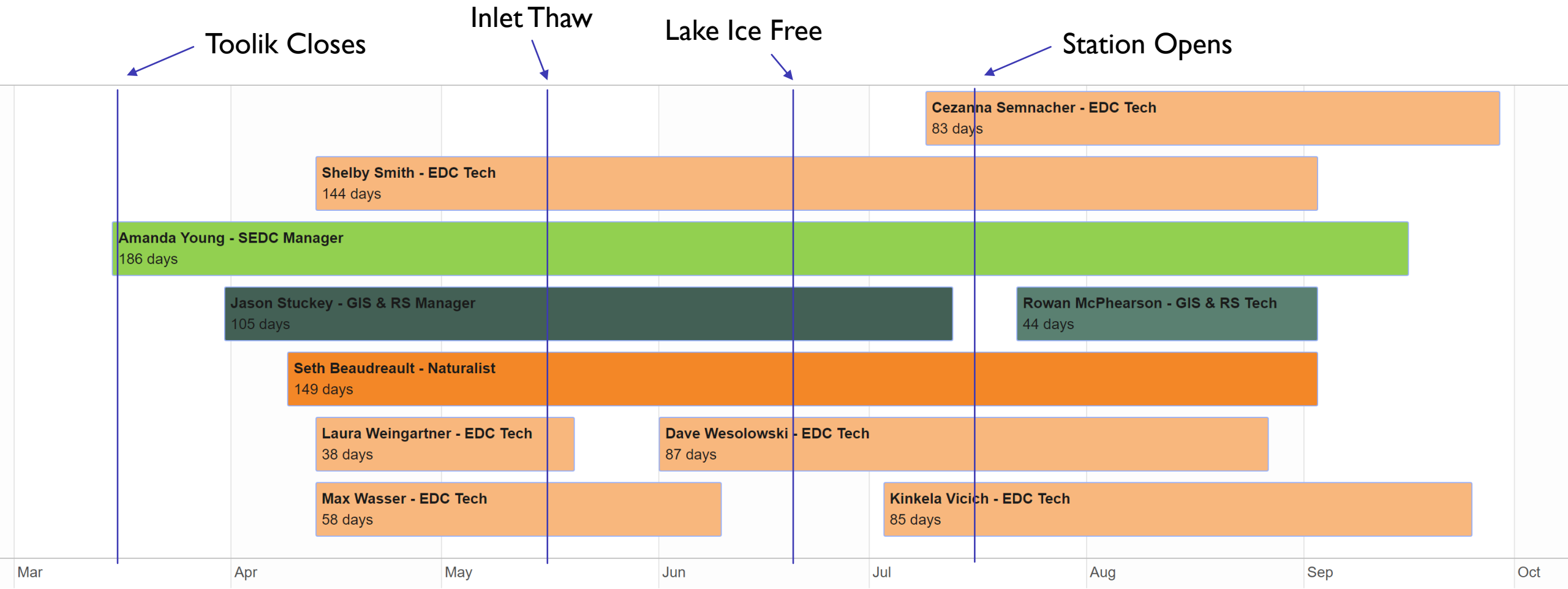
SEDC REPORT

OCT 1, 2019 - SEPT 30, 2020 REPORT
2020 SPATIAL AND ENVIRONMENTAL DATA CENTER REPORT

AMANDA B. YOUNG

2020 STAFFING AT TOOLIK



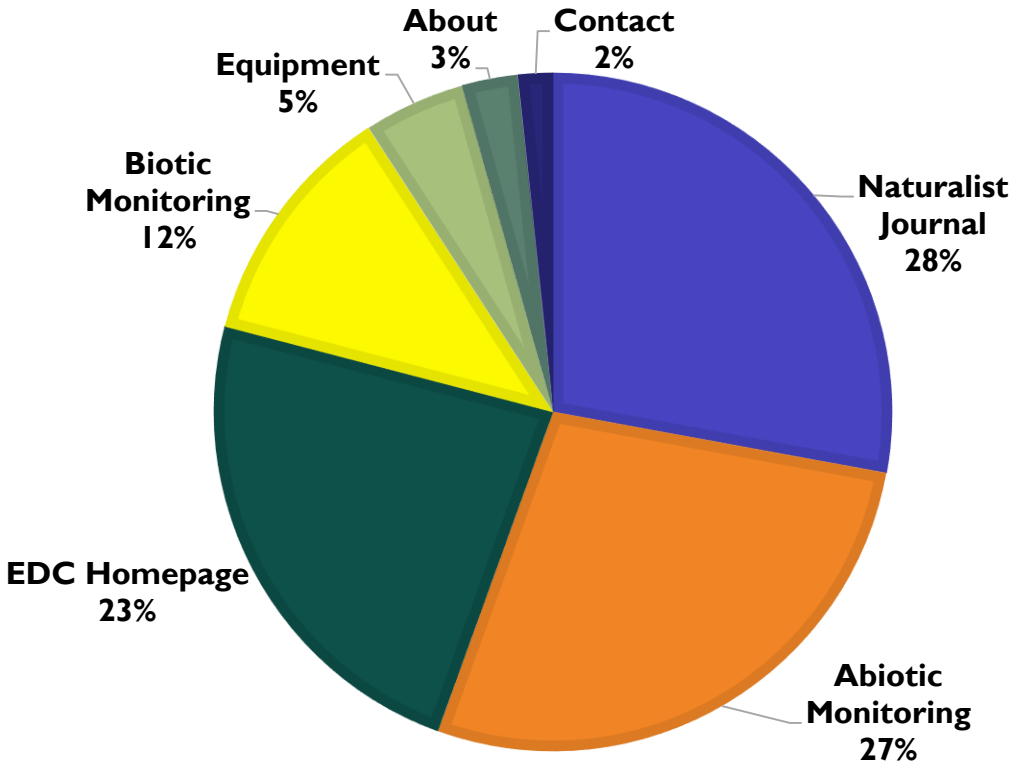
EDC MISSION STATEMENT

- Collect and manage baseline environmental data
- Maintain suite of common-use lab and field equipment
- Fieldwork assistance & Remote Access

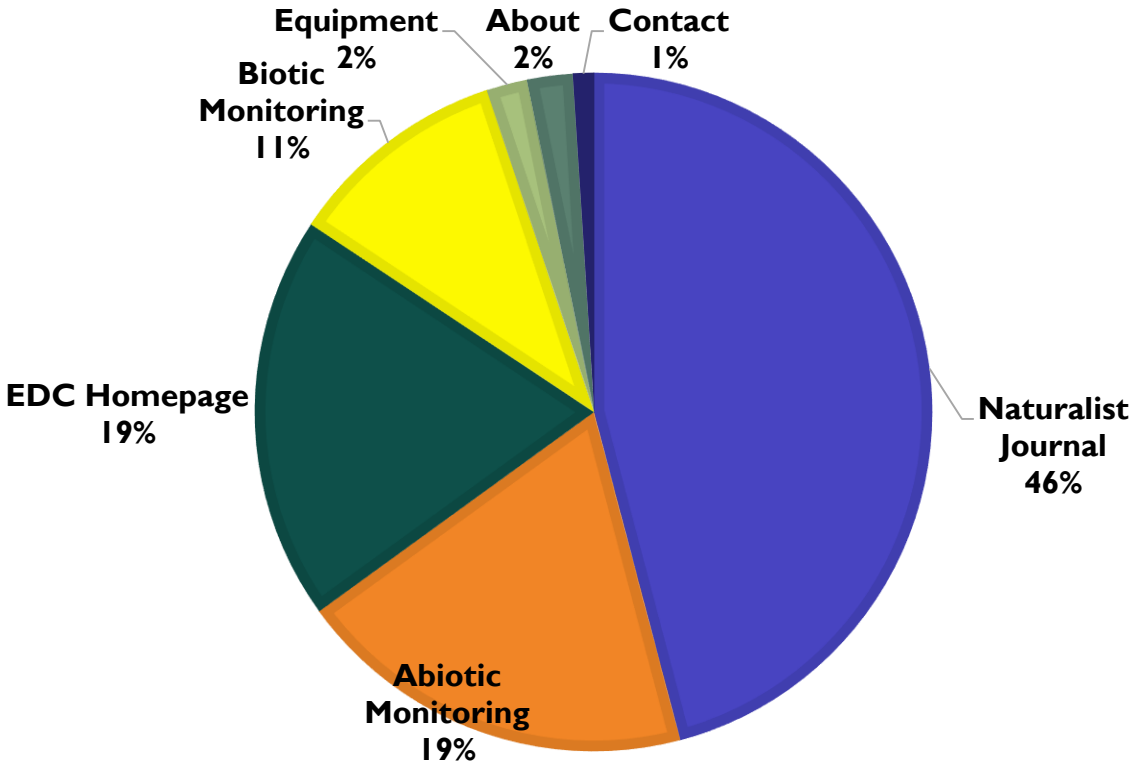
- Outreach
  - Make EDC data available to the public
  - Create guides to help in identification

PAGEVIEWS (OCT 1-SEPT 30)

2019 – 26,817 pageviews

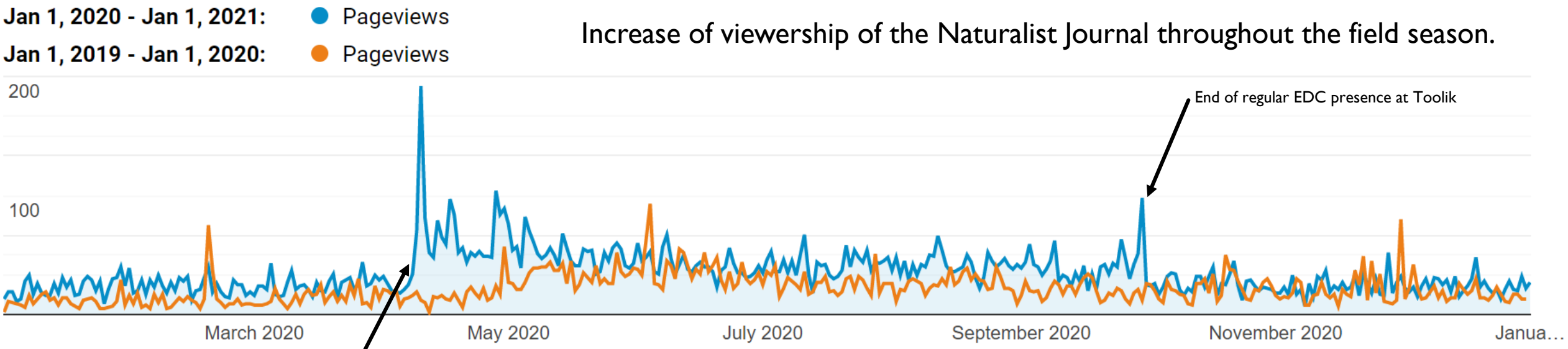


2020 – 28,668 pageviews



NATURALIST JOURNAL - VIEWERSHIP

Increase of viewership of the Naturalist Journal throughout the field season.



