



NSF

**ARCTIC  
Data  
Center**

<https://arcticdata.io>

 @arcticdatactr

# the Arctic Data Center



**DataONE**

NSF Award #1546024

Amber Budden



0000-0003-2885-3980

Arctic Data Center Data Science Training  
February 11-15, 2019



the **Arctic Data Center,**  
**NSF Standards & Policies**





Troms Fylke



Rama



Detroit Publishing Co.



# Features and Services

- **Data Archive**
- **Portal** for data discovery
- **Tools & Infrastructure**
  - *Data and metadata submission*
  - *Provenance features*
  - *Replication features*
  - *Metadata quality check*
- **Support Services**
- **Training & Outreach**
- **Data Rescue**





# Team



M. Jones



Baker-Yeboah



Budden



Casey



Dozier



Schildhauer



Walker



C. Jones



Mecum



Clark



Goldstein



Li



Mullen



Chong



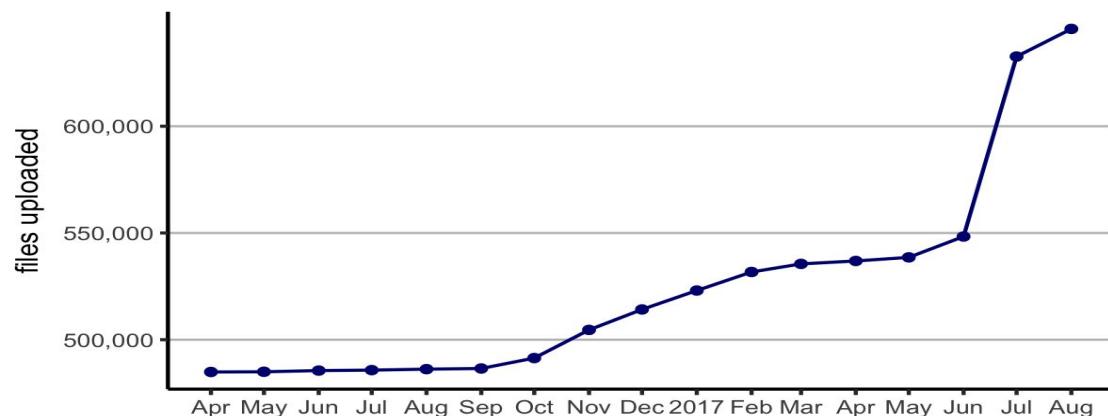
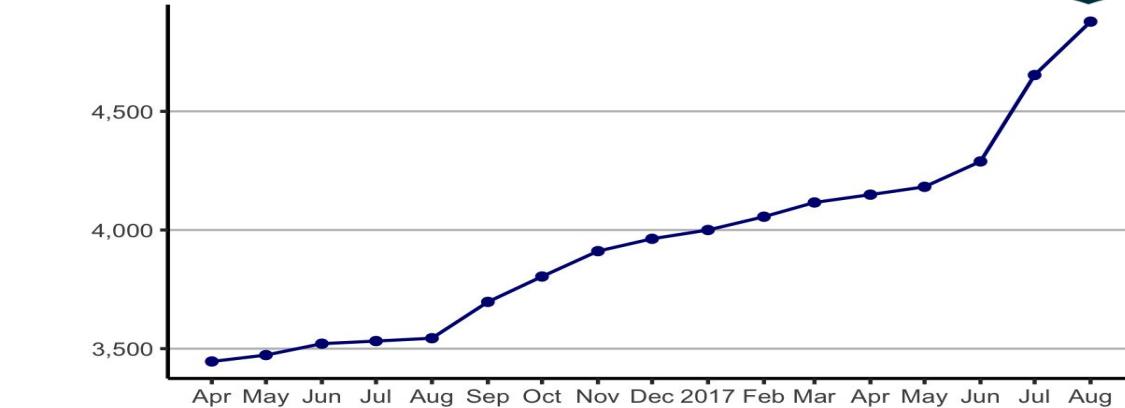
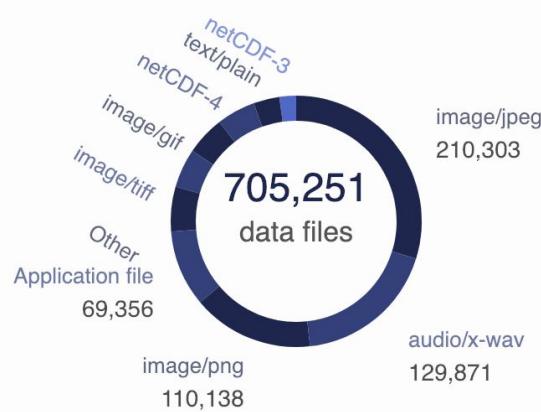
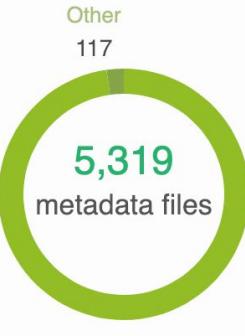
# Data Archive





