2014
						birds	geese, eider, s...	Colvill...	Species of Interest: Migrat...	Feb 20, 2014
						physical	sea ice	Arctic	Changing Sea Ice Conditions	Feb 20, 2014
						physical	sea ice	Arctic	Changing Sea Ice Conditions	Feb 20, 2014
						physical	sea ice	Arctic...	Changing Sea Ice Conditions	Feb 20, 2014
						physical	sea ice	Arctic...	Changing Sea Ice Conditions	Feb 20, 2014
						physical	shoreline	Colvill...	Coastal and Riverine Erosion	Feb 20, 2014
						physical	permafrost	North...	Permafrost	Feb 20, 2014
						vegetation	tundra vegeta...	Arctic...	Coastal and Riverine Erosi...	Feb 5, 2013
						physical	shoreline	Barro...	Coastal and Riverine Erosion	Feb 20, 2014
						physical	active layer	Schoo...	Permafrost	Feb 20, 2014
						vegetation, ph...	soil, tundra ve...	Arctic...	Permafrost, Vegetation Ch...	Feb 20, 2014
						physical	soil, active layer	Barro...	Permafrost	Feb 20, 2014
						vegetation, ph...	soil, tundra ve...	North...	Fire Regime, Vegetation C...	Feb 20, 2014
						physical	active layer	Barro...	Permafrost	Feb 19, 2014
						physical	ocean currents	Arctic...	Weather and Climate, Cha...	Feb 20, 2014
						physical	inland lakes	Teshe...	Coastal Salinization, Weat...	Feb 20, 2014
						vegetation, ch...	remote sensin...	North...	Fire Regime, Vegetation C...	Feb 20, 2014

Home Statistics Study Details

View Statistics...

Proportion of Studies by Topic

Hover over a pie slice for more info
Click a pie slice to filter studies by that item



Top Topics
physical: 36% (53 Studies)
mammals: 28% (41 Studies)
birds: 18% (27 Studies)
vegetation: 9% (13 Studies)
social: 4% (6 Studies)
fish: 4% (6 Studies)
invertebrates: 0% (0 Studies)

North Slope Science Catalog

Project Tracking and Data Sharing



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 NSSI Help



Showing 1-30 of 2953 results

Enter keyword search

2013 Aerial Orthoimagery - Crea Creek Watershed Area **Data**

National Science Foundation (NSF)
 This RGB and CIR imagery comes from a high resolution LiDAR dataset of the Crea Creek Watershed Area, and is part of a series of 2013 LiDAR and imagery collections by EPSCoR Northern Test Case.

2013 Aerial Orthoimagery - Nuiqsut **Data**

National Science Foundation (NSF)
 This RGB and CIR imagery comes from a high resolution LiDAR dataset of the Nuiqsut, and is part of a series of 2013 LiDAR and imagery collections by EPSCoR Northern Test Case.

North Slope Science Catalog Collections

- Long Term Monitoring **118 results**
- NSF 2015 Import - US Arctic **176 results**
- GIS Data **84 results**
- Long Term Monitoring Candidates **101 results**
- Ongoing **585 results**
- North Slope Projects

Long-term monitoring: multiple collections of the same variable over a period of 10 yrs or longer by comparable methodology...can include projects or initiatives that have been undertaken in the last 5 yrs that are intended o continue or continue into the future...

northslope.org
catalog.northslope.org



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Facilitating Science Collaboration on Alaska's North Slope

