



<https://arcticdata.io>



@arcticdatactr

# the **Arctic Data Center**

Kathryn Meyer



0000-0003-0200-0787

NSF Award #1546024



Arctic Data Center Data Science Training

January 14-18, 2019 1



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







# 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

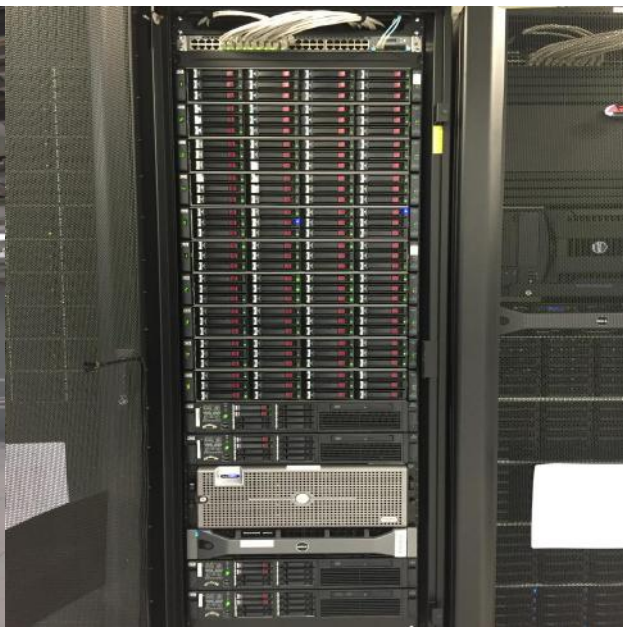


Meyer





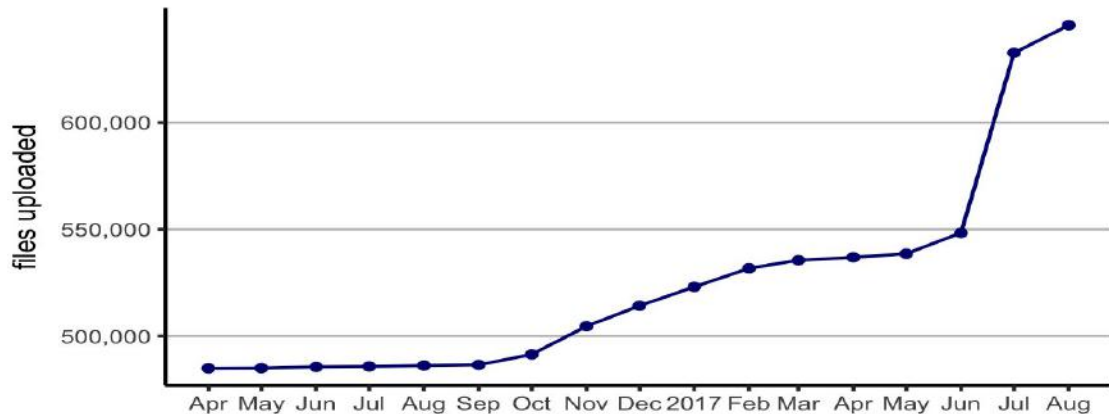
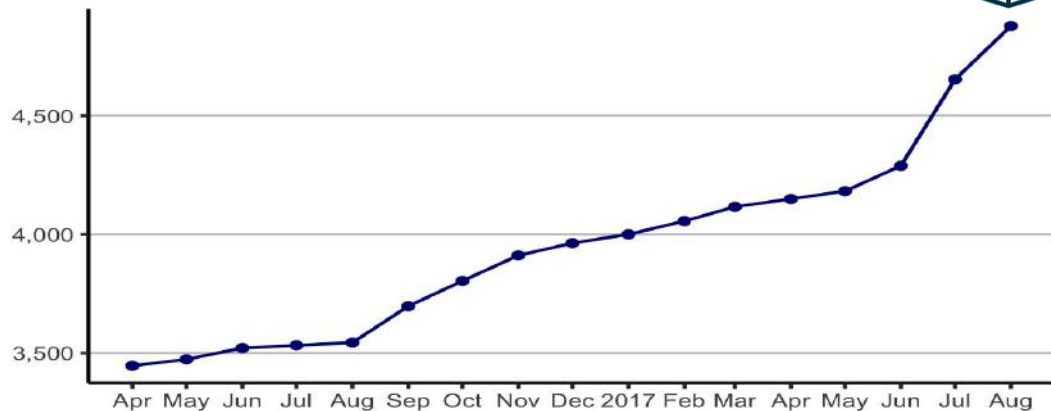
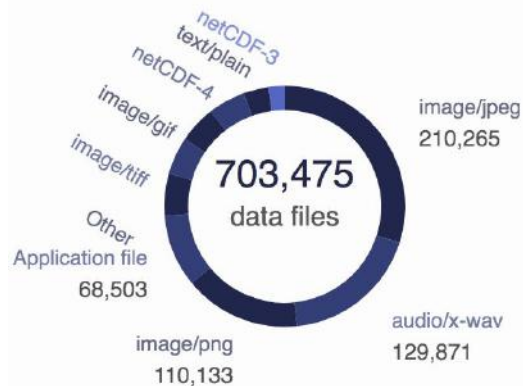
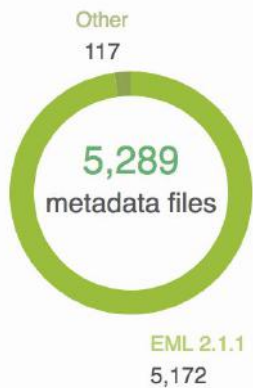
# Data Archive