# Data archive growth

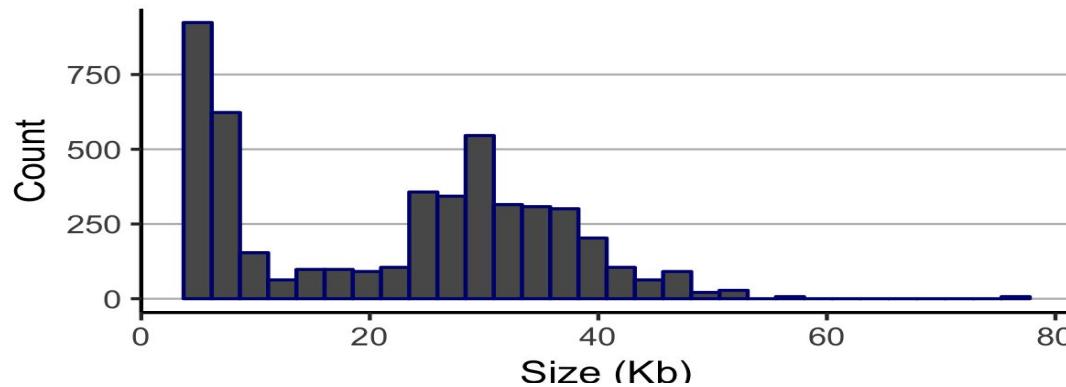
4 to 27 TB



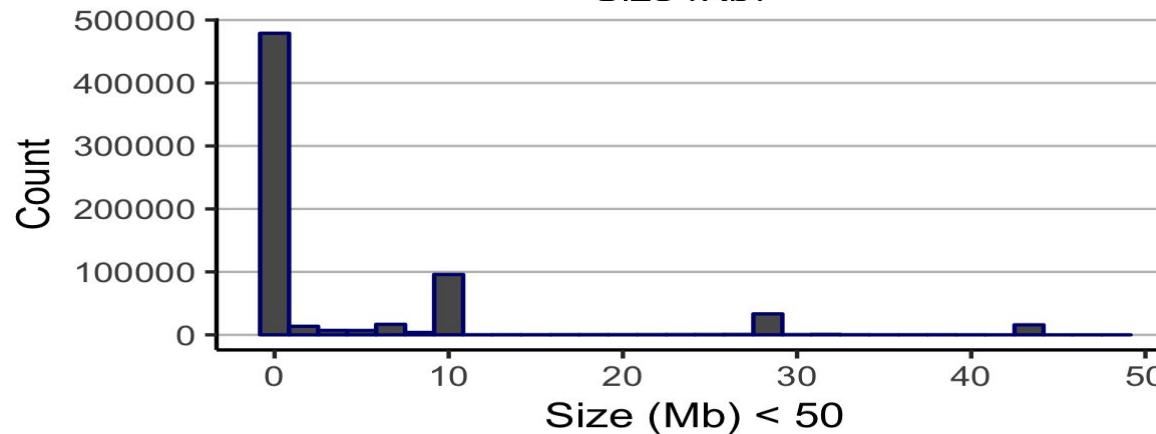


# Size distribution

Metadata

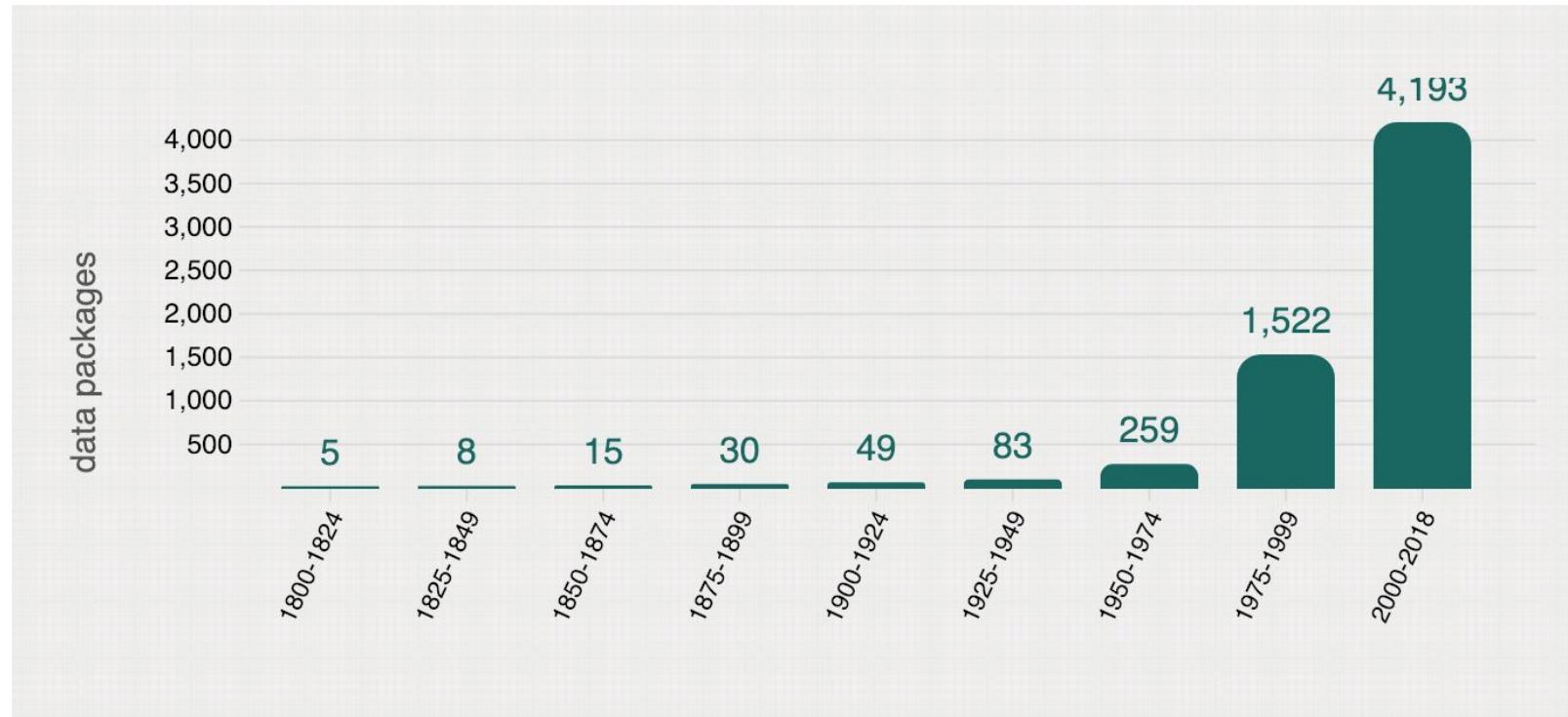


Data  
(< 50MB)





# Data by time period





# Pan-Arctic Data





# Data Discovery Portal

<https://arcticdata.io/catalog/>



Search

Search phrase

Filter by:

Data attribute

density, length, etc.

Creator

Year

1800 2018

Data coverage

Publish year

Identifier

Taxon

Location

Data

Support

About

Community

Submit Data

Sign in with Orcid

## DATASETS 1 TO 25 OF 5,289

1 2 3 ... 212 Next

Sort by Most recent

DETLEV HELMIG, Brendan Blanchard, and Daniel Obrist. 2018. **Soil, snow, and atmosphere exchanges of mercury in the interior Arctic tundra, Alaska.** Arctic Data Center. doi:10.18739/A21Z41S5S.