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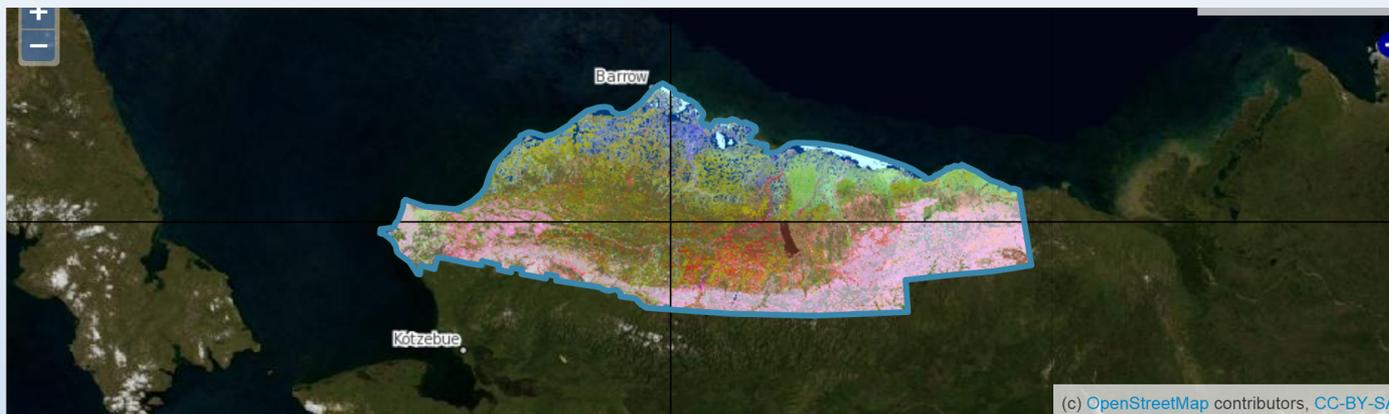
- Development Scenarios
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- Imiq Hydroclimate Database