# Data archive growth

4 to 26 TB



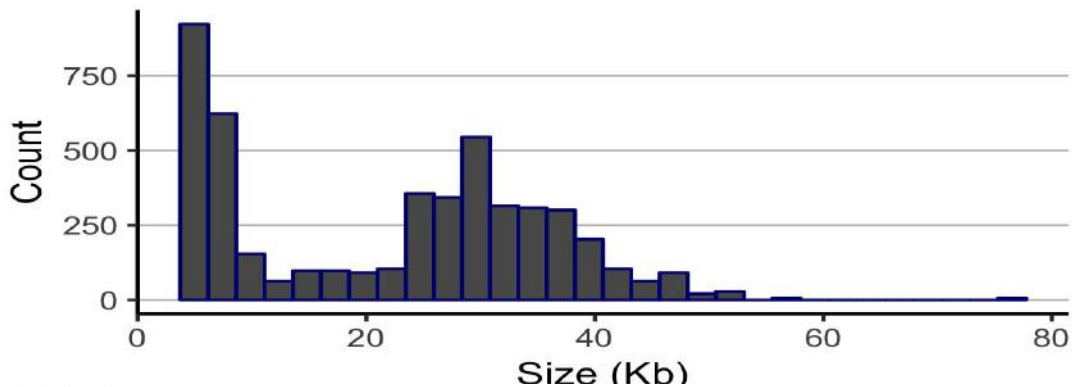




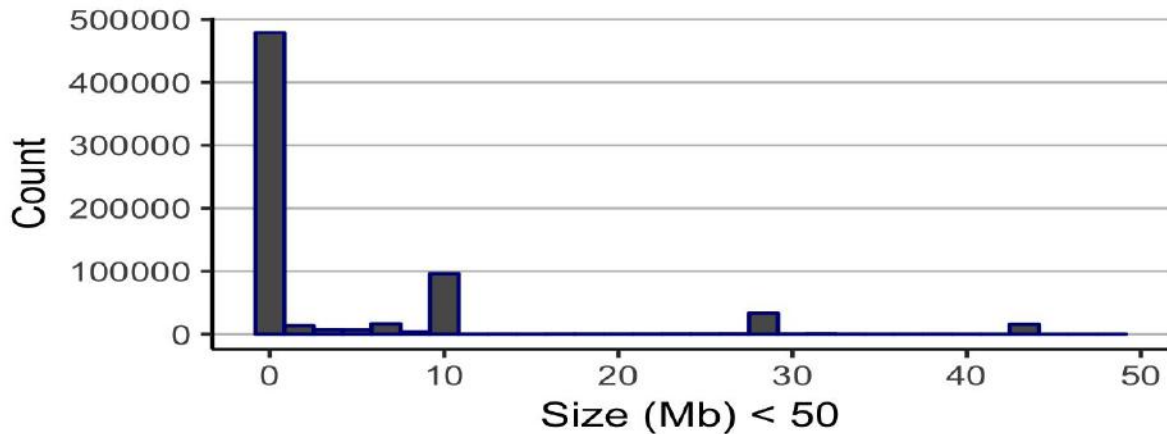
# Size distribution



## Metadata

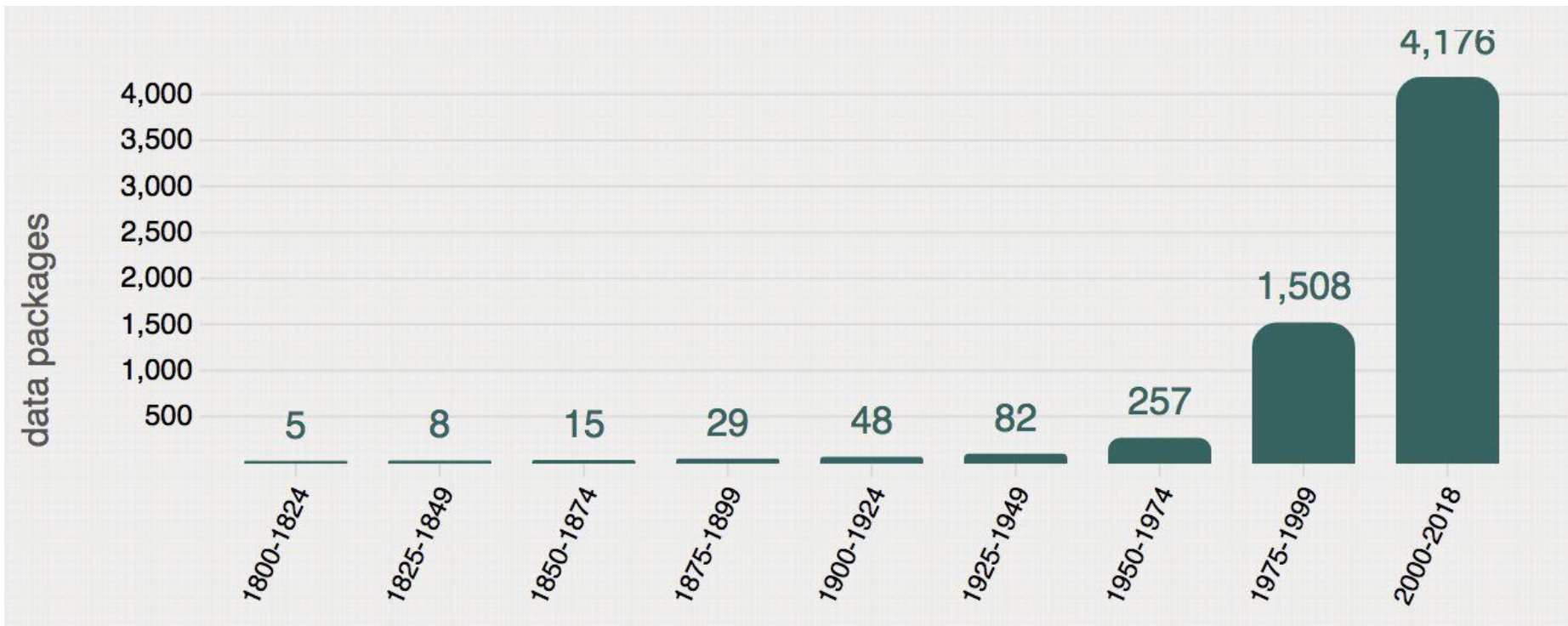


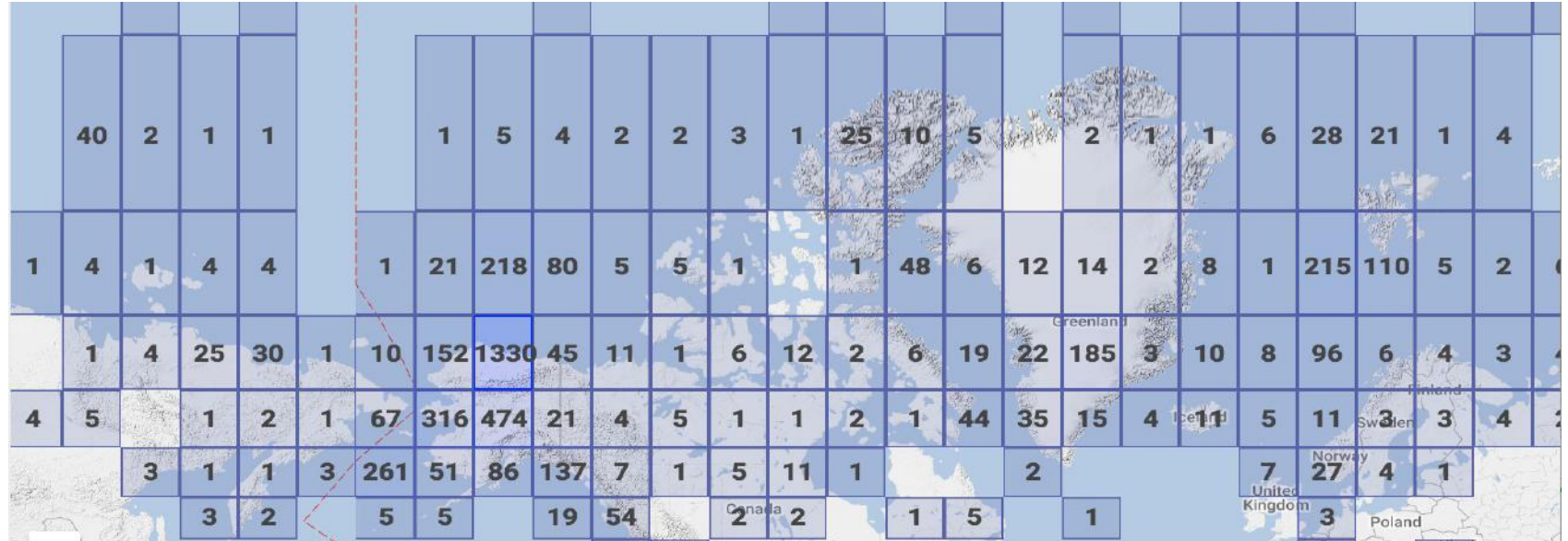
## Data (< 50MB)





# Data by time period







# Data Discovery Portal

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



[Data](#) [Support](#) [About](#) [Community](#) [Submit Data](#)

[Sign in with Orcid](#)

Search ?