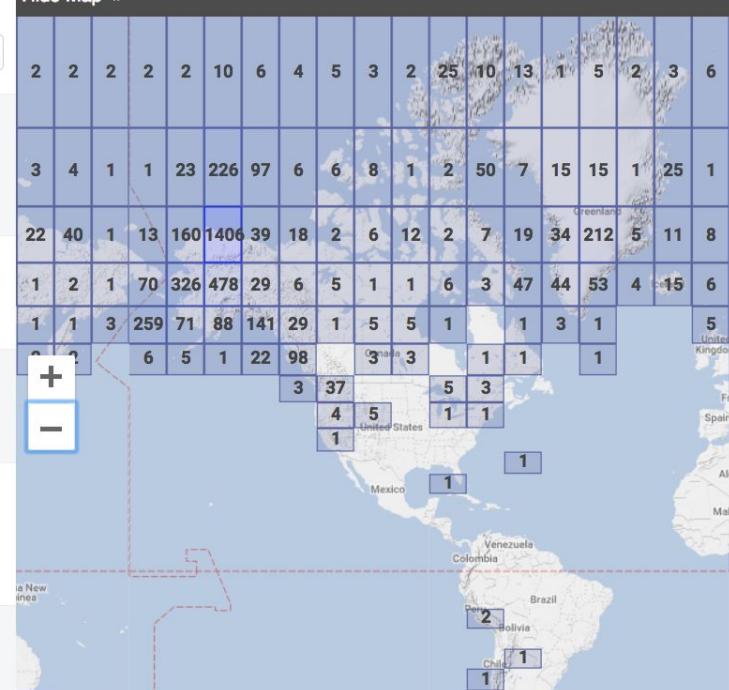
Carrie Morrill. 2018. **Code for lake energy and water balance model, Toolik Lake, Alaska, 2018.** Arctic Data Center. doi:10.18739/A2BC3SW87.

Jason Briner. 2019. **Holocene sediment physical properties in four southwest Greenland lakes, 2016-2018.** Arctic Data Center. doi:10.18739/A2MW28D81.

Sarah Das, Luke Trusel, and Matthew Osman. 2018. **Ice sheet and ice cap firn core physical and chemical stratigraphy, Disko Bay region, GreenLand, 2014-2015.** Arctic Data Center. doi:10.18739/A2X921J1G.

Joseph R. McConnell. 2018. **Aerosol and chemical measurements from ice cores, Summit, Greenland, 1446-1763.** Arctic Data Center. doi:10.18739/A26T0GW17.