DATA USAGE

- EDC Webpage
  - Met station data requests 290 by 72
  - Phenology data requests 14 by 8
  - Bird Point count requests 2 by 2
  - NDVI requests 8 by 6
- Direct Request
  - Met station data 3 by 3
- Arctic Data Center (data has DOI)
  - Phenology 79 118
  - Bird Point Counts 268 116
  - Met Station data 104 237

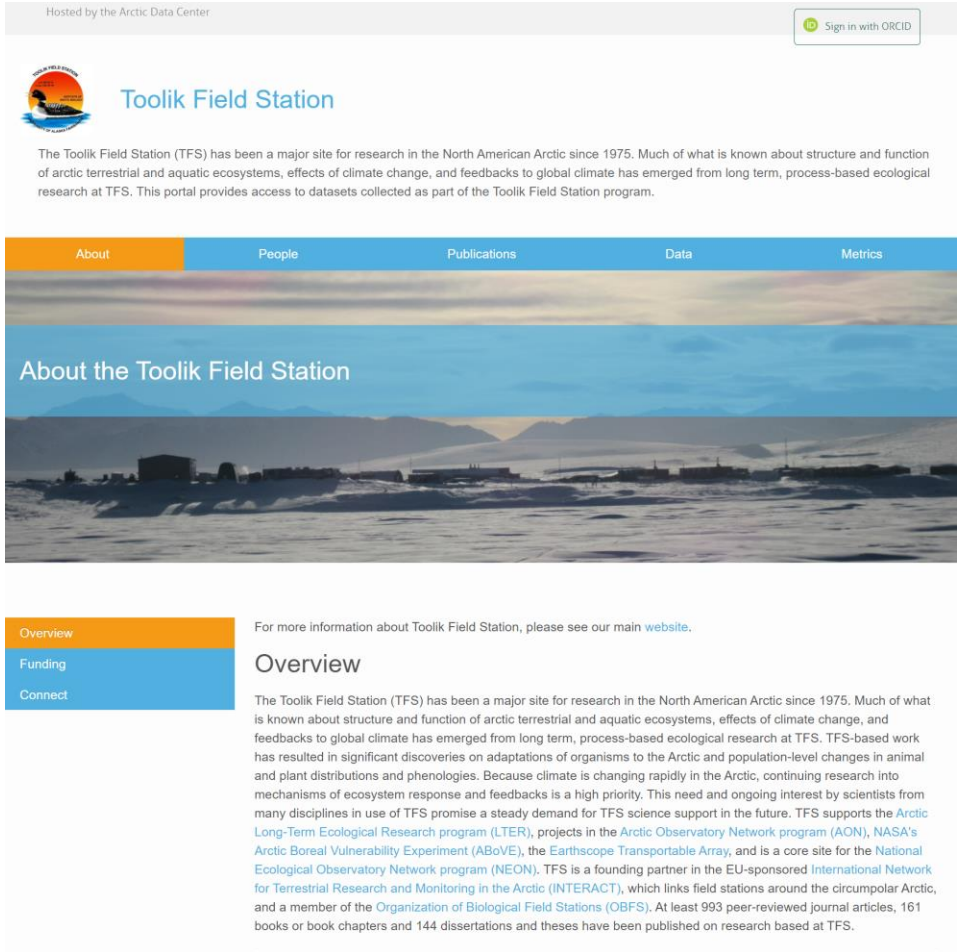
NSF Arctic Data Center

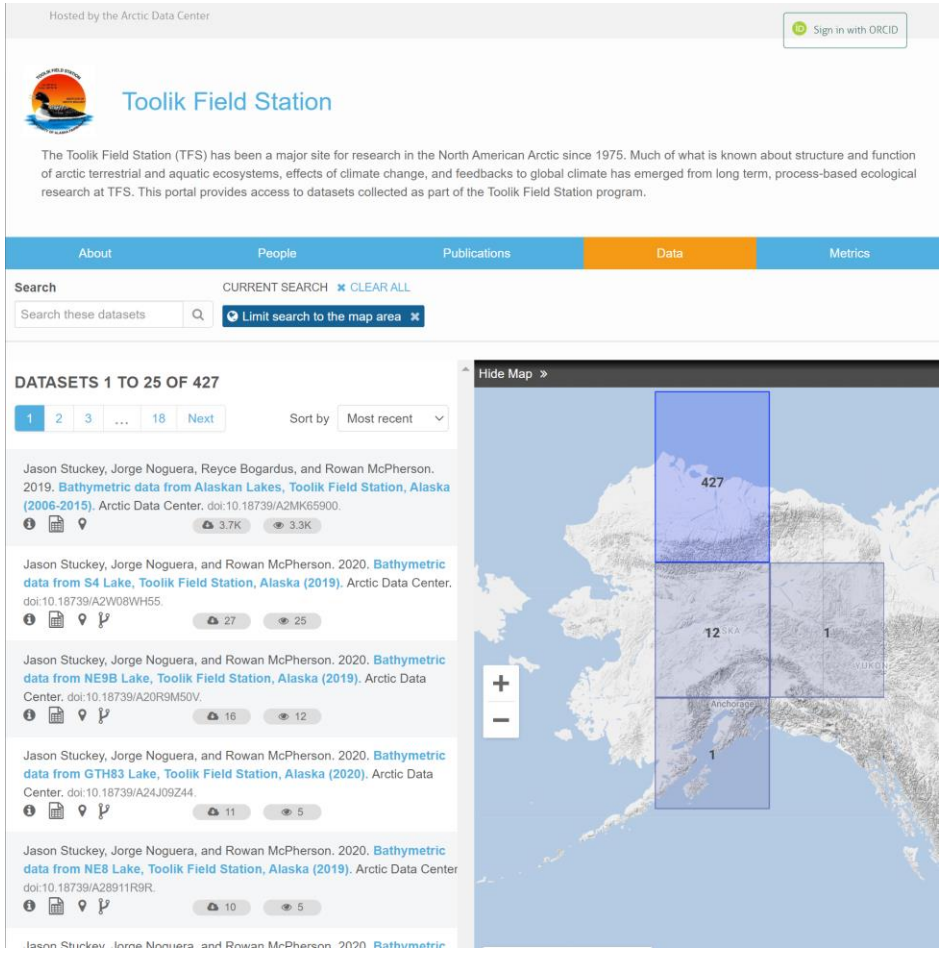
Downloads
People
Views

- Naturalist Journal – Birds 215 62
- Naturalist Journal – Mammals 332 53
- Naturalist Journal – Insects 261 62