Search phrase

Filter by:

☐ Data attribute

density, length, etc.

☐ Creator

☐ Year

☐ 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.

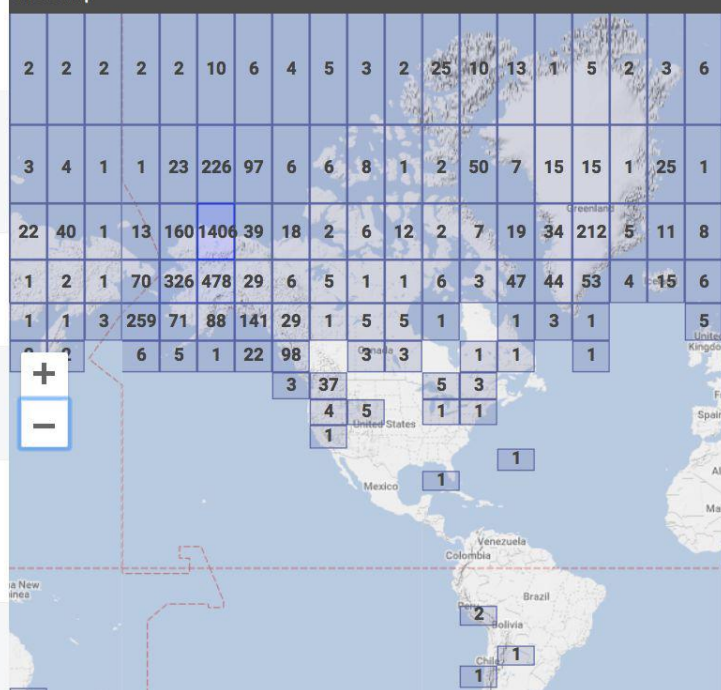
Carrie Morrill. 2018. **Code for lake energy and water balance model, Toolik Lake, Alaska, 2018.** Arctic Data Center. doi:10.18739/A2BC3SW87.

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

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1800  2018

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☐ Location

DATASETS 1 TO 25 OF 5,289

[1](#) [2](#) [3](#) ... [212](#) [Next](#)

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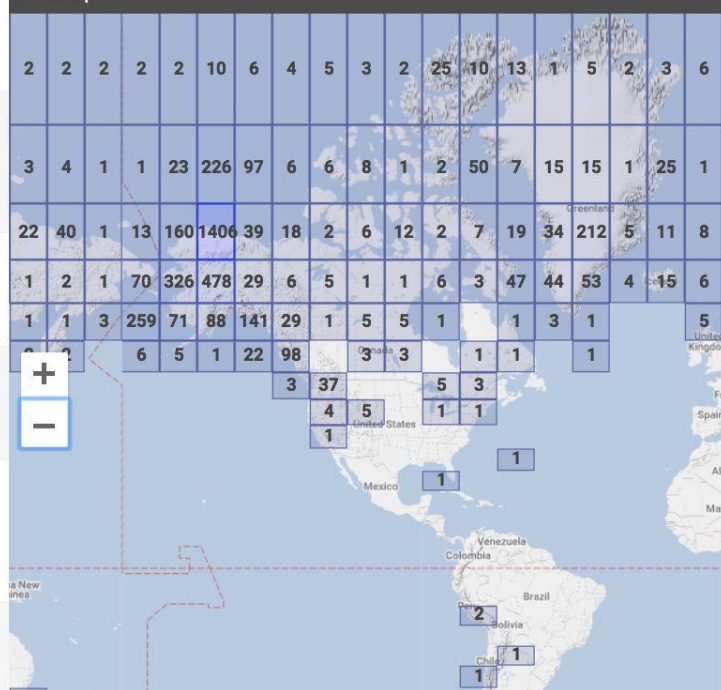
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Hide Map »





# 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	Download
	gw2014_melt_vs_depth.csv	<a href="#">More info</a>	text/csv	631 B	Download
	nu2015_melt_vs_depth_nov2017.csv	<a href="#">More info</a>	text/csv	19 KB	Download
	gc2015_density.csv	<a href="#">More info</a>	text/csv	33 KB	Download

[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. These cores were collected in support of the NICE project Collaborative Research Investigating the Influence of Sea surface





# Tools and Infrastructure



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

Citations

0



Downloads

55



Views

301

Copy Citation

Quality report

Files

Unified dataset

Add files to start your dataset

+ Add Files

Overview

Overview

Title \*

A title for this dataset. Include the topic, geographic location, dates, and if applicable, the scale of the data. Write out all abbreviations.

Example: Greater Yellowstone Rivers from 1:125,700 U.S. Forest Service Visitor Maps (1961-1983)

Dates \*

Locations \*

Taxa

Methods

Abstract \*

Provide a brief overview that summarizes the specific contents and purpose of this dataset.