Hide Map





# Data Discovery Portal

<https://arcticdata.io/catalog/>



Data Support About Community Submit Data

Sign in with Orcid

Search

Search phrase

Filter by:

- Data attribute
- Creator
- Year 1800 2018
- Data coverage
- Publish year
- Identifier
- Taxon
- Location

## DATASETS 1 TO 25 OF 5,289

1 2 3 ... 212 Next

Sort by Most recent

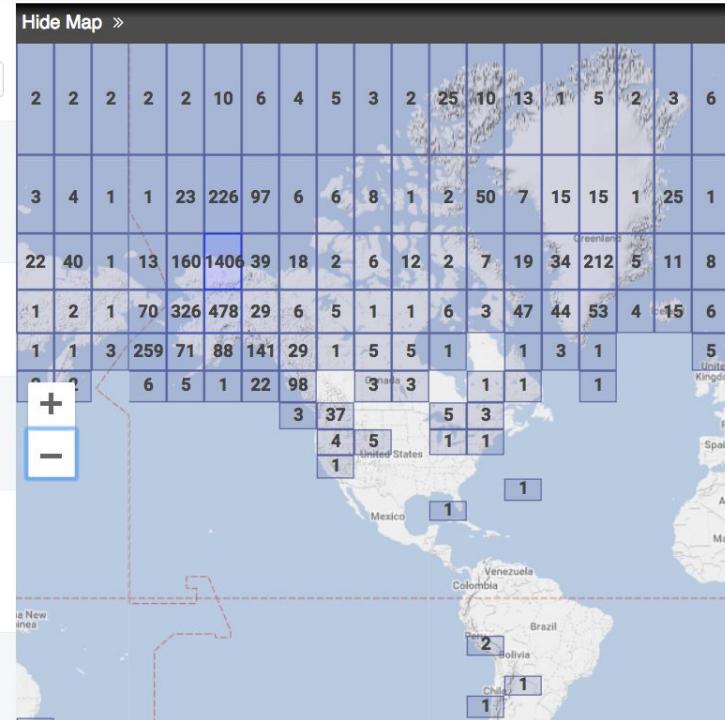
DETLEV HELMIG, Brendan Blanchard, and Daniel Obrist. 2018. **Soil, snow, and atmosphere exchanges of mercury in the interior Arctic tundra, Alaska.** Arctic Data Center. doi:10.18739/A21Z41S5S.

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# Data Discovery Portal



Sarah Das, Luke Trusel, and Matthew Osman. 2018. Ice sheet and ice cap firn core physical and chemical stratigraphy, Disko Bay region, GreenLand, 2014-2015. Arctic Data Center. doi:10.18739/A2X921J1G.



Citations 0

Downloads 0

Views 0

Copy Citation

Quality report

Files in this dataset Package: resource\_map\_doi:10.18739/A2X921J1G

Name	File type	Size	Download All
Metadata: Disko Bay Project, Greenland: ice sheet and ice cap firn core physical and chemical stratigraphy.xml	EML v2.1.1	65 KB	
gw2014_melt_vs_depth.csv	More info	text/csv 631 B	
nu2015_melt_vs_depth_nov2017.csv	More info	text/csv 19 KB	
gc2015_density.csv	More info	text/csv 33 KB	

Show 6 more items in this data set

## General

Identifier doi:10.18739/A2X921J1G

Abstract This dataset is comprised of physical and chemical stratigraphic records from firn cores collected on the western flank of the Greenland Ice Sheet, and ice caps on Disko Island, Greenland and the Nuussuaq Peninsula, Greenland. The cores were collected in support of the NSERC-CIAC Collaborative Research Investigating the Influence of Oceanic...



# Tools and Infrastructure



Anna K. Liljedahl. 2017. Groundwater levels and temperature, Delta Junction, Interior Alaska, 2014-2016. urn:nodenode:ARCTIC. doi:10.18739/A2RV0D050.

Citations 0 Downloads 55 Views 301 Copy Citation Quality report

Files Untitled dataset

Add files to start your dataset + Add Files

Overview

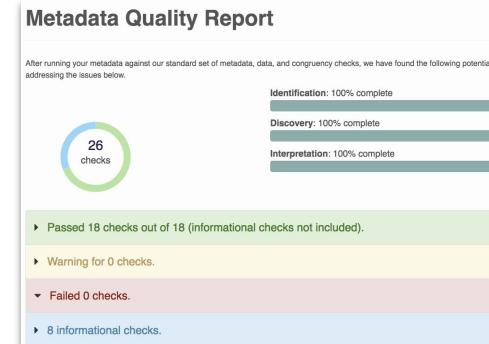
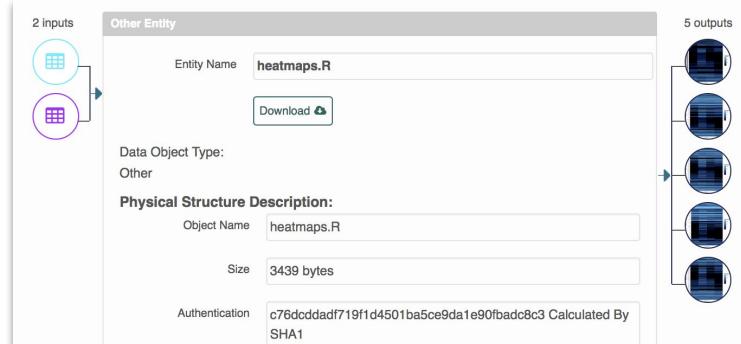
People