ARCTIC DATA CENTER PORTAL

https://arcticdata.io/catalog/portals/toolik

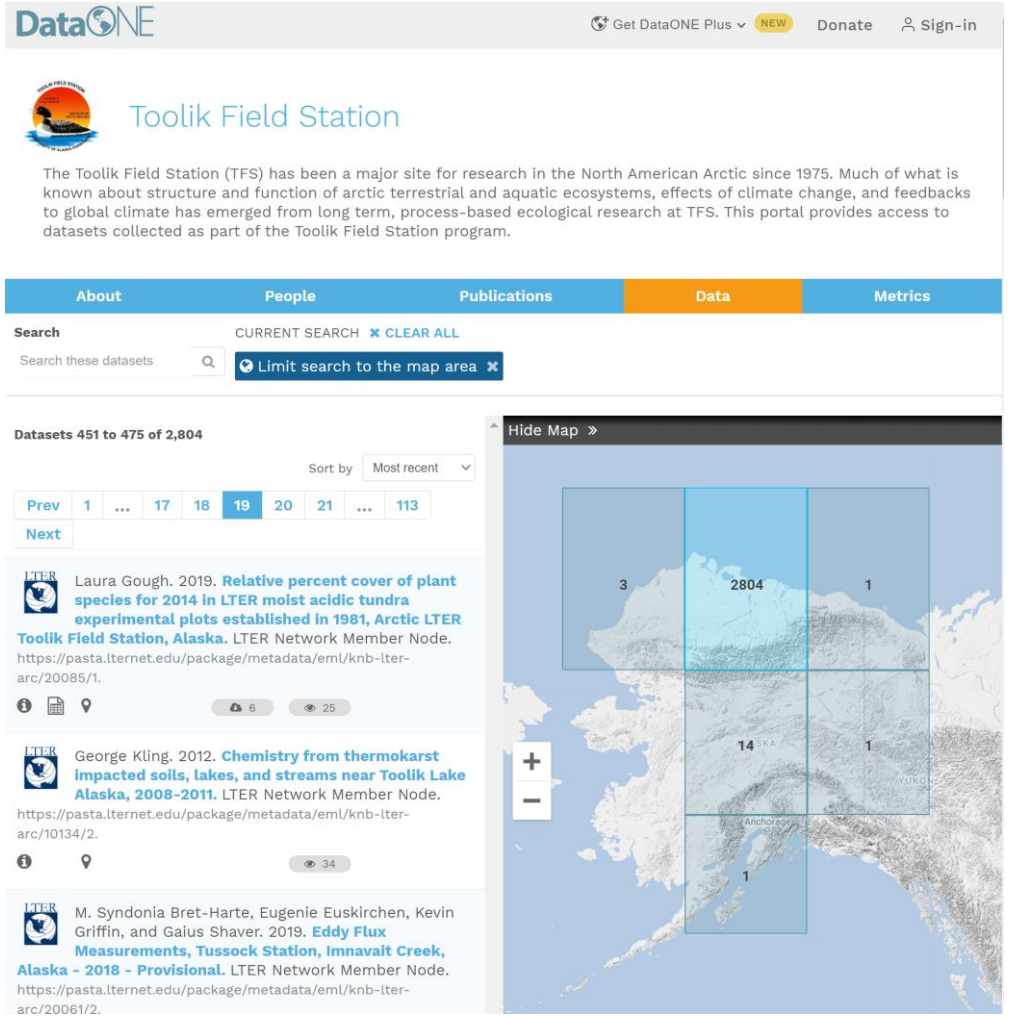




DATAONE TOOLIK PORTAL

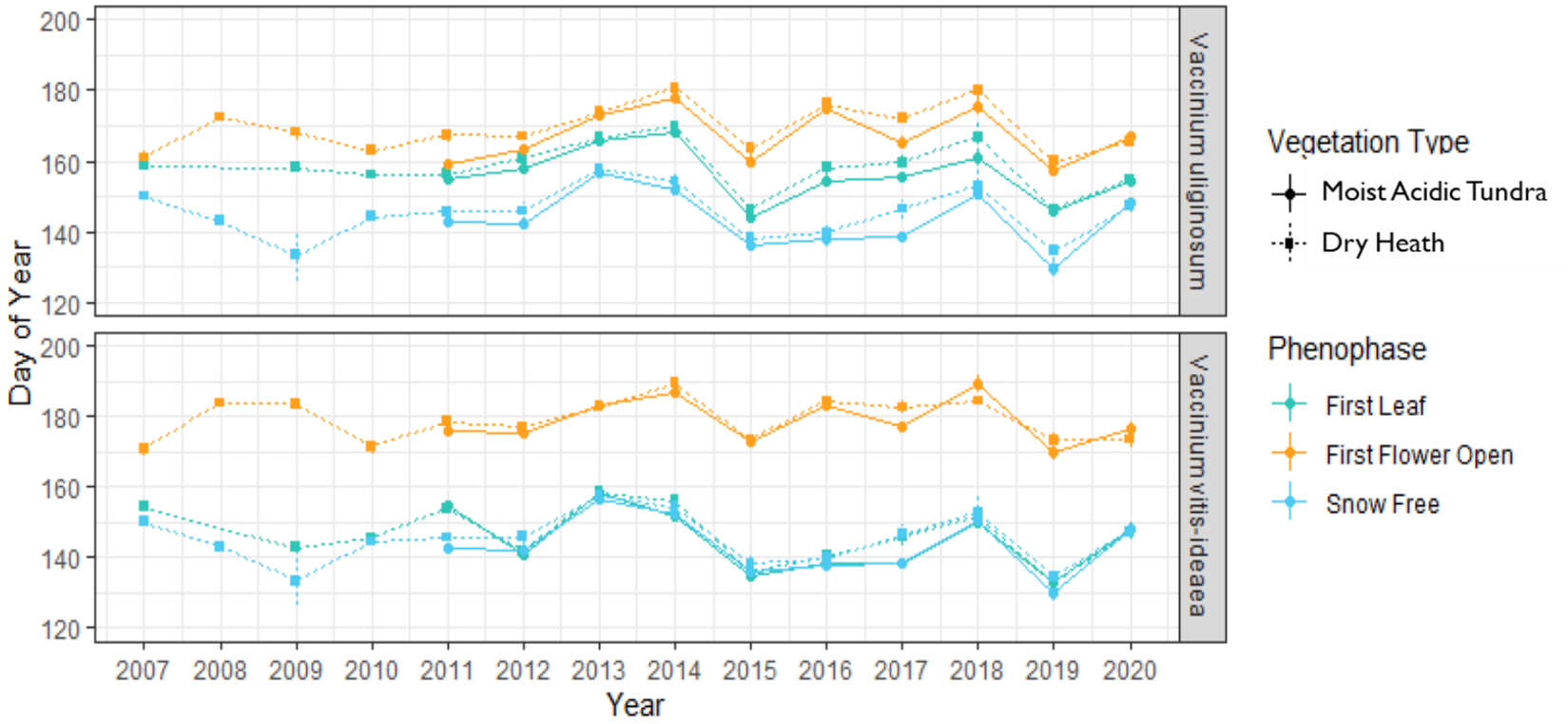
https://search.dataone.org/portals/toolik/

- Working with DataONE programmers we duplicated the Arctic Data Center (ADC) portal to encompass all of DataONE repositories
  - ADC, EDI, NEON, USGS, LTER, etc.
  - Datasets in the portal grew from 427 datasets in the ADC portal to 2,804 datasets!
- Working with the ADC and DataONE programmers to add filters to the datasets based on location and study system.
- If these portals are used and appreciated by the community we will keep them up.