2 inputs

Other Entity

Entity Name **heatmaps.R**

Download

Data Object Type: Other

Physical Structure Description:

Object Name **heatmaps.R**

Size **3439 bytes**

Authentication **c76dcddacf719f1d4501ba5ce9da1e90fbadc8c3 Calculated By SHA1**

5 outputs

## Metadata Quality Report

After running your metadata against our standard set of metadata, data, and congruency checks, we have found the following potential addressing the issues below:

26 checks

Identification: 100% complete

Discovery: 100% complete

Interpretation: 100% complete

Passed 18 checks out of 18 (informational checks not included).

Warning for 0 checks.

Failed 0 checks.

8 informational checks.



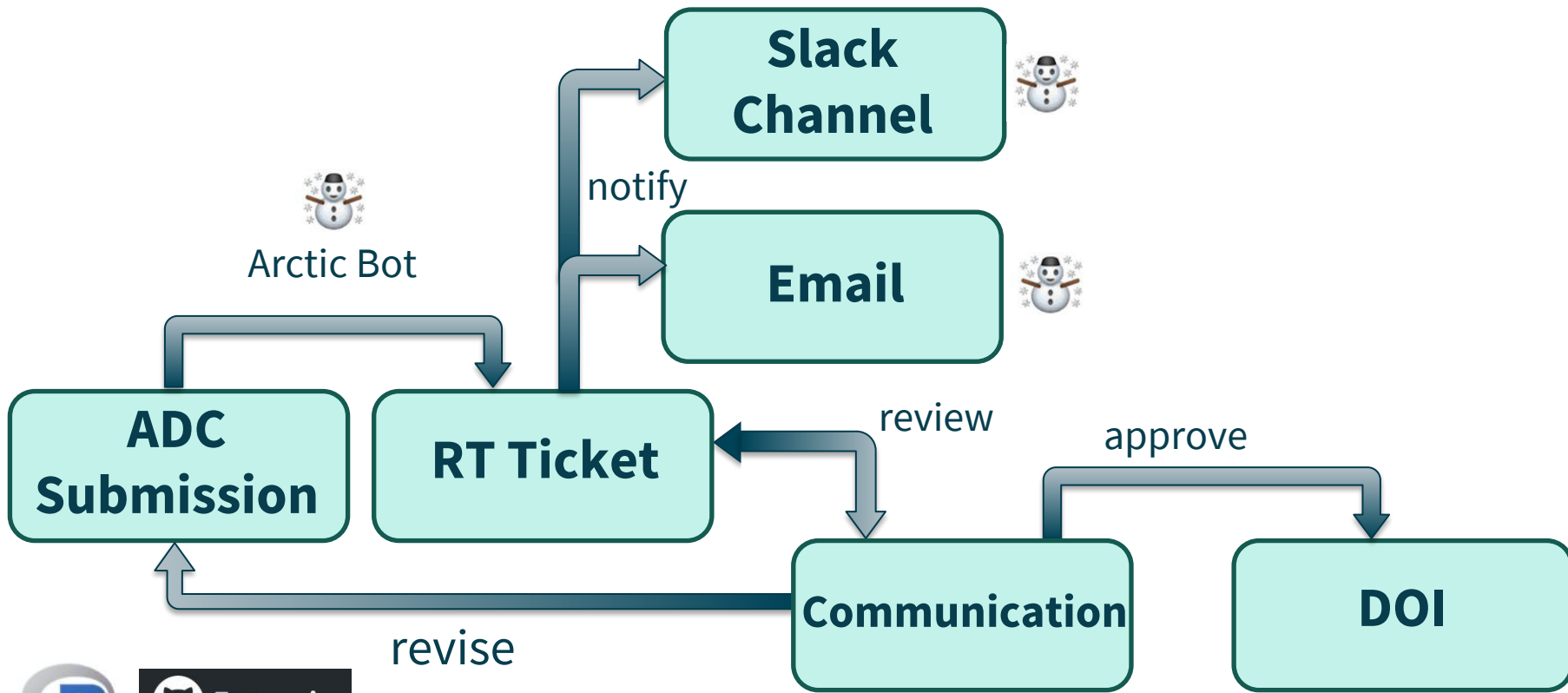


# Support Services





# Support Systems





# Request Tracker ticket system



Display History Basics People Dates Links Jumbo Reminders Actions ☆ 🔔

^ History Show all quoted text Show full headers

Mon Apr 10 18:00:22 2017

**arcticbot - Ticket created**

Reply Comment Forward

Subject: ERMOLD: IABP 12-Hourly Interpolated position, velocity, SL... (arctic-data.10529.1)

A new submission just came in. View it here: <https://arcticdata.io/catalog/#view/arctic-data.10529.1>. This ticket was automatically created by the submissions bot because the PID arctic-data.10529.1 was created/modified. See <https://github.com/ncas.ucsb.edu/KNB/arctic-data/blob/master/docs/handling-submissions.md> for more information on what to do. If you aren't sure why this ticket was created, please see the README at <https://github.com/ncas.ucsb.edu/KNB/submissions-bot/>.