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Partners:
DU
BLM
USFWS
ALCC

Landcover Mapping



North Slope Science Initiative

Other agencies



ALCC

DU



BLM



USFWS

Map Layers

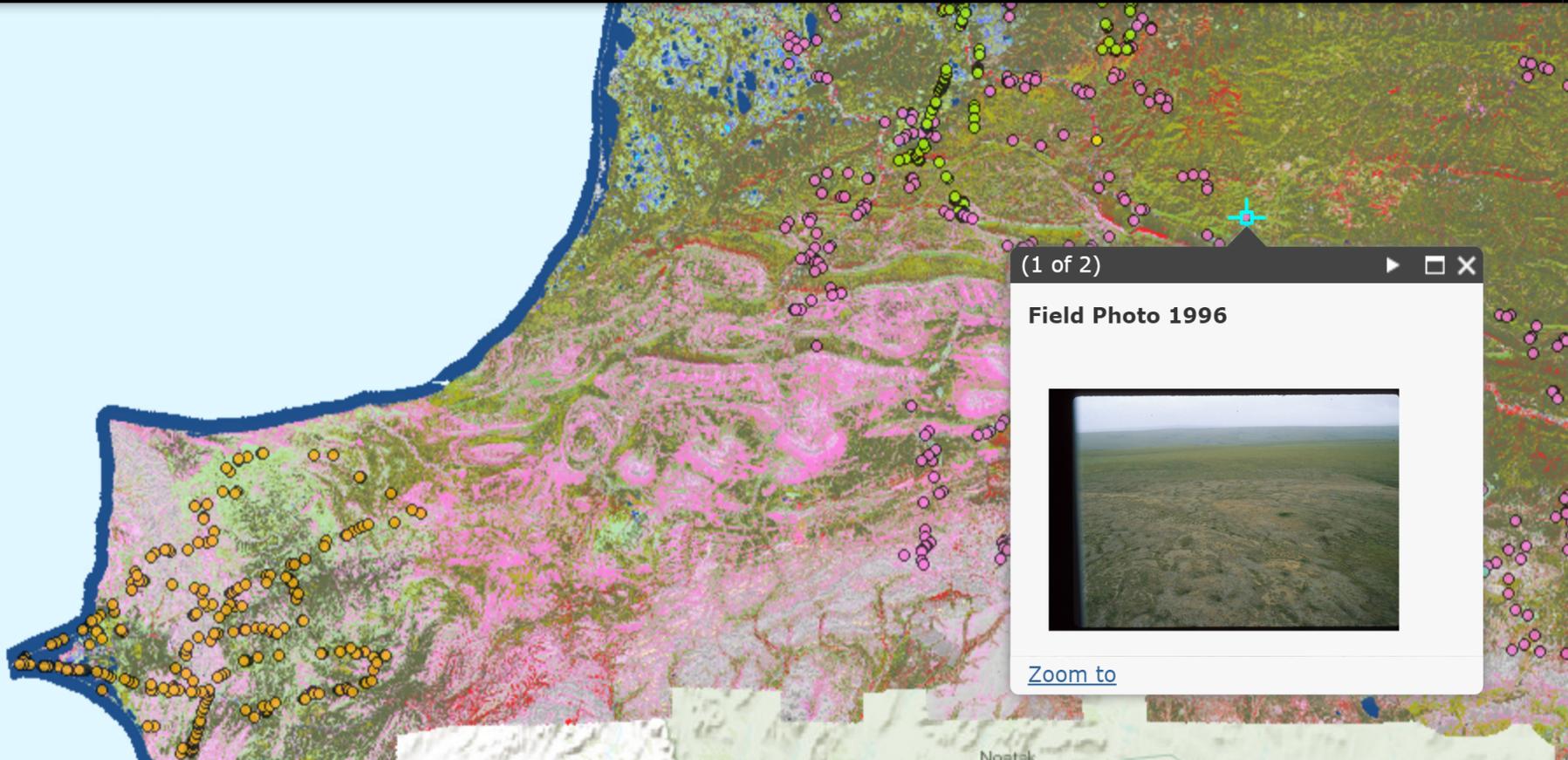


NSSI Landcover 2013

2013 NSSI Landcover for North Slope of Alaska

This map is the outcome of a multi-year project to produce a moderate resolution landcover base map for the North Slope of Alaska to serve as a primary base layer for long-term science and planning activities on the North Slope. New Landsat Thematic Mapper (TM) 30 meter resolution landcover maps were produced for the far western arctic, and for the area between the National Petroleum Reserve - Alaska (NPRA) and Arctic National Wildlife Refuge. In the NPRA, an existing land cover map from the 1990's was "crosswalked" to the NSSI land cover map classes, and a large portion of the map was updated using more recently acquired Landsat TM images. The remaining areas of the NSSI land cover map utilized an existing statewide land cover mosaic compiled by the Alaska Natural Heritage Program (AKNHP) that consisted of land cover classes that already matched the NSSI land cover classes and originated primarily from National Park Service (NPS) and U.S. Fish and Wildlife (FWS) land cover maps. Twenty four classes are identified in the map, covering approximately 60 million acres (24.3 million hectares) stretching from the border of Canada to the western arctic coast and from the Arctic Ocean south to the Brooks Range.

The raster land cover map is provided as a .img file. The Final Report is also provided.



(1 of 2) [Close] [Fullscreen]

Field Photo 1996

[Zoom to](#)



Partners:
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Permafrost Mapping
Ecological Landscapes



(c) OpenStreetMap contributors, CC-BY-SA

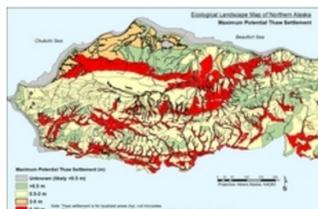


Arctic Landscape Conservation Cooperative

Other agencies



Record Previews



2014 - Permafrost Database Development, Characterization and Mapping for Northern Alaska (Ecological Mapping Update)

Permafrost is a unique characteristic of polar regions and high mountains and it is fundamental to geomorphic processes and ecological development in those environments. Despite the critical importance of permafrost to ecosystem responses to climate change, permafrost characteristics of Alaska have been mapped in only generalized regional maps or site-level terrain unit maps for engineering design and assessment. This mapping effort provides an intermediate-level mapping of permafrost throughout Northern Alaska and is intended to improve landscape-level assessments, regional climate impact modeling and prediction. Permafrost has been mapped through correlation with mapping of terrain units, airborne electromagnetic (AEM) surveys and modeling of soil temperatures from terrain conditions.