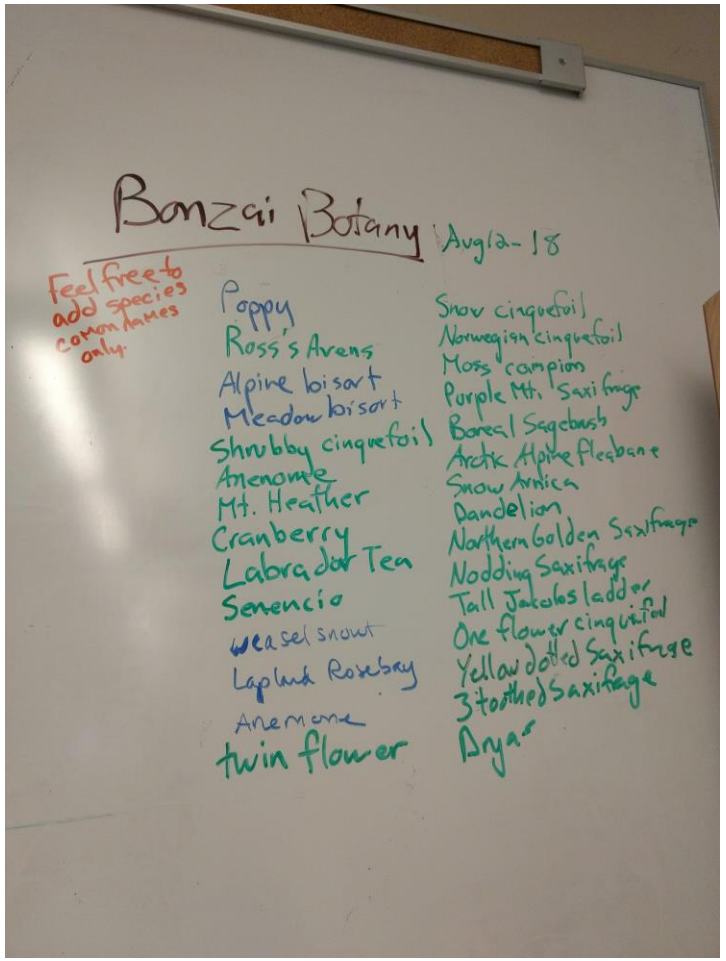


BASELINE MONITORING
BIOLOGICAL MONITORING – PHENOLOGY

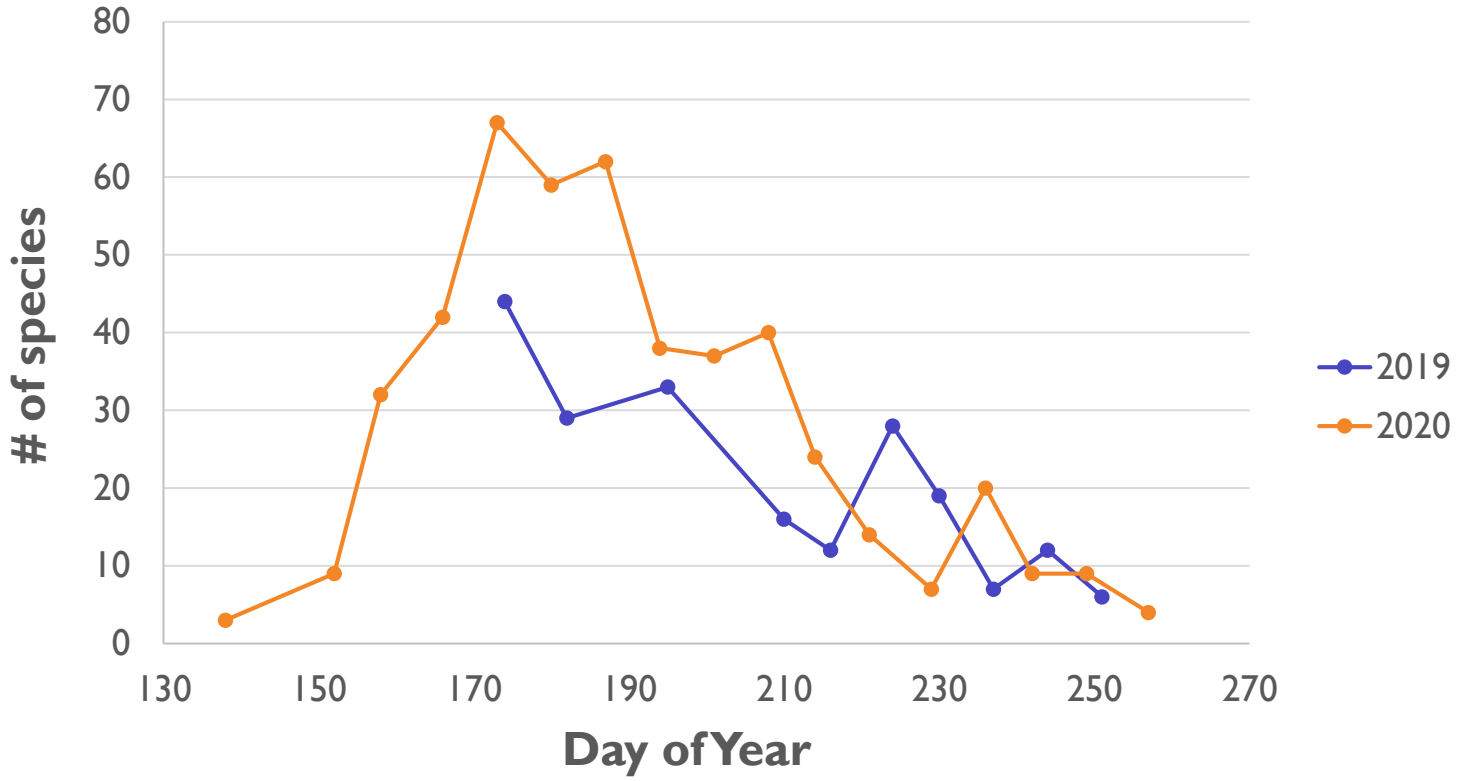
- Vegetation Phenology
  - NDVI



BONZAI BOTANY

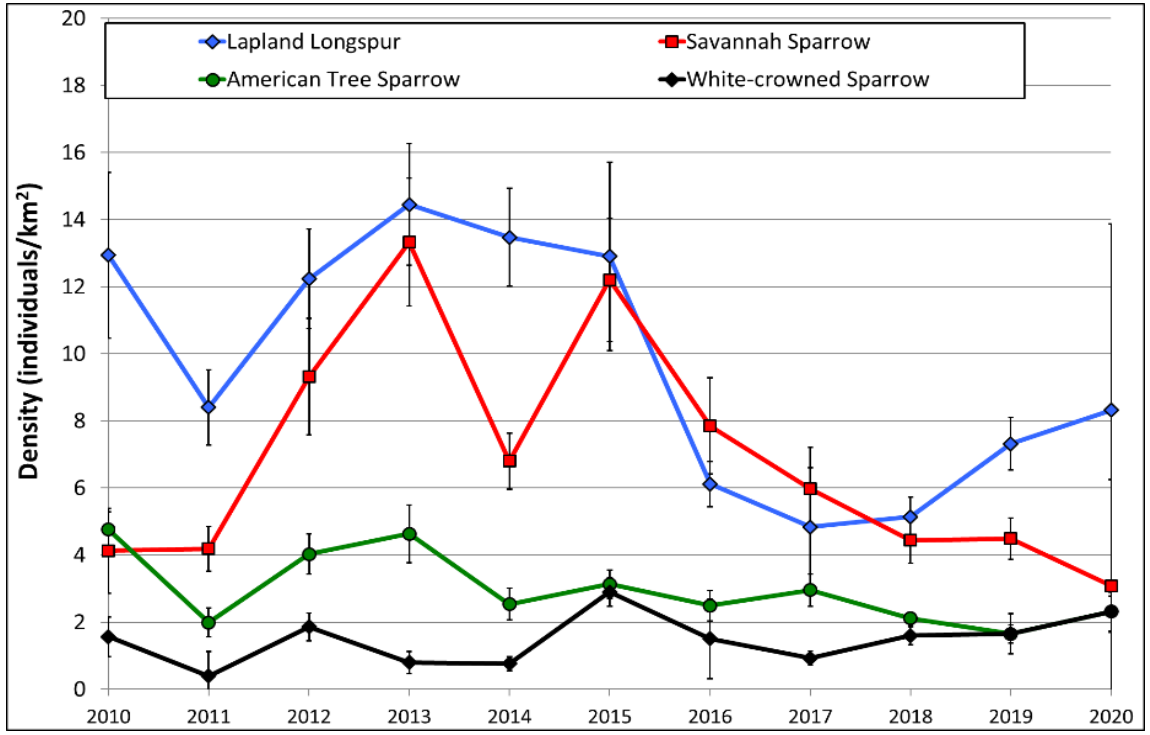


- Plants in flower during a given week are recorded
- Common names only so all can participate

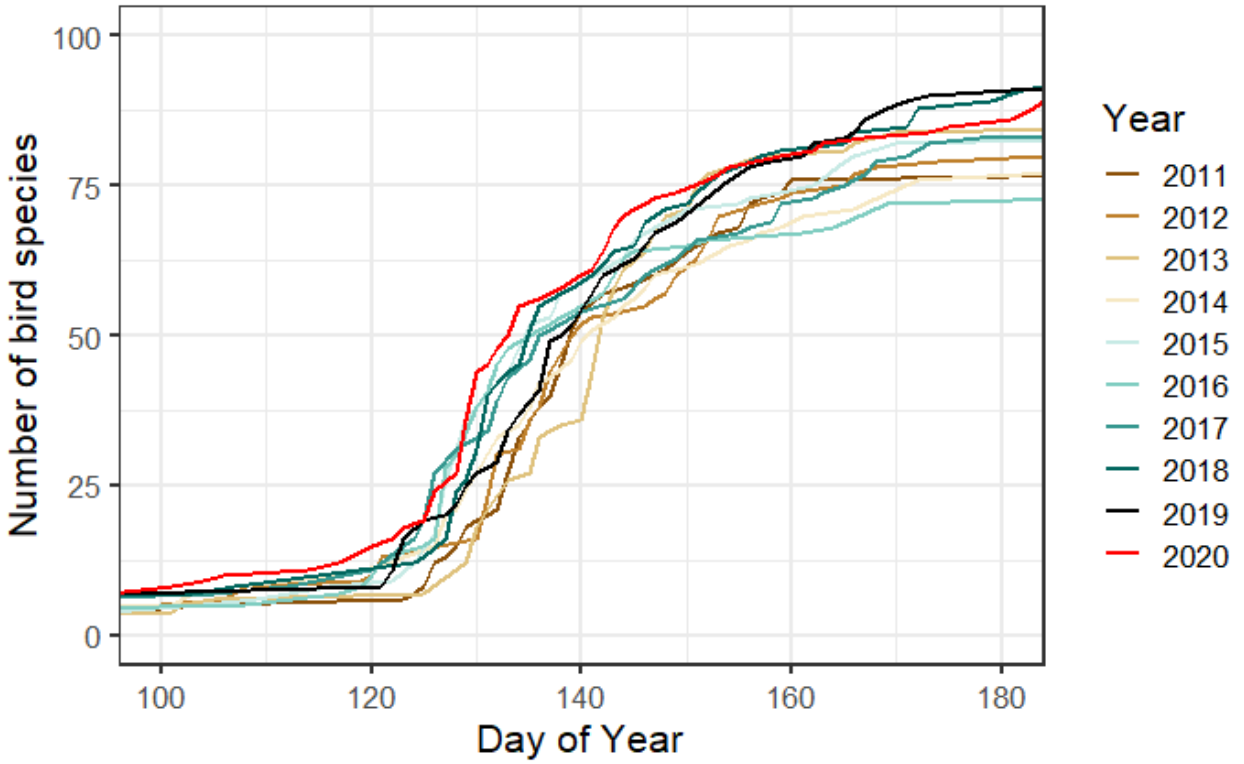


BASELINE MONITORING
BIOLOGICAL MONITORING - AVIAN

- Avian point counts



- Date of Arrival of bird species from the naturalist journal



BASELINE MONITORING
BIOLOGICAL MONITORING – AUDIO RECORDINGS OF BIRDS

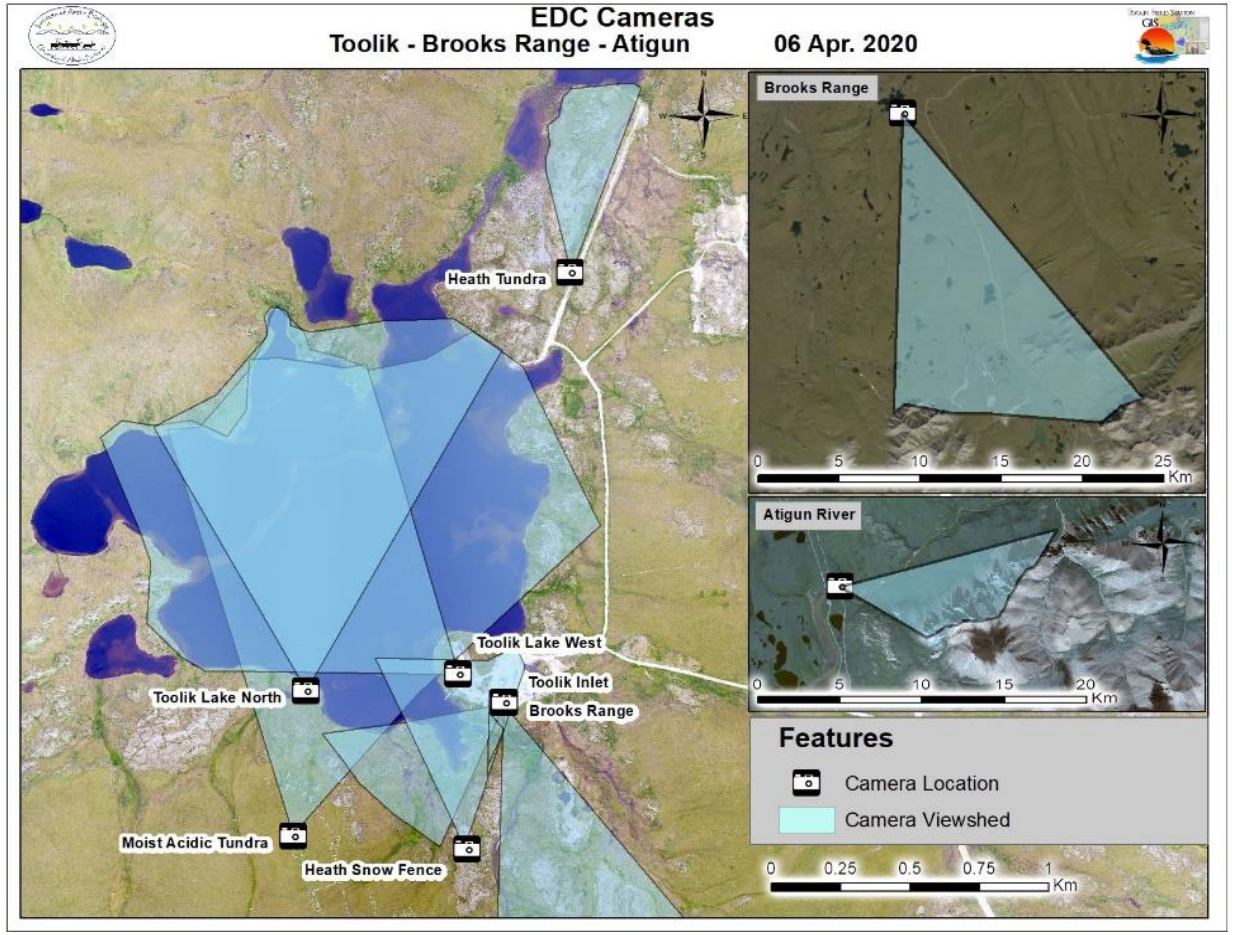
- Audio recording of bird species from the Toolik area.
  - Calls are being added to the Bird Guide