Dates

Locations

Taxa

Methods



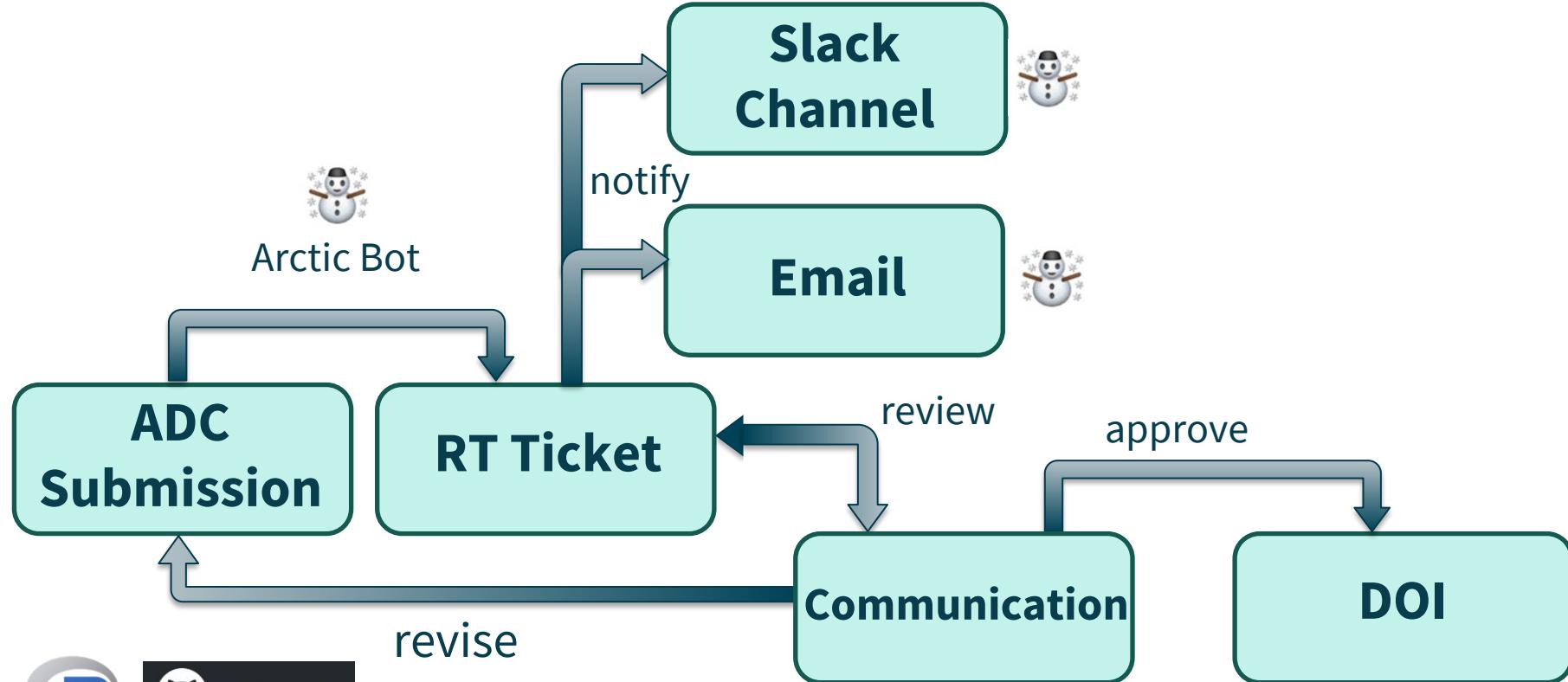


# Support Services





# Support Systems





# Support Team ([support@arcticdata.io](mailto:support@arcticdata.io))



Clark



Goldstein



Mullen



Chong



Monper



Pruett



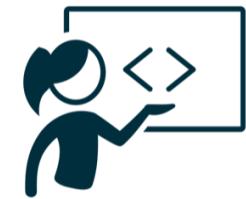
Sun



Student Interns

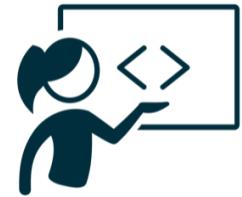


# Training and Outreach





# Training and Outreach

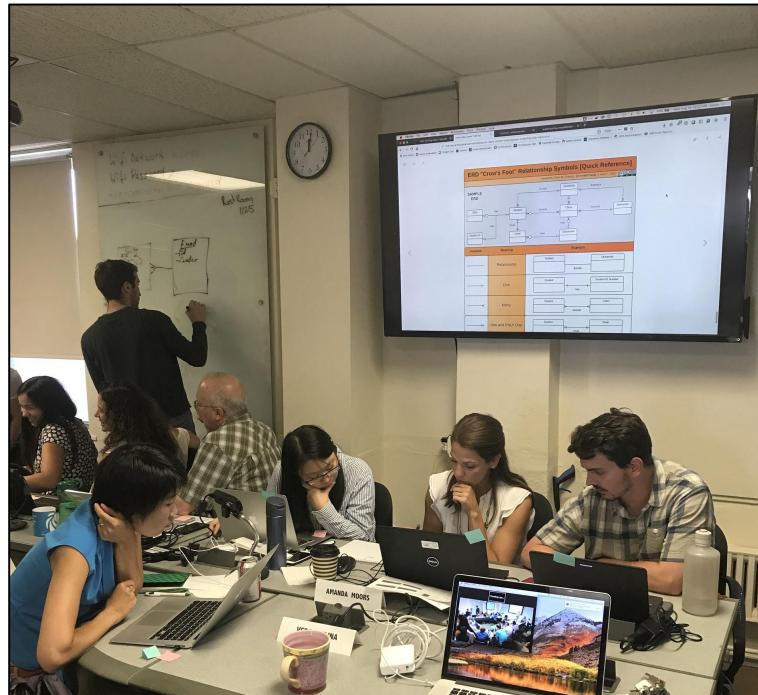
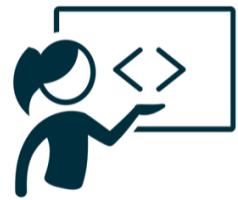


- Training
  - Trainings
  - Workshops
  - Internship Program
  - Data Fellows Program
  - Webinars



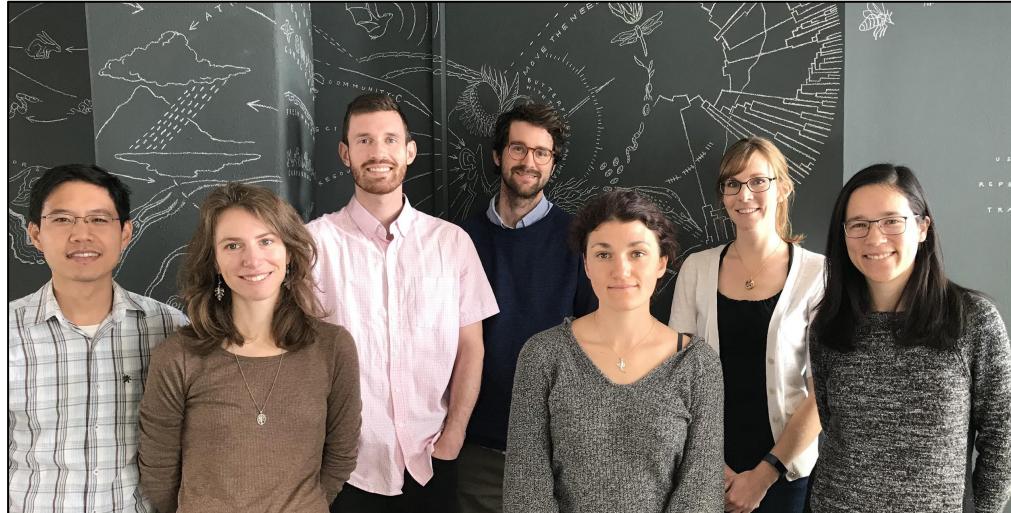
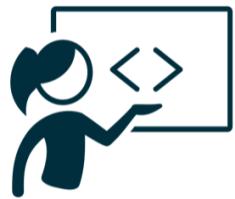


# Arctic Data Science Training





# Data Science Fellowship



 **NCEAS**  
National Center for Ecological Analysis and Synthesis

About    Research    Informatics    Opportunities    News    Give    Contact

The Next Generation of Environmental Scientists are Data Scientists

NCEAS Portraits: Data Science Fellow Edition



**Rachel Carlson Leveraged the Power of Data Sharing**  
"I think data science is a great example of using 21st-century tools to address 21st-century environmental problems."

[More](#)