Download (untitled)  
with headers  
text/plain 473B

Mon Apr 10 18:00:23 2017

**The RT System itself - Outgoing email recorded**

Show

Tue Apr 11 10:01:02 2017

**dmullen (Dominic Mullen) - Requestor <wermold@apl.washington.edu> added**

Tue Apr 11 10:05:19 2017

**dmullen (Dominic Mullen) - Correspondence added**

Reply Comment Forward

Hi Wendy,

Thank you for your submission to the NSF Arctic Data Center. Prior to your submission being finalized we would like to make a few small changes. We will spell out the abbreviations in the title for added clarity. Additionally, I noticed there is one dataset corresponding to each year, we will aggregate these into one table for added convenience. We noticed this entry is related to a previously submitted data set (located here: <https://arcticdata.io/catalog/#view/um:uid:345e2aad-3114-4cc7-917f-22efc2ae2898>), we can nest these together after the submission is finalized.

Finally, what are the definitions (including units) of the columns?

Best,  
Dominic Mullen

Download (untitled)  
with headers  
text/plain 871B

Tue Apr 11 10:05:20 2017

**The RT System itself - Outgoing email recorded**

Show

Tue Apr 11 10:05:20 2017

**The RT System itself - Outgoing email recorded**

Show

Tue Apr 11 12:19:50 2017

**<wermold@apl.washington.edu> - Correspondence added**

Reply Comment Forward

From: "Wendy Ermold" <wermold@apl.washington.edu>  
Date: Tue, 11 Apr 2017 12:12:29 -0700  
Subject: Re: [arcticdata #14635] ERMOLD: IABP 12-Hourly Interpolated position, velocity, SL... (arctic-data.10529.1)  
CC: "Ignatius Rigor" <ignatius@uw.edu>  
To: support@arcticdata.io

Hi Dominic,

Thank you for nesting this dataset with the others of its kind! The changes you suggest sound good.

The data in all 4 submitted files for 2013 thru 2016 contain the following columns of data:

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with headers  
text/plain 1.7K



# Request Tracker ticket system



Display History Basics People Dates Links Jumbo Reminders Actions ☆ 🔔

^ History Show all quoted text Show full headers

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with headers  
text/plain 1.7K



# Slack #arcticbot



**Arctic Bot** APP 5:40 AM

Correspondence by [jcohen@aer.com](mailto:jcohen@aer.com) on [Ticket 18007](#):

Thank you for the update on downloading Dave's data My final report for the related project will not be approved until I have included a link to the data I have several pending proposals being review...



**Arctic Bot** APP 6:25 AM

Correspondence by [kevin.r.wood@noaa.gov](mailto:kevin.r.wood@noaa.gov) on [Ticket 18054](#):

Any news on the link to the data set Thanks Kevin On Fri Dec 28 2018 at 8:00 PM Dominic Mullen via RT [support@arcticdata.io](mailto:support@arcticdata.io) wrote Hi Kevin Yes we are However the link isn't ready yet it should be wi...



**1 reply** Today at 9:04 AM





# Support Team (support@arcticdata.io)



Clark



Goldstein



Mullen



Chong



Monper



Pruett

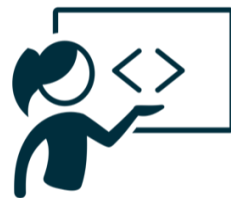


Sun

Student Interns

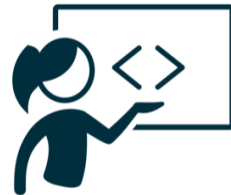


# Training and Outreach





# Training and Outreach

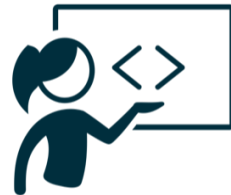


- Training
  - Trainings
  - Workshops
  - Internship Program
  - Data Fellows Program
  - Webinars





# Training and Outreach



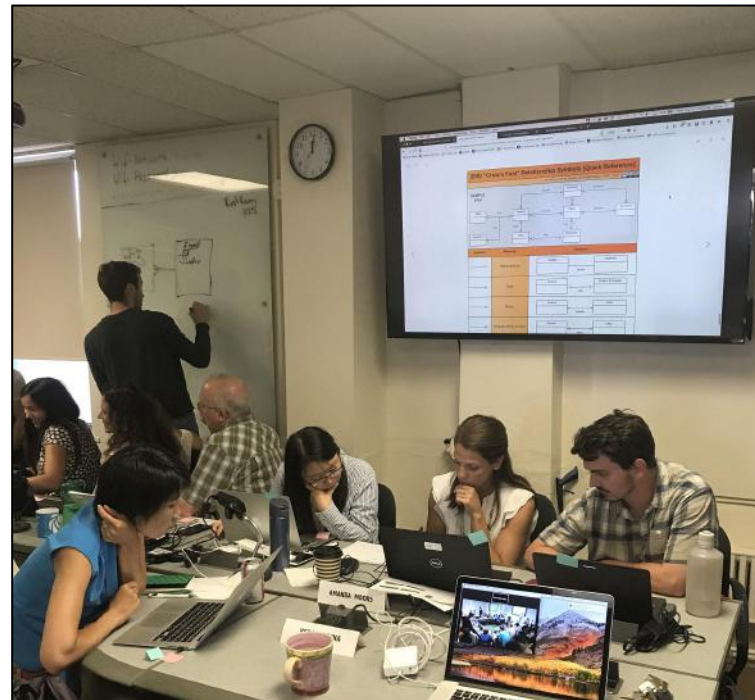
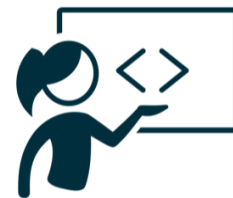
- Outreach
  - In-person events
  - News items and other communications
  - Social media
  - Arctic Data Center website