Male Lapland Longspur Call in May 2020
https://www.xeno-canto.org/589929

Bluethroat Call in May 2020
https://www.xeno-canto.org/590296

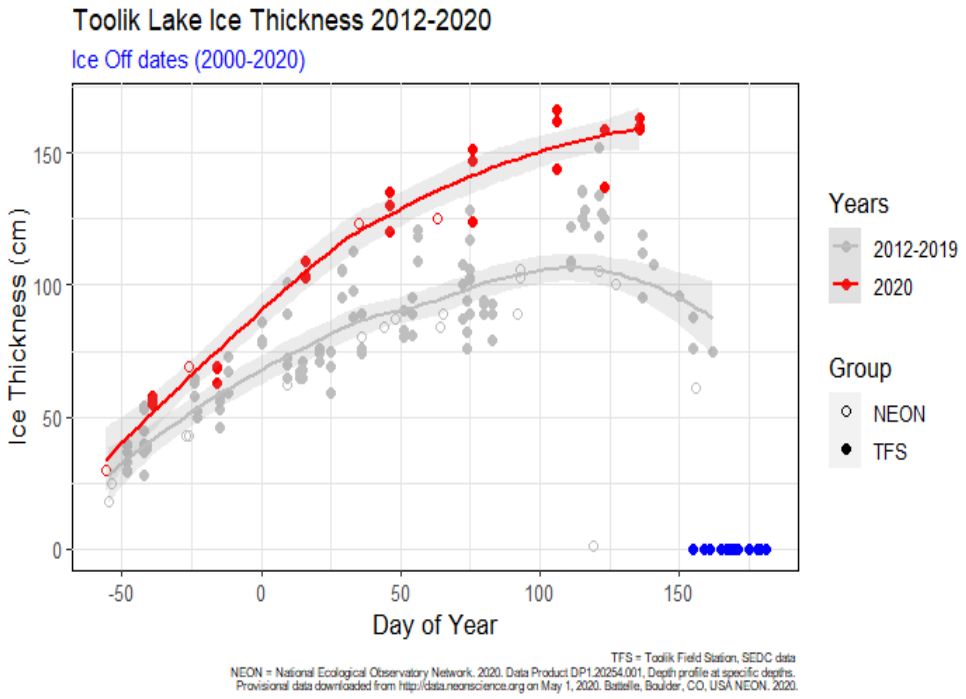
BASELINE MONITORING
ABIOTIC MONITORING - TIME LAPSE IMAGERY

- Cameras up-to-date online
- Two webcams
  - Daily update to website
- Five Buckeye cams
  - Upgrading cameras
    - Redeploy week of Jan 14th
    - Daily update to website
  - Future cameras?

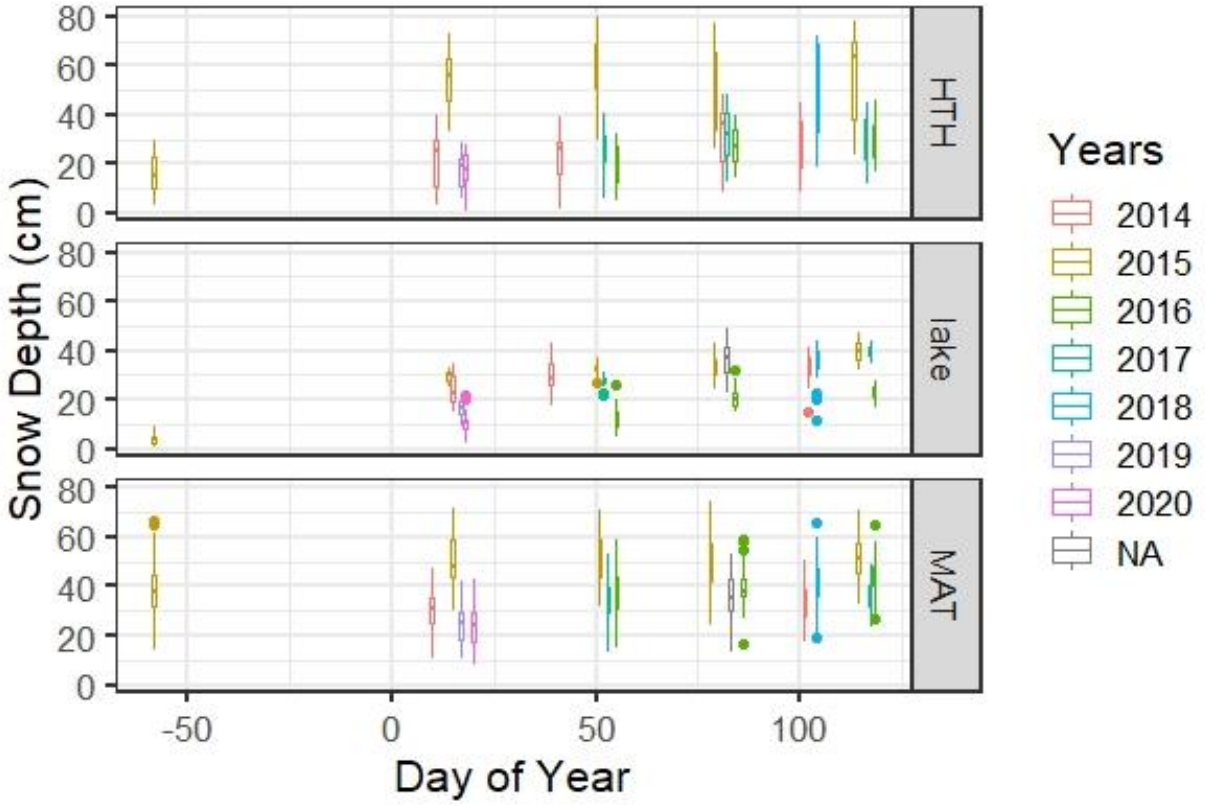


BASELINE MONITORING
ABIOTIC MONITORING – SNOW AND ICE

- Ice Thickness Measurements



- Snow Depth Measurements



BASELINE MONITORING
ATMOSPHERIC MONITORING

- Monitoring
  - Ozone Monitoring – 2009 to Present
  - National Atmospheric Deposition program (NADP) – 2017 to Present
    - National Trends Network
    - Mercury Deposition Network
    - Ammonia Monitoring Network
  - Inter-agency Monitoring of Protected Visual Environments (IMPROVE) – 2018 to Present
    - Funded by the BLM
  - Purple Air – June 2019 to Present
    - Particulate matter sampling
  - Mercury Passive Air Sampler – January 2020

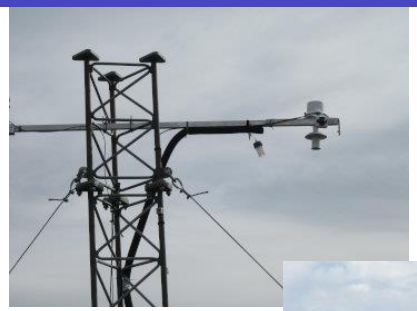


Photo by Sarah King

EXAMPLES OF DATA AND EQUIPMENT USAGE IN PUBLICATIONS

Meteorological

Fieldwork

ARCTIC, ANTARCTIC, AND ALPINE RESEARCH
2020, VOL. 52, NO. 1, 109–119
https://doi.org/10.1080/15230430.2020.1733891

Taylor & Francis
Taylor & Francis Group

OPEN ACCESS Check for updates

AAAR

Above- and belowground responses to long-term herbivore exclusion

Austin Roy [a], Matthew Suchocki [b], Laura Gough [b], and Jennie R. McLaren [a]

Biogeosciences, 17, 4025–4042, 2020
https://doi.org/10.5194/bg-17-4025-2020

Biogeosciences Open Access EGU

Environmental controls on ecosystem-scale cold-season methane and carbon dioxide fluxes in an Arctic tundra ecosystem

Dean Howard[1,2], Yannick Agnan[3], Detlev Helmig[1], Yu Yang[4], and Daniel Obrist[2]

Contents lists available at ScienceDirect

Quaternary Science Reviews

journal homepage: www.elsevier.com/locate/quascirev

ELSEVIER

Insolation and greenhouse gases drove Holocene winter and spring warming in Arctic Alaska

William M. Longo [a, b, *, 1], Yongsong Huang [a, b], James M. Russell [a, b], Carrie Morrill [c, d], William C. Daniels [a, b], Anne E. Giblin [e], Josue Crowther [a]

LIMNOLOGY AND OCEANOGRAPHY

ASLO Association for the Sciences of Limnology and Oceanography

Article | Open Access

Mixing processes in small arctic lakes during spring

Alicia Cortés, Sally MacIntyre

Autumn migratory departure is influenced by reproductive timing and weather in an Arctic passerine

Helen E. Chmura, Jesse S. Krause, Jonathan H. Pérez, Marilyn Ramenofsky & John C. Wingfield