**Steven Chong Improved Carbon Data Accessibility**  
"My professional goal is to build a career that makes biological information more accessible and user-friendly."

[More](#)



**Emily O'Dean Reenergized Her Passion for Mixing Software and Science**

"Working at NCEAS has made me really excited about utilizing my computer science knowledge in the context of ecological research."

[More](#)



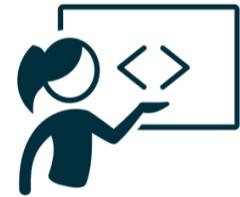
**Stephanie Freund Indulged Her Satisfaction in Well-Prepared Datasets**

"I believe that principles of open science are widely applicable for both scientific research and its applications."

[More](#)



# Training and Outreach

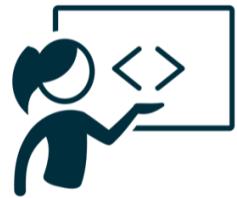


- Outreach
  - In-person events
  - News items and other communications
  - Social media
  - Arctic Data Center website



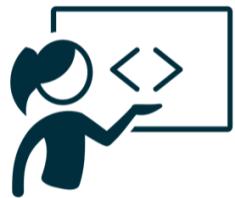


# Data Training & Outreach





# Dataset Highlights



## Dataset Highlight: Phenological Mismatch in the Arctic, with Dr. Kathy Kelsey

By Kathryn Meyer

**Citation:** Katharine Kelsey. 2017. Methane and nitrous oxide fluxes as a function of the timing of goose grazing, Yukon Kuskokwim Delta, Alaska, 2016. Arctic Data Center. doi:[10.18739/A28J6F](https://doi.org/10.18739/A28J6F).