GIS data are provided for download in geodatabase and shapefile format and contain the following layers: permafrost extent, thermokarst landforms, maximum settlement potential, massive ice, segregated ice, biome, ecoregion, ecological subsection, ecological section, ecological landscape, soil landscape, physiography, lithology, general geology, average elevation (m), and mean annual air temperature (c). ARCGIS layer files are also included in this download/

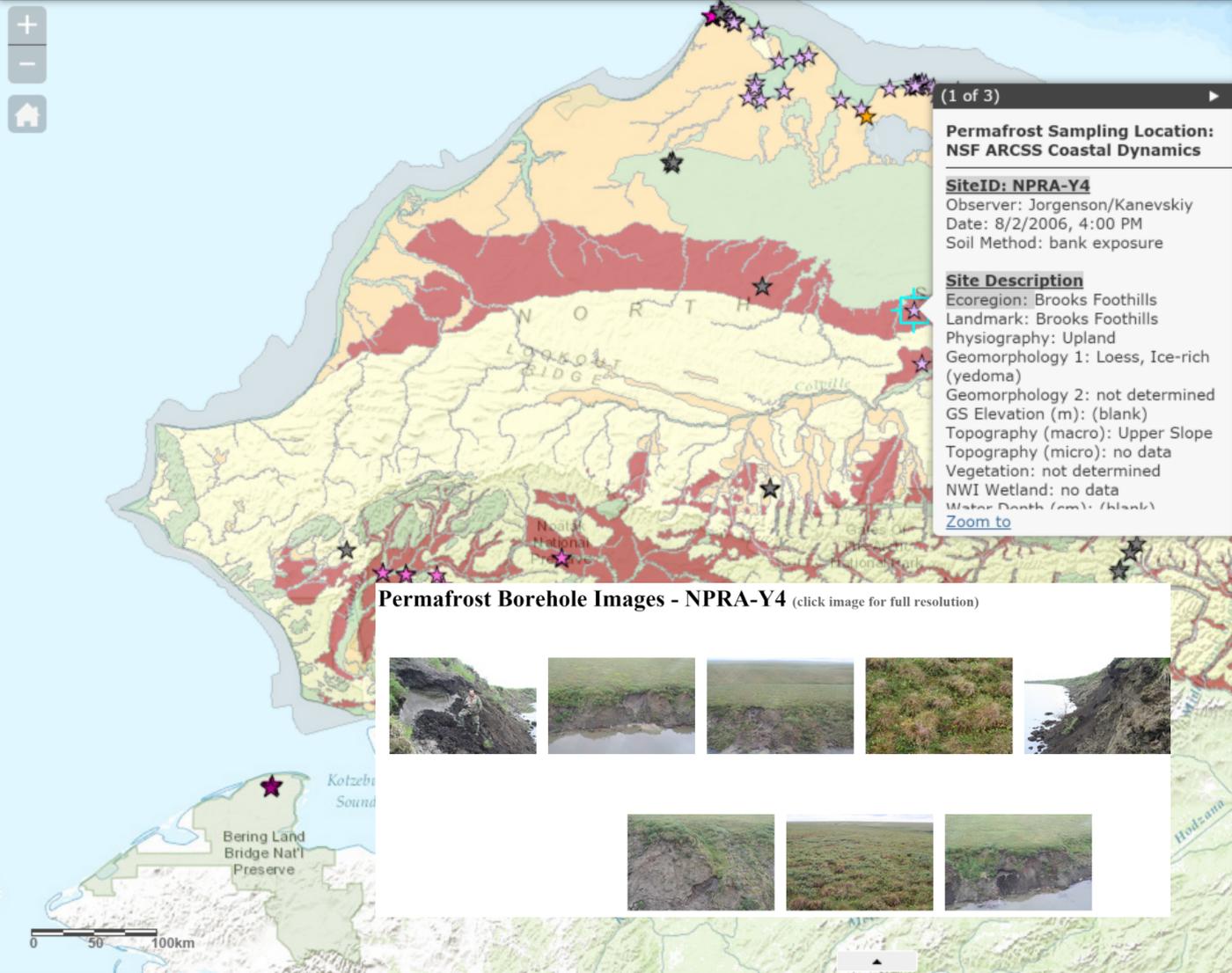
Data for 861 permafrost boreholes throughout the North Slope were compiled. All public access data are available for download as an Access database. The data are also provided in a web mapping tool available from the Catalog home page under Additional North Slope Information or see website link below.