Journal of Ornithology **161**, 779–791(2020) | Cite this article

https://doi.org/10.5194/bg-2020-235
Preprint. Discussion started: 17 July 2020

Biogeosciences Discussions Open Access EGU

Biogenic volatile organic compound ambient mixing ratios and emission rates in the Alaskan Arctic tundra

Hélène Angot[1], Katelyn McErlean[1], Lu Hu[2], Dylan B. Millet[3], Jacques Hueber[1], Kaixin Cui[1], Jacob Moss[1], Catherine Wielgasz[2], Tyler Milligan[1], Damien Ketcherside[2], Marion Syndonia Bret-Harte[4], Detlev Helmig[1]

FIELD WORK ASSISTANCE

- 2017: 170 hours of assistance to 14 projects for 14 different researchers.
- 2018: 179 hours of assistance to 15 projects for 14 different researchers.
- 2019: 242 hours of assistance to 18 projects for 29 different researchers.
- **2020: 2344 hours of assistance to 27 projects**

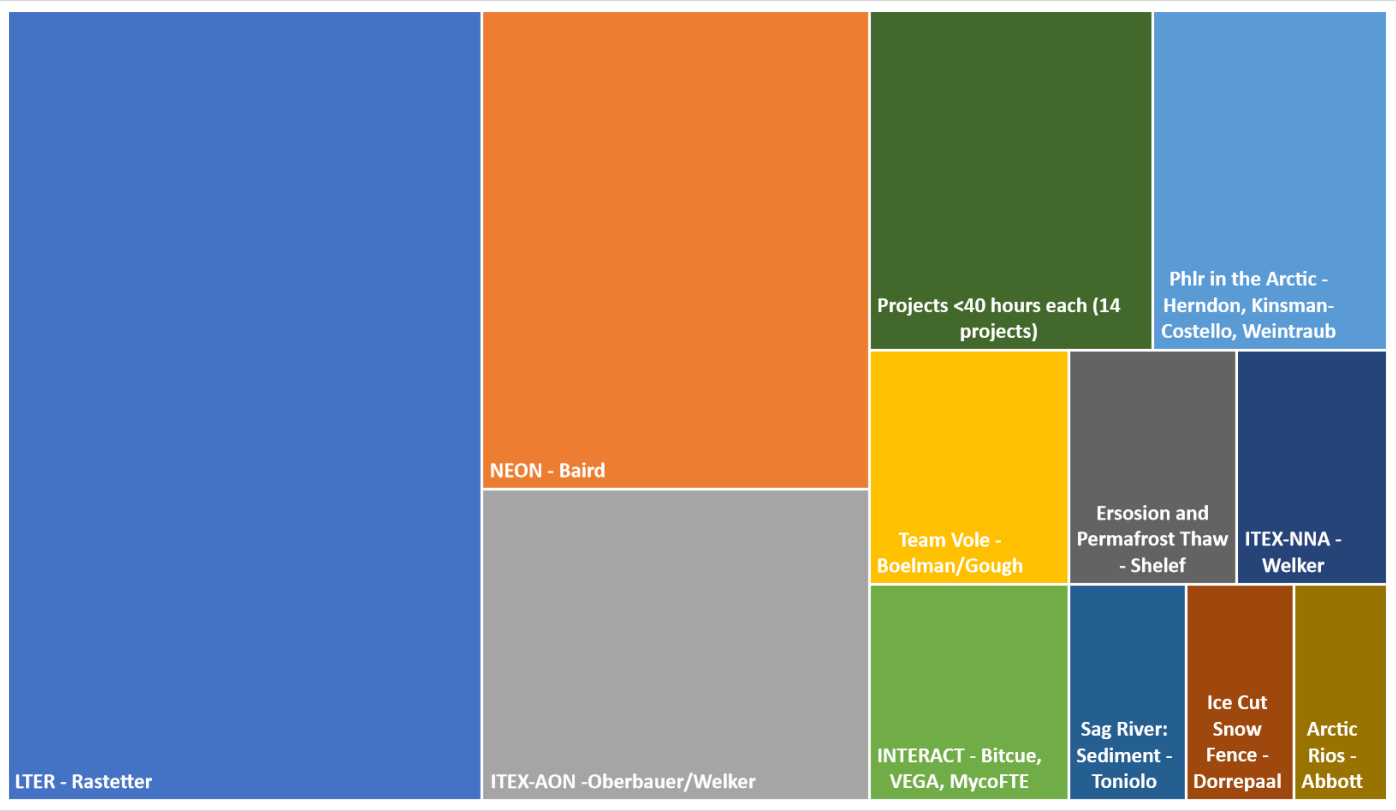
- Examples of Assistance (Not exhaustive):
  - Met Station setup, downloads, and troubleshooting
  - Phenology and NDVI measurements
  - River Discharge
  - Soil sampling
  - Tussock tiller measurements
  - Pollinator Camera Traps

REMOTE ACCESS

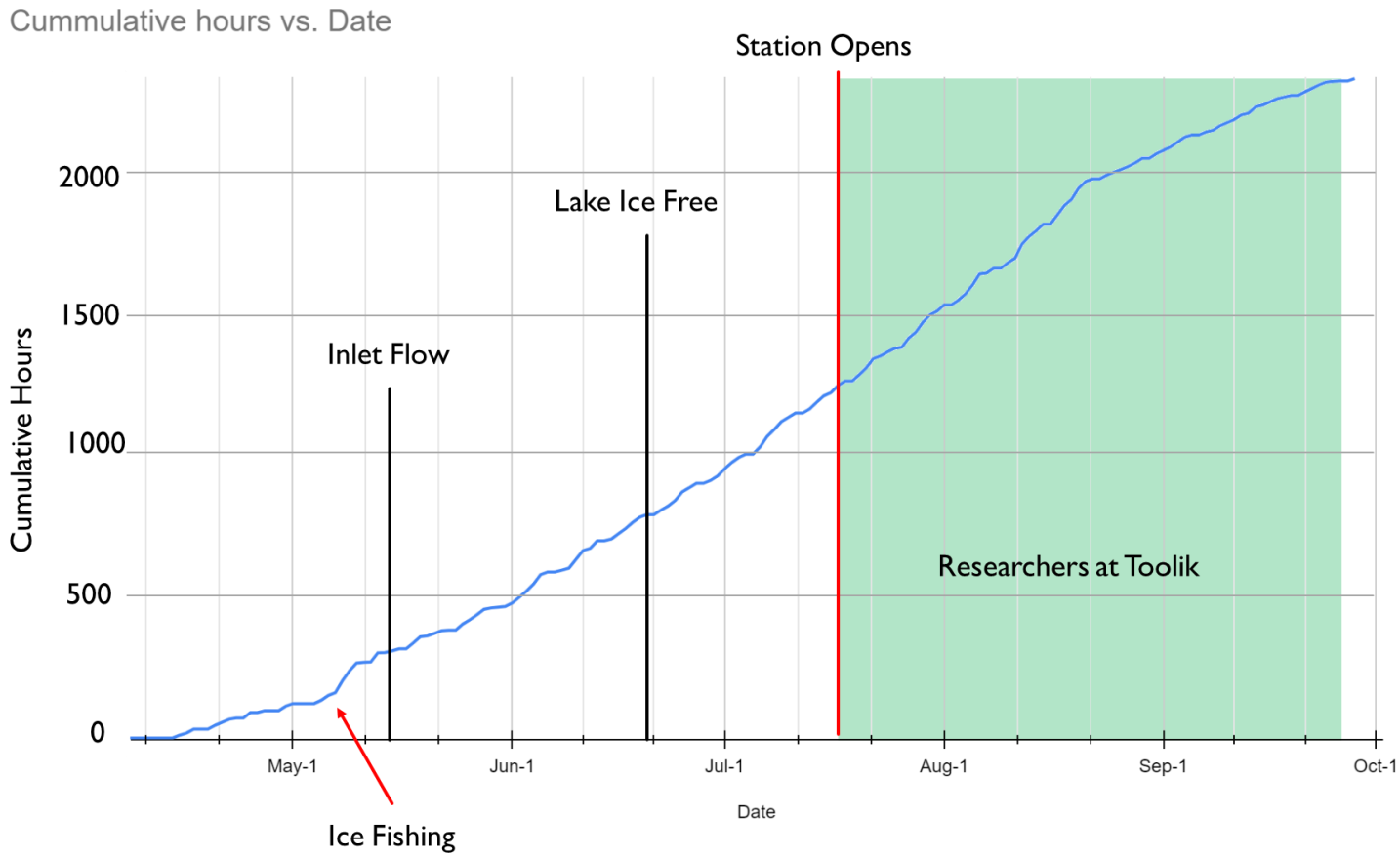
Remote Access to 27 projects

<u>Remote Access helped support Student and post-doctoral research</u>
4 Post-docs ~110 hours
12 PhD students ~ 320 hours
4 MS Students ~ 90 hours
>6 Undergraduate Students ~200 hours