**Highlight:** “These data are critical for understanding how climate-induced changes in the timing of migratory herbivore grazing should be included in projections of the role of Arctic and Subarctic ecosystems in the global climate system,” – Dr. Kathy Kelsey.

Phenological mismatch is when the timing of food and/or habitat availability for a species is altered relative to that which that species is accustomed. It's also a phenomenon becoming more prevalent in a changing climate. As climatic changes lead to an earlier spring in the Arctic and many other parts of the world, the timing of herbivore migration and grazing is also changing. Dr. Kathy Kelsey, a Postdoctoral Fellow at the University of Alaska, Anchorage, and her team led by Principal Investigators Dr. Karen Beard, Dr. Jeffrey Welker and Dr. Joshua Leffler, know this well.



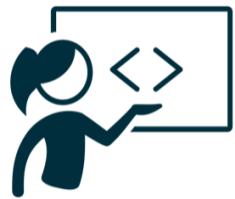
Dr. Kathy Kelsey collecting greenhouse gas data. PC: Ryan T. Choi

But while phenological mismatch is known to have effects on herbivore populations, Kelsey and her team are specifically investigating how these timing changes affect interactions between the biosphere and the atmosphere. To do this, they collected data on the exchange of greenhouse gases, including carbon dioxide ( $\text{CO}_2$ ), methane ( $\text{CH}_4$ ) and nitrous oxide ( $\text{N}_2\text{O}$ ), between the ecosystem and the atmosphere. This particular dataset helps to understand how changes in the timing of the growing season and the timing of goose grazing affect greenhouse gas fluxes.

Addressing their research questions really is a team effort. To collect and analyze their own data, Kelsey's team relied on other available data – including data on geese arrival,



# Social Media & Marketing



The screenshot shows the Arctic Data Center website. At the top, there's a navigation bar with links for 'Data', 'Support', 'About', 'Community', 'Submit Data' (in a green button), and 'Sign in with ORCID'. Below the navigation is a large banner image of snow-covered mountains. Overlaid on the banner are two buttons: 'Search for Data' and 'Submit New Data'. A section titled '2019 Arctic Data Center Data Science Trainings' includes a brief description of the trainings and a link to 'Read more >'. The overall theme is Arctic research data and software.



28 September 2018 Issue

## Highlighting the Stories and People Behind Preserved Arctic Data

The Arctic Data Center has recently established a Dataset Highlights page. The Dataset Highlights page provides insights directly from the researchers, including how their data might be applied to other questions in support of Arctic research. The six datasets highlighted here are from studies of Arctic soil bacteria, Arctic river geochemistry, Indigenous subsistence harvest, local community response to ecosystem change in the Bering Sea, the habitability of fragile rotten ice, and phenological mismatch in the Arctic.

By: Kathryn Meyer, Community Engagement and Outreach Coordinator at the Arctic Data Center



 @arcticdatactr

The screenshot shows the Twitter profile of the Arctic Data Center (@arcticdatactr). The profile picture is the same green and blue wave logo. The bio reads: 'The primary data repository for the Arctic section of @NSF OPP. Check out the Arctic data, trainings, and tools at arcticdata.io'. The stats show 196 tweets, 133 following, 313 followers, 191 likes, 0 lists, and 0 moments. The timeline shows several tweets, including one from Matthew Shupe (@matthewshupe) about the MOSAiC Expedition, and another from Jen T (@JenTARCUS) about Arctic Indigenous scholars. The bottom of the screen shows a banner for 'Empowering Arctic Indigenous Scholars' with an image of the US Capitol building.