# Arctic Data Science Training





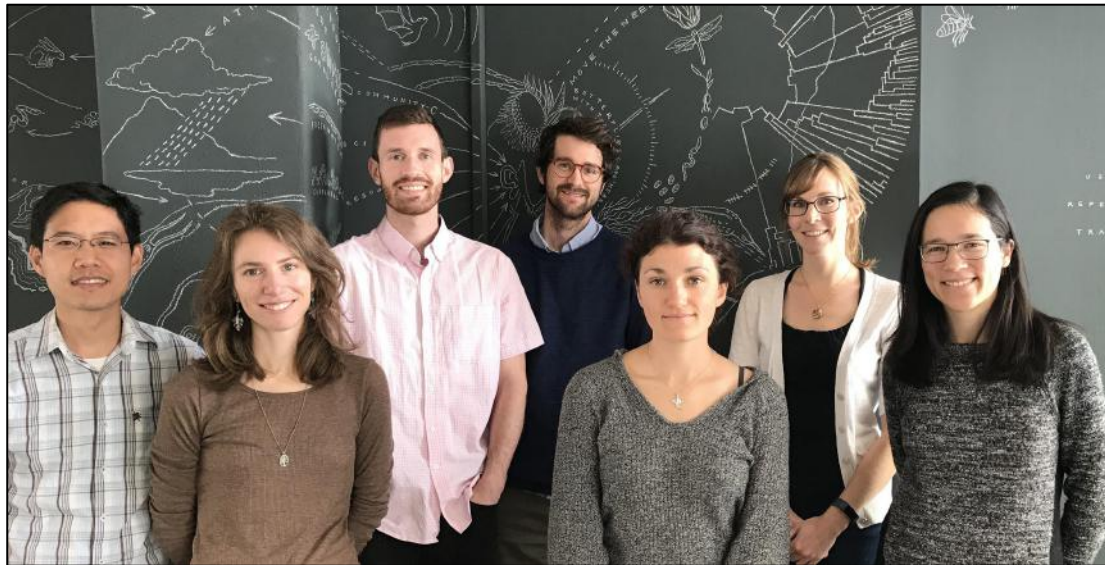
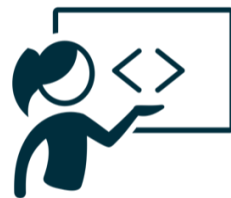
# Data Training & Outreach








# Data Science Fellowship







[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](#)



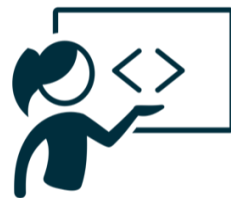
**Emily O'Dean Reenergized Her Passion for Mixing Software and Science**  
"Working at NCEAS has made me really excited about utilizing my computer science knowledge in the context of ecological research."  
[More](#)



**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](#)



# 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.

**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 Lefler, know this well.



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

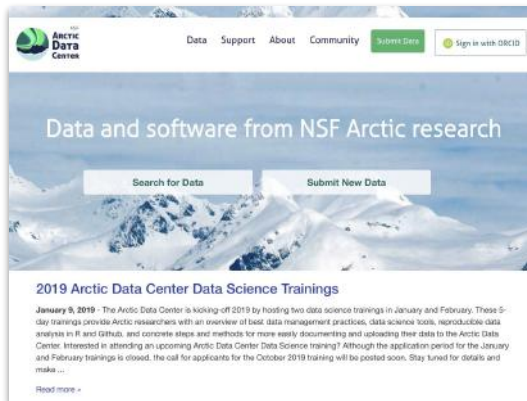
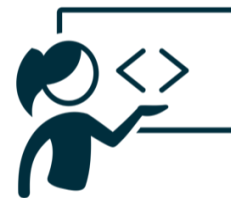


But while phenological mismatch is known to have effects on herbivore populations, Kelsey and her team are specifically investigating how these timing changes affect interactions between the biosphere and the atmosphere. To do this, they collected data on the exchange of greenhouse gases, including carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>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