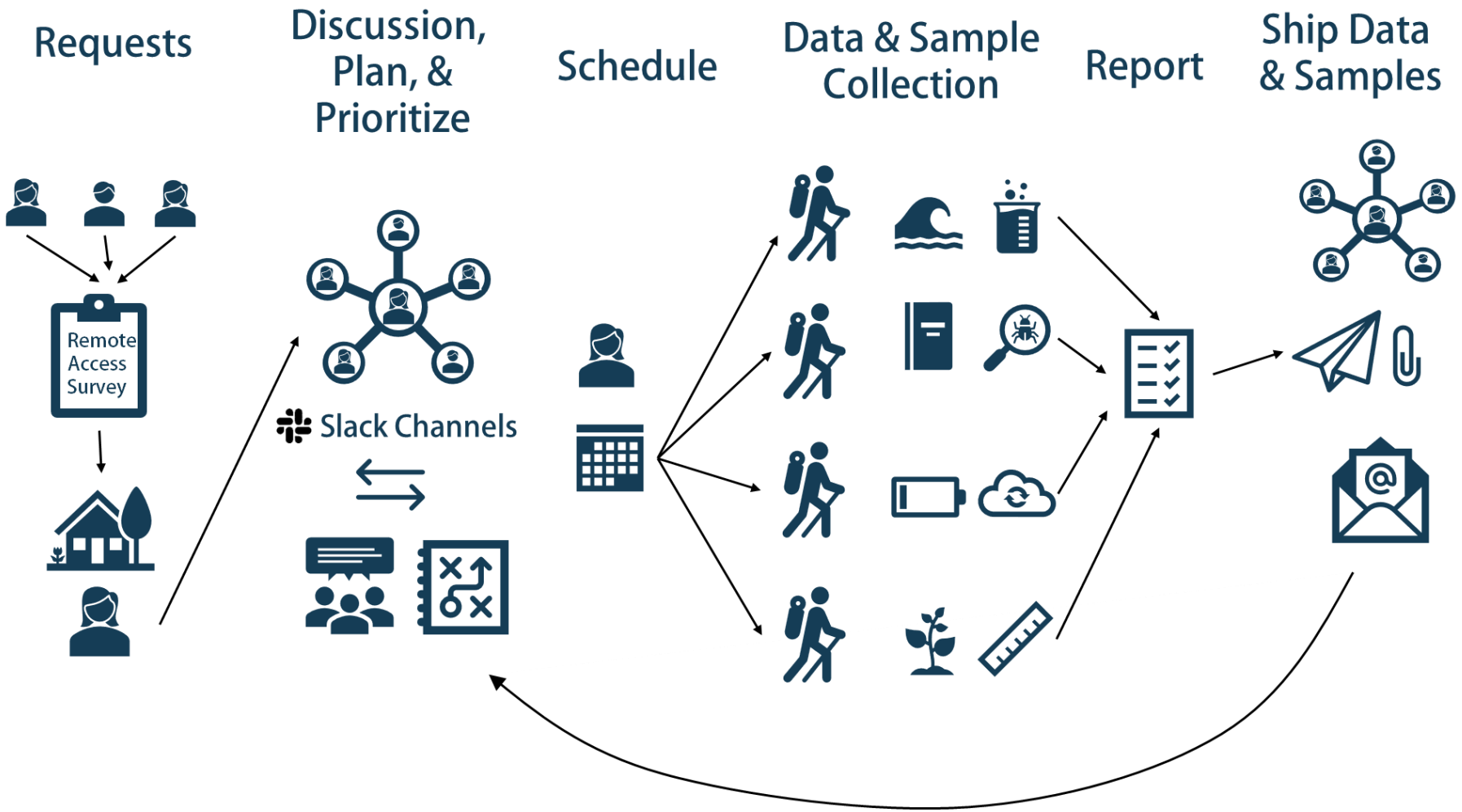
Hard to calculate for some of these exactly how many hours are for students and post-docs due to their projects being part of a large program.



REMOTE ACCESS THROUGH SEPT 2020



REMOTE ACCESS - STRUCTURE



REMOTE ACCESS - SUCCESSES

- Hired all staff from within Alaska to reduce the risk of COVID.
- Lessons were learned in what the level of detail were needed to functionally communicate.
  - Details in the protocols from researchers.
  - Details in the questions to clarify from the TFS staff.
- Established a mechanism to help support more projects at Toolik throughout the year.
- Successfully supporting 27 projects.
  - Projects supported were large collaborative NSF projects down to fieldwork for a graduate thesis.

COMMUNICATION - SLACK

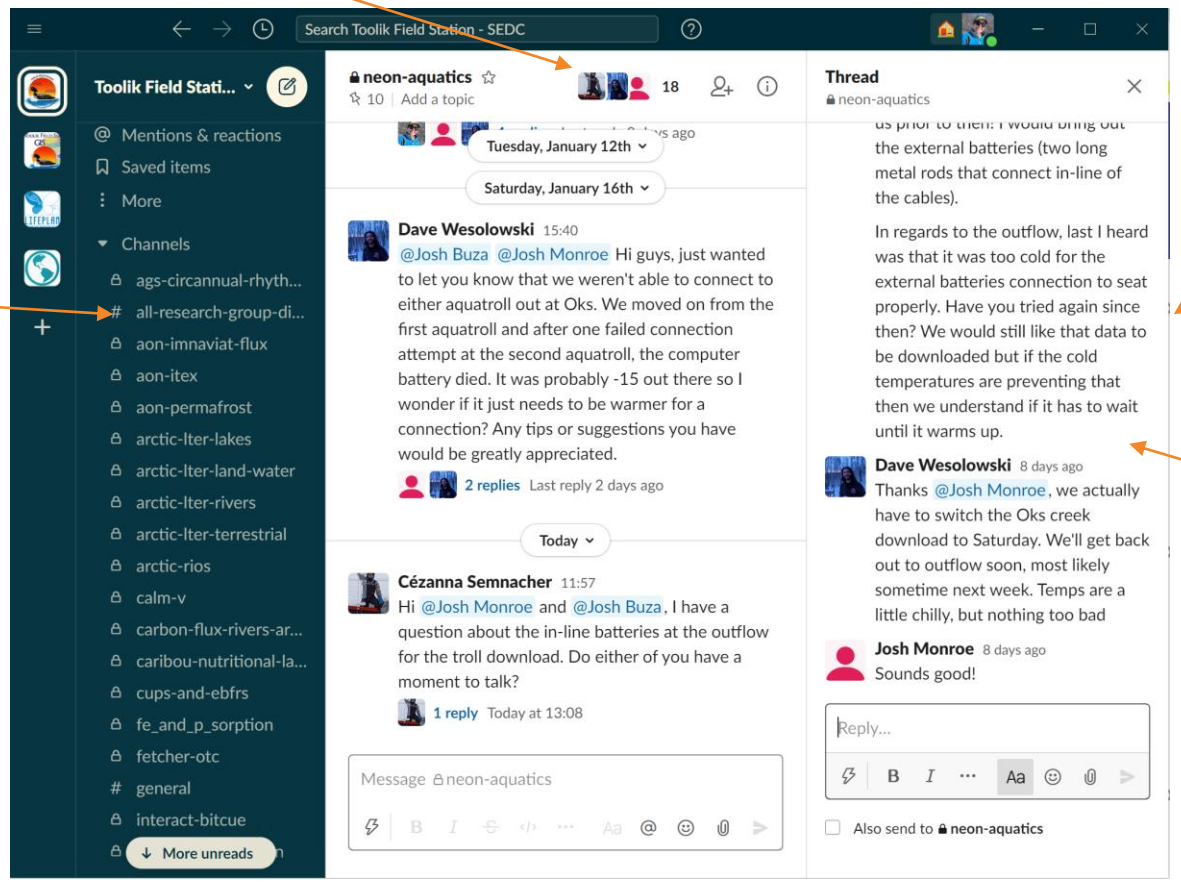
- Channels for each project kept correspondence organized and not lost in an inbox.
- Easy and transparent communication between TFS staff and the researchers.
  - Including everyone in the conversation rather than passing on information
  - Added ability to call or video chat with researchers
- Easy sharing of protocols and files

COMMUNICATION - SLACK

All researchers and TFS staff involved with a project in the same channel

= open channel for all to discuss

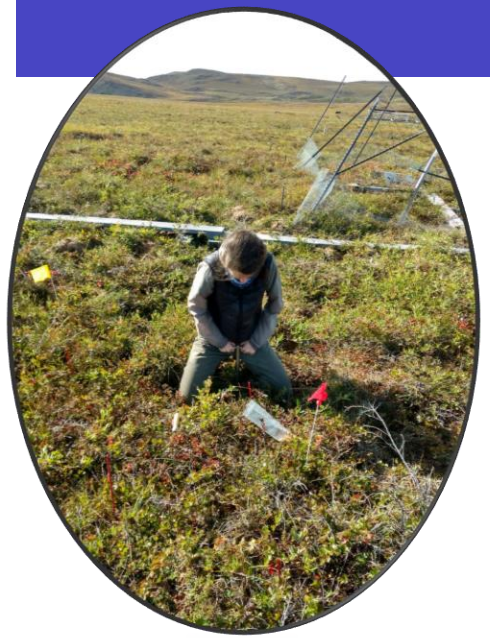
🔒 = Closed channel for each project, so only assigned members can see the posts.



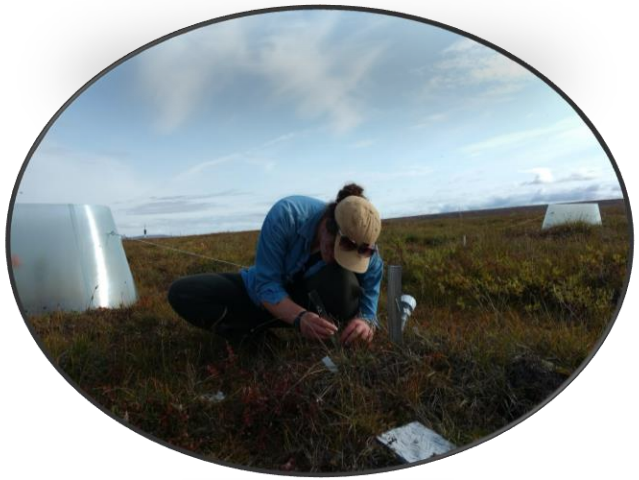
Threads are used to respond to specific questions or topics