The project final report is provided for download (Final Report updated June 8, 2015).

Note: This revision updates "Landscape Level Ecological Mapping of Northern Alaska (NOAK) and Field Site Photography - 2014 Update" (<http://catalog.northslope.org/catalogs/9549>).

Data and Resources

Ecological landscapes
 Permafrost/thermokarst
 Max Settlement Potential
 Massive Ice
 Segregated Ice
 More...



(1 of 3)

**Permafrost Sampling Location:
NSF ARCSS Coastal Dynamics**

SiteID: NPRA-Y4
 Observer: Jorgenson/Kanevskiy
 Date: 8/2/2006, 4:00 PM
 Soil Method: bank exposure

Site Description
 Ecoregion: Brooks Foothills
 Landmark: Brooks Foothills
 Physiography: Upland
 Geomorphology 1: Loess, Ice-rich (yedoma)
 Geomorphology 2: not determined
 GS Elevation (m): (blank)
 Topography (macro): Upper Slope
 Topography (micro): no data
 Vegetation: not determined
 NWI Wetland: no data
 Water Depth (cm): (blank)
[Zoom to](#)



Legend

Permafrost Sample Sites

- NoAk_Permafrost_Sites_1015_epsg3857
- ★ ADGGS Surficial Geology
- ★ ADOT Arctic Transportation Planning Geophysics
- ★ ARCO Geomorphology Study
- ★ CPAI NPRA Environmental Studies
- ★ EPSCOR Permafrost Vulnerability
- ★ FWS AWRN Long-term monitoring
- ★ NSF ARCSS Coastal Dynamics
- ★ NSF ARCSS Thermokarst
- ★ NSF Ice-wedge degradation
- ★ NSF Permafrost Dynamics
- ★ UAF Palmer Soil Lab Surveys

MaxSettlementPot

NoAK_pfmasettlementpot

- Unknown (likely <0.5 m)
- <0.5 m
- 0.5-2 m
- 2-5 m
- 5-30 m



Kotzebue Sound
 Bering Land Bridge Natl Preserve

Hovdzanna

Funding:
NFWF

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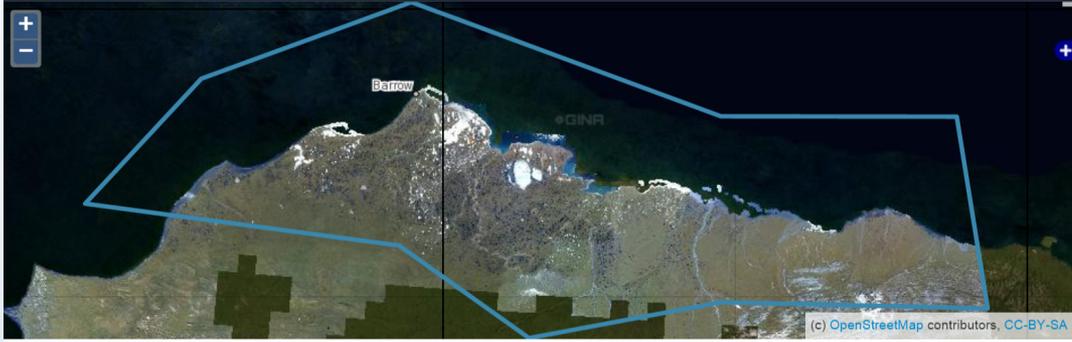
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Winter Liquid Water



(c) OpenStreetMap contributors, CC-BY-SA

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**Geographic Information
Network of Alaska-
University of Alaska
Fairbanks**