# Data Rescue

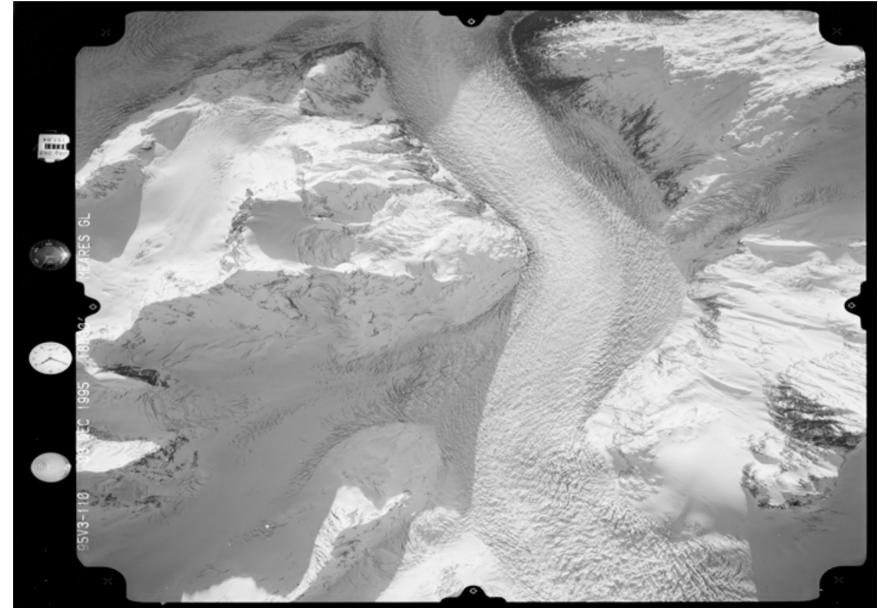




# Data Recovery: Aerial Glacier Photos



- Austin Post's collection
- 1964 – 1997
- 2 - 6 rolls per year
- 100,000+ files = 4.9 TB
  - Glacier photos:  
TIFs, JPGs, TNs
  - Reconstructed flight paths, images of notes, image metadata, camera specs



*Meares Glacier, Prince William Sound, AK  
61.187448, -147.457573, taken from 18,000'  
December 3, 1995, Roll 3, Frame 110  
doi:10.18739/A2FF6Z (NAGAP\_95V3\_110.jpg)*



the Arctic Data Center,  
**NSF Standards & Policies**



# Who Must Submit

<https://arcticdata.io/submit/#who-must-submit>

## Arctic Research Opportunities (ARC):

- Complete metadata and all appropriate data and derived products
- Within 2 years of collection or before end of award, whichever comes first

## ARC Arctic Observing Network:

- Complete metadata and all data
- Real-time data made public immediately
- Within 6 months of collection



# Who Must Submit: Social Sciences

<https://arcticdata.io/submit/#who-must-submit>

## Arctic Social Sciences Program (ASSP):

- NSF policies include special exceptions for ASSP and other awards that contain sensitive data
- Human subjects, governed by an Institutional Review Board, ethically or legally sensitive, at risk of decontextualization
- Metadata record that documents non-sensitive aspects of the project and data
  - *Title, Contact information, Abstract, Methods*



# Terms of Use: Licensing and Distribution

<https://arcticdata.io/submit/#license-and-data-distribution>

All metadata and (non-sensitive) data will be released under either:



CC-0 Public Domain Dedication:

*“...can copy, modify, distribute and perform the work, even for commercial purposes, all without asking permission.”*



Creative Commons Attribution 4.0 International License:

*“...free to...copy,...redistribute,...remix, transform, and build upon the material for any purpose, even commercially,...[but] **must give appropriate credit**, provide a link to the license, and indicate if changes were made.”*



# Data Citation

- We assign a DOI to each published data set
- Researchers should cite data they use

Anna K. Liljedahl. 2017. Groundwater levels and temperature, Delta Junction, Interior Alaska, 2014-2016. urn:nodenode:ARCTIC. doi:10.18739/A2RV0D050.

Citations

0

Downloads

55

Views

301

Copy Citation

Quality report

- We are working as part of Make Data Count to track the citations to data





# Data Citation

- Each update has a unique identifier
- Cite the exact version used
- Newer versions are clearly indicated

The screenshot shows the Arctic Data Center website. At the top, there is a navigation bar with the NSF Arctic Data Center logo, links for Data, Support, and About, a green "Submit Data" button, and a "Sign in with Orcid" button. A yellow banner at the top of the main content area says "⚠ NOTE: A newer version of this dataset exists". Below the banner, the URL "Home / Search / Metadata" is visible. The main content displays a dataset entry for "At-sea density of foraging little auks (Alle alle) near Hornsund Fjord". The entry includes the authors (Nina J. Karnovsky, Pomona College, Ann M. A. Harding, Environmental Science Department, Alaska Pacific University, and UCAR/NCAR - Earth Observing Laboratory), the year (2016), the title, the source (Arctic Data Center), the identifier (urn:uuid:849a7036-8dc4-400e-a584-9d1aaafacca63), and a small circular icon with a plus sign.

⚠ NOTE: A newer version of this dataset exists

Home / Search / Metadata

Nina J. Karnovsky, Pomona College, Ann M. A. Harding, Environmental Science Department, Alaska Pacific University, and UCAR/NCAR - Earth Observing Laboratory. 2016. **At-sea density of foraging little auks (Alle alle) near Hornsund Fjord.** Arctic Data Center. urn:uuid:849a7036-8dc4-400e-a584-9d1aaafacca63.



the Arctic Data Center,  
NSF Standards & Policies,  
**Summary**



# Arctic Data Center Features and Services



Data Archive



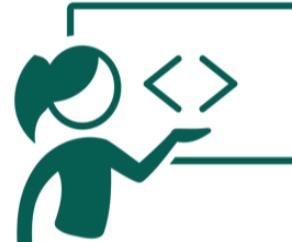
Data Discovery Portal



Tools and Infrastructure



Support Services



Training and Outreach



Data Rescue



# Operation Metrics



**5,300+**  
DATA SETS



**1,700**  
CREATORS



**705K+**  
DATA FILES



**9,300+**  
USERS



**31 TB**  
DATA STORAGE



**258K+**  
FILE DOWNLOADS



NSF

**Arctic  
Data  
Center**

**<https://arcticdata.io>**