Using the @ symbol you can direct questions to a specific person

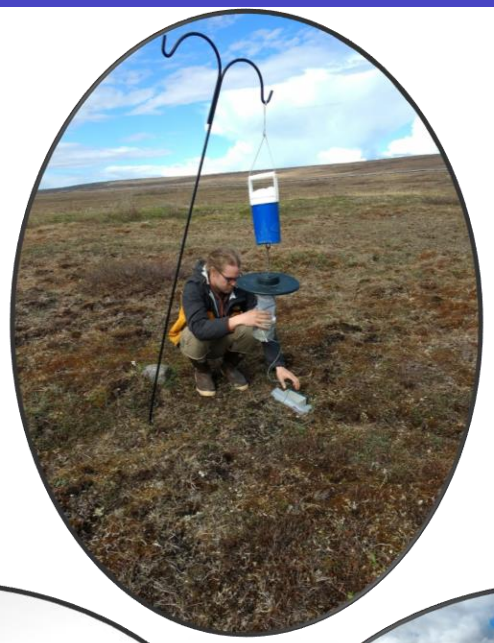
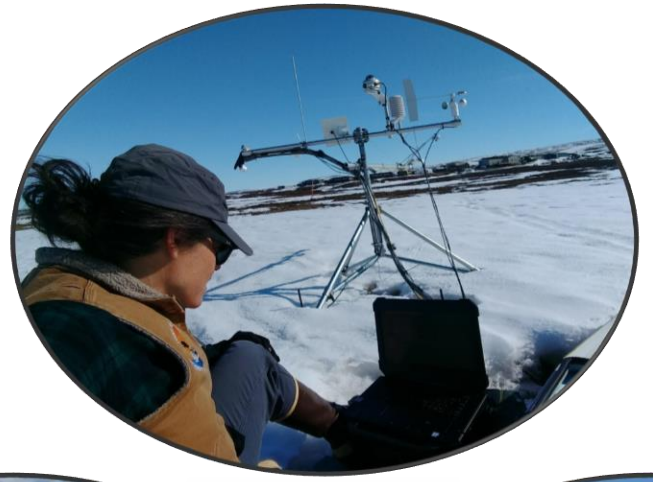
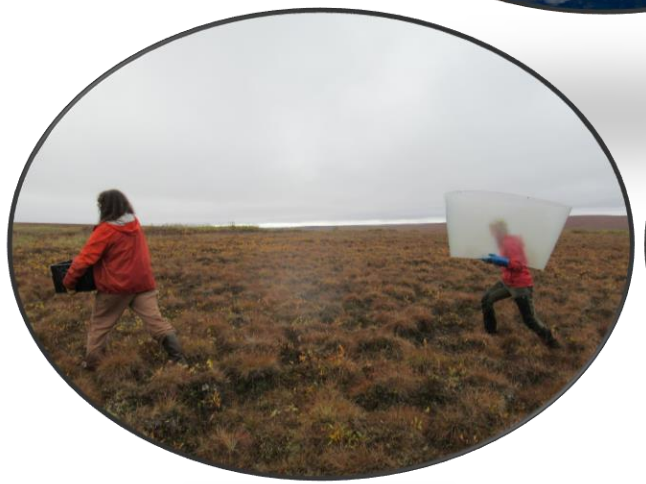
REMOTE ACCESS EXAMPLES





REMOTE ACCESS EXAMPLES CONTINUED

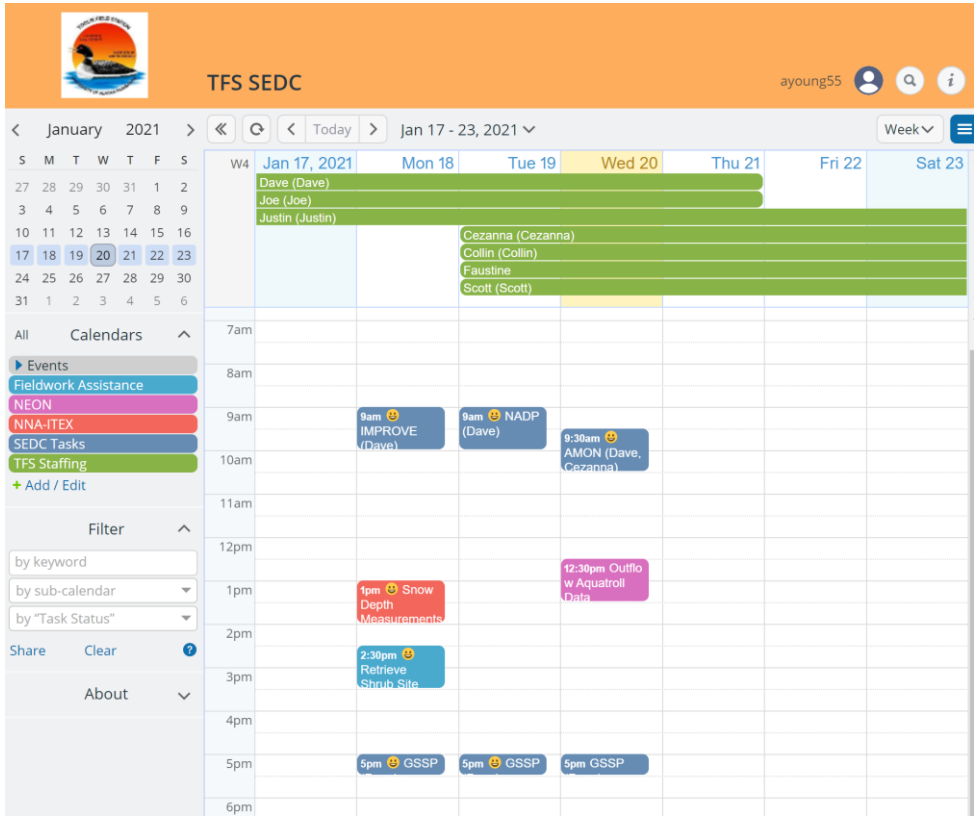






WINTER REMOTE ACCESS

- Winter Remote Access
  - 20-40 hours of remote access per week.
  - EDC staff at Toolik year-round working with Maintenance staff
  - Activities:
    - Autonomous Equipment
      - preventative maintenance checks
      - data download
      - Power system charging and repairs
      - Sensor swap
    - Snow depth measurements
    - Lake Ice
      - Ice thickness measurements
      - Sonde casts
      - Water sampling and filtering
    - Atmospheric Measurements

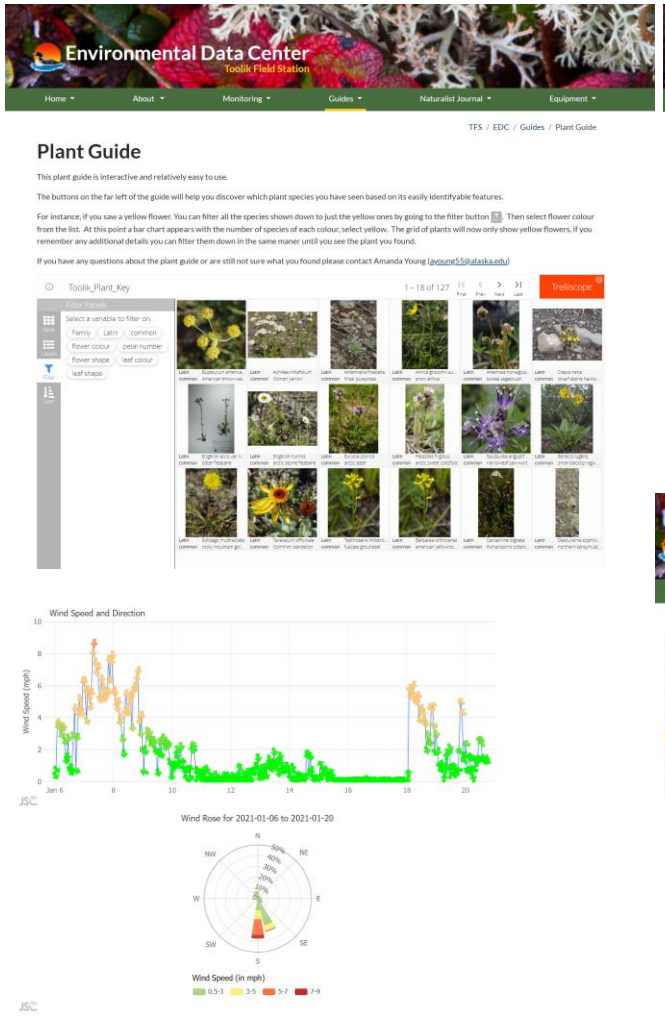
REMOTE ACCESS GOING FORWARD

- Continue to provide Remote Access to users who cannot make it to Toolik
  - Year-round support
- Provide additional field support to researchers at Toolik
- Continue to improve communication between the SEDC and researchers
  - Slack
- Calendar of staffing, remote access, and field assistance for researchers to see when their sampling is scheduled.



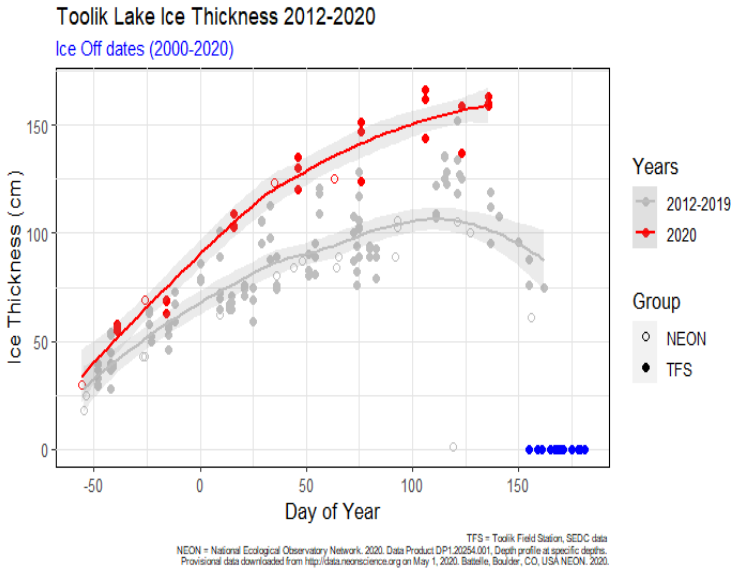
EDC WEBSITE - UPDATES

- In addition to the revamping of the whole website.
- Guides
  - Added an interactive plant guide for those that want to identify plants by flower colour, flower shape, petal number, etc.
  - Local bird calls to the bird guide
- Abiotic Monitoring
  - Snow Depth Measurements
  - Ice Thickness Measurements
  - Wind Speed and Direction chart in addition to the wind rose.



DISCUSSION / FEEDBACK

Baseline Datasets



Remote Access