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







# Data Rescue

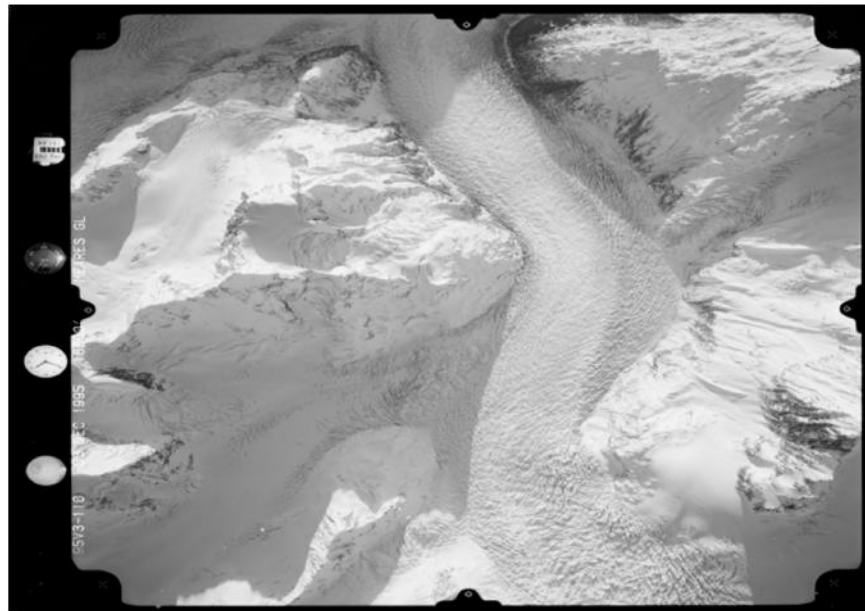




# Data Recovery: Aerial Glacier Photos



- 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."*



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*"...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."*



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*“...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:node: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 interface. At the top left is the logo with the text "NSF Arctic Data Center". To the right are navigation links: "Data", "Support", "About", a green "Submit Data" button, and a "Sign in with Orcid" button. Below the navigation bar is a yellow warning banner that reads: "⚠ NOTE: A newer version of this dataset exists". Underneath the banner is a breadcrumb trail: "Home / Search / Metadata". The main content area displays the following text: "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-a584-9d1aafacca63." In the bottom right corner of the content area, there is a small circular icon with a plus sign.



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



# Operation Metrics



**5,000+**  
DATA SETS



**2,000+**  
CREATORS



**10K+**  
DOWNLOADS/MO



**6,000+**  
USERS



# Arctic Data Center Features and Services



Data Archive



Data Discovery Portal



Tools and Infrastructure



Support Services



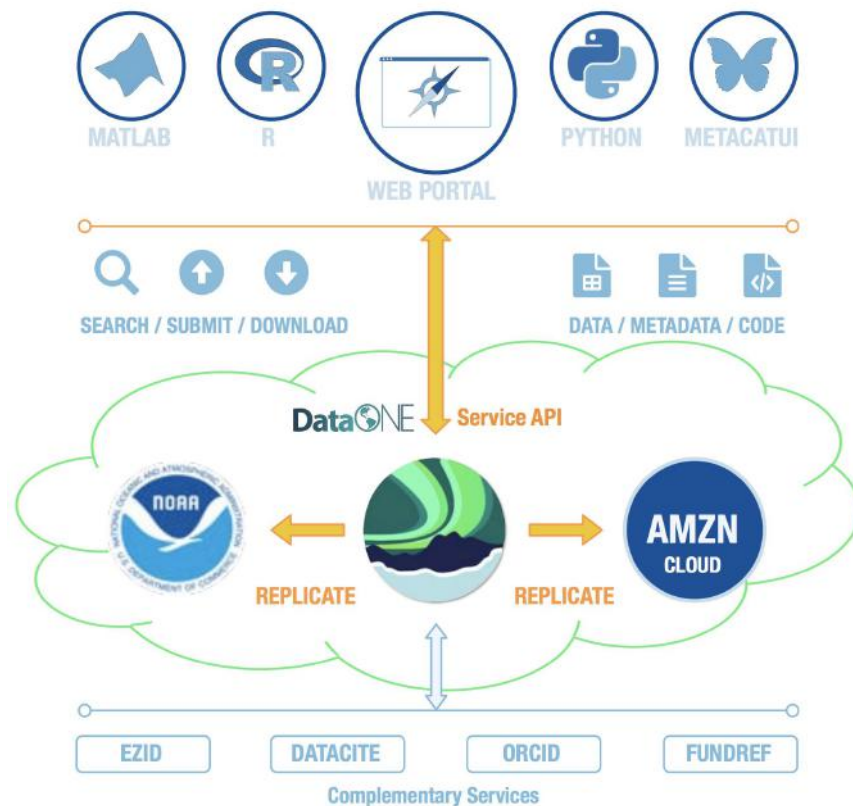
Training and Outreach



Data Rescue



- Projects: GRISO, DBO, ARMAP
- Repositories: LTER, BCO-DMO, R2R, Antarctic Data Center (IDEA)
- Networks: A2DC, Arctic Data Explorer
- Committees: Arctic Data Committee, IARPC Data Sub-team, POLDAR, MOSAiC Data Team







<https://arcticdata.io>