Other agencies



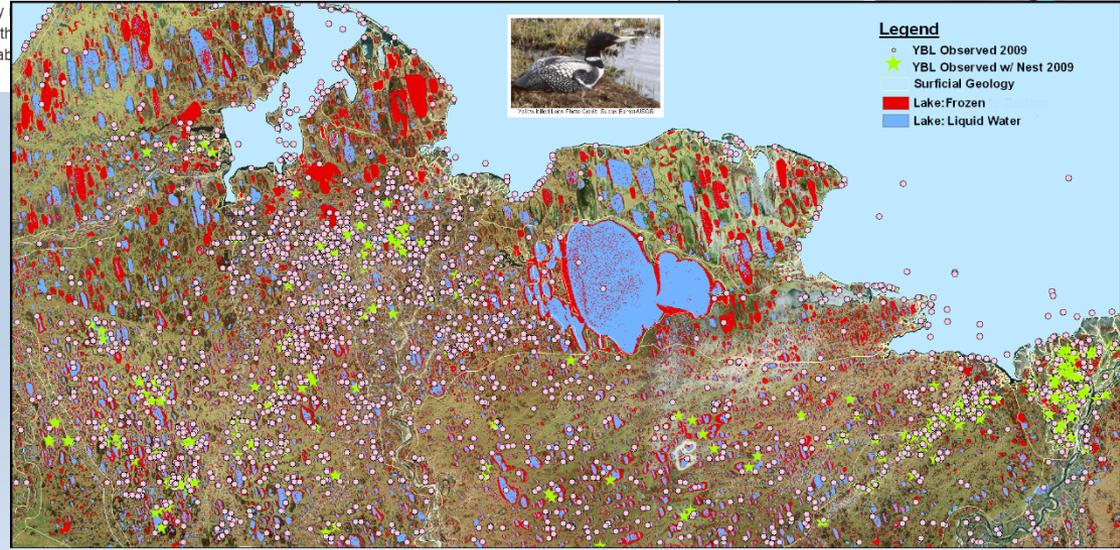
Mapping Winter Liquid Water Availability (R1) for Lakes on the North Slope Coastal Plain of Alaska Using Synthetic Aperture Radar (SAR)

Report: documents the materials, methods and results of this project.

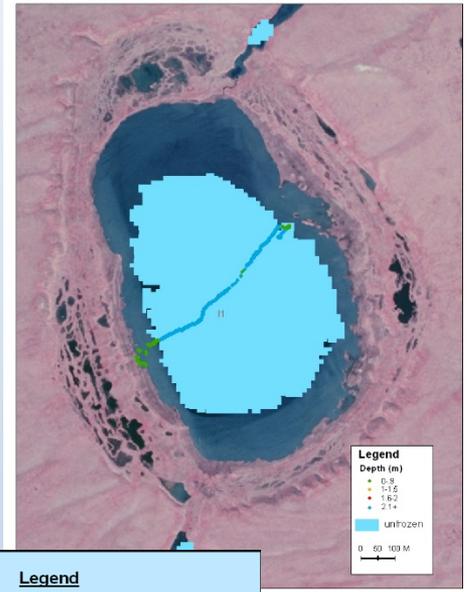
The North Slope coastal plain represents a unique landscape that is characterized by permafrost and an immense number of freshwater lakes of varying sizes and depths. These lakes provide habitat for fish and wildlife species, support subsistence resources for use by local populations, and serve as freshwater supply for industrial development. The ability of resource managers to effectively balance these uses depends on our understanding of the capacity of these lakes to serve as water storage and as well as our understanding of their function as habitat.

During winter, lakes on the coastal plain typically freeze to a depth of about 1.6-2.2m, with deeper lakes retaining liquid water. The identification of deep lakes that contain unfrozen water can help define critical fish overwintering habitat. A variety of anadromous and resident fish species, including sticklebacks, salmonid, whitefish and blackfish overwinter in lakes on the coastal plain. These fish are important subsistence resources as well as important forage fish for migratory bird species such as the yellow-billed loon (YBL, *Gavia adamsii*).

The primary
throughout the
water availab
2009.



- Legend**
- YBL Observed 2009
 - ★ YBL Observed w/ Nest 2009
 - Surficial Geology
 - Lake: Frozen
 - Lake: Liquid Water



- Legend**
- Depth (m)
- 0-0.9
 - 1-1.5
 - 1.6-2
 - 2-1+
- unfrozen
- 0 50 100 M



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- Emerging Issues
- Long-term Monitoring
- Landcover Mapping
- Permafrost Mapping
- Winter Water Availability
- Imiq Hydroclimate Database

NEWS AND UPDATES

- Arctic Daily Update: Friday, 1/15
- The Arctic This Week

Partners:
ALCC
USFWS
UAF

Hydroclimate Database



Imiq Data Portal

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DFM4 Northwest Kuparuk Met

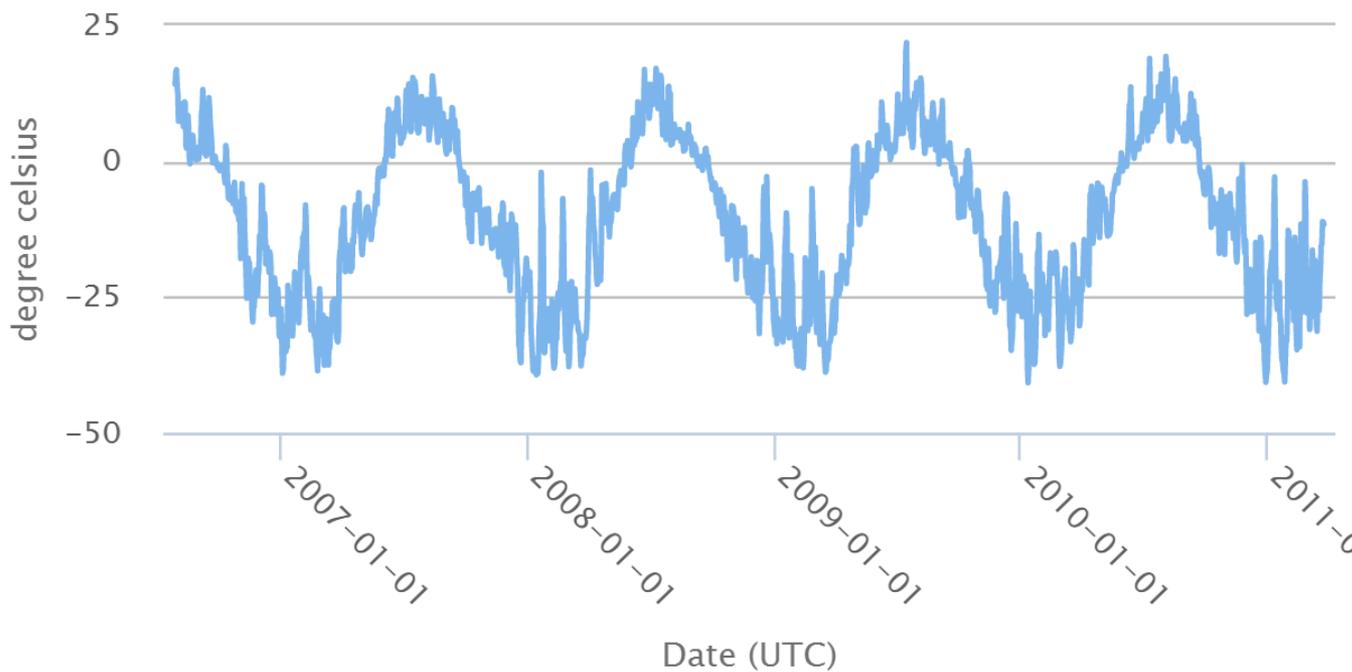
Site

Air temperature

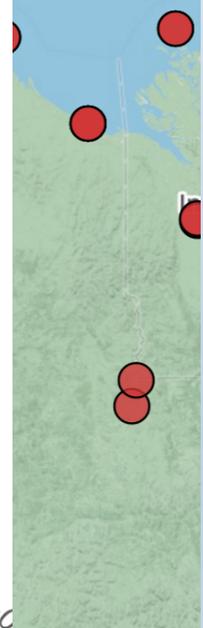
Precipitation

More ▾

Daily air temperature



i Sea





Partners???

Continuing research and monitoring

Alaska Natural Heritage Program-UAA

Alaska Center for Conservation Science-UAA

1. Infrastructure mapping-disturbance
2. Invasive species
3. Hydrology (NHD update-lakes)



Thank You

Dennis Lassuy
dlassuy@blm.gov

Jess Grunblatt
jgrunbla@alaska.edu
(907) 786-6353

northslope.org
catalog.northslope.org