

January 2026



# 2025 Environmental Data Center Report

Oct 1, 2024 – Sep 30, 2025 Report

# EDC Mission Statement



- The EDC was developed to meet the needs of the scientific community.
- Mission:
  - Collect and manage long-term baseline environmental and biological data
  - Maintain a suite of common-use lab and field equipment
  - Assist in the collection of data through fieldwork assistance & Remote Access





# Staffing

# EDC Year-round Staff



- **Amanda Young – Spatial and Environmental Data Center Manager**
  - PhD in physical geography
  - Enjoys working with plants and data
- **Mayra Melendez-Gonzalez – EDC Technician**
  - BS in Biological Sciences
  - Background in Arctic and alpine ecology with a keen skillset in instrumentation and aquatic sampling
- **Abby Jackson – EDC Technician**
  - MS in Ecology
  - Background in soils ecology of cold climates with a special inkling for nematodes
- **Colin Edgar – Met Station Technician (0.25 time)**
  - Background in instrumentation, renewable energy, and eddy covariance measurements



# Seasonal Staff



## Seasonal Technicians

- Sara de Sobrino
  - Plant ecology



## Naturalist

- Seth Beaudreault
  - Animal and birder extraordinaire
  - Worked at Toolik since 2014





# Facilities

# Facility

EDC moved to old Shower Module


- Year-round offices and multipurpose space.

Lab Check in check out

SCUA Inventory - updated monthly



WELCOME TO YOUR TOOLIK LAB SPACE

Read this document to understand lab check-in and check-out expectations.   
Checking out will require a lab walk-through with a member of the EDC before 5:30 pm the day prior to your departure day.

Common acronyms:

<b>SRS</b>	Support Request System	myToolik website -> Support -> Request Support
<b>Ops</b>	Operations. Includes Station Manager and FOAs	Station Managers: Chad Diesinger, Lindsey Clark, Mike Reynolds FOAs: Mandy Daumiller, Paul Baker, Jessie Aguilar Umaña
<b>Logistics</b>	Logistics team in Fairbanks	Faye Ethridge, Stevie Goetz
<b>EDC</b>	Environmental Data Center	Amanda Young, Mayra Meléndez González, Abby Jackson, Sara de Sobrino
<b>GIS</b>	GIS & Remote Sensing team	Randy Fulweber, Rachel de Sobrino, Jorge Noguera Tapia, Adam Chavez
<b>Safety</b>	On-Site EMT	Scott Filippone, Lelo Morales
<b>FOA</b>	Field Operations Assistant	Mandy Daumiller, Paul Baker, Jessy Aguilar Umaña
<b>MEF</b>	Maintenance, Equipment, Fabrication	Joe French, Collin Fossum, Kevin Williams, Will Jasinevicius, Ben Larson



# Data and Equipment Use

# Naturalist Journal

- Remains the top page from the TFS website to be visited.
- Consistent viewership over the past three years.

Year	Views	Unique IP's	Time Viewing
2021-2022	10,803	1,754	5m 37s
2022-2023	12,016	2,067	5m 45s
2023-2024	11,922	1,521	7m 07s
2024-2025	12,976	1,782	7m 22s

## TFS Naturalist Journal

Date of Journal

2025-06-20

<< first

< previous

next >

last >>

Friday, 20 June 2025 at 5:30 pm.

Share this entry

### General Comments

The final stretch of avian point counts was completed this morning from mileposts 313-338. Mild temperatures, few mosquitos, and a light breeze allowed for near perfect counting conditions so birds could be heard from great distances. New World Warblers were still very few and far between, with just a single Wilson's Warbler and a couple Yellow Warblers detected. One Old World Warbler, an Arctic Warbler, was detected near Ice Cut. I got to see a skinny Red Fox stalking the tundra in the low-angled light near the Sag River, the family of Muskox again at Happy Valley with plenty of youngsters in it, and a lot of recently blooming Arctic Lupine.

I've been checking on a historical Gyrfalcon nest and found the adult female closing her eyes and napping this morning while two or three gray and downy little ones hunkered below her. Keeping the chicks warm hasn't been an issue at all given this recent heat wave and hopefully they are able to keep cool when the afternoon sun hits their nesting cliff. There were a couple Canada Geese perched up on the cliff within 10 feet of the falcon nest - something I've noticed several times before. Strange bedfellows.

The Sagavanirktok River is still running fairly high and muddy, and I heard Spotted Sandpipers calling from its banks in a couple spots. Much of their feeding habitat is still under water so they must be eager for the river to retreat back to a normal width. Back here at the station I checked on the Northern Shrike nest and it appeared that a chick still hasn't hatched. -Seth



Arctic Lupine

Photo credit: ©Seth Beaudreault

### Birds Seen (50 species)

American Golden Plover  
American Pipit  
American Robin  
American Tree Sparrow

### Mammals (5 species)

Species Seen Tracks  
Arctic Ground Squirrel

### Insects Seen (6)

Bee/Wasp  
Butterfly  
Hornetfly  
Midge

TFS / EDC / Naturalist Journal / TFS Naturalist Journal

### Daily Metrics for 20 June 2025

Air Temperature

70°F (21°C)

Wind Speed

4mph

Wind Direction

N

Cloud Cover

65-84%

Snow Cover

1-5%

Greenness

3

Fall Colors

0

Ice on Lake

95-99%

Ice on Inlet River

0%

See Brooks Range: Yes

Aurora seen: No

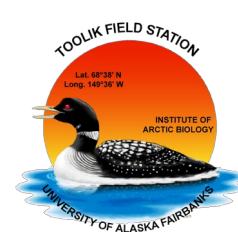
Snowed today: No

Inlet river flowing: Yes

Ground fog: No

Moat around lake: Yes

Moat width: 25ft



# Data Usage



## EDC Webpage and Direct Requests

- Met station data requests: 1476 files, 321 downloads, by 96 people

## Arctic Data Center (data has DOI)

Dataset	Downloads	Views
Phenology	353	227
Bird Point Counts	110	61
Met Station Data	187	38
Naturalist Journal - Birds	212	77
Naturalist Journal - Mammals	92	72
Naturalist Journal - Insects	84	59



NSF  
**ARCTIC  
Data  
Center**



# Arctic Data Center Portal



Hosted by the Arctic Data Center

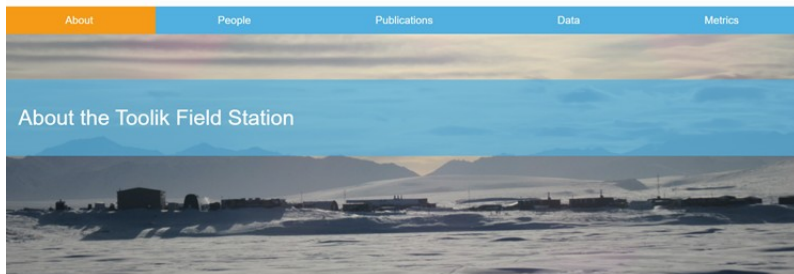
Sign in with ORCID



## Toolik Field Station

The Toolik Field Station (TFS) has been a major site for research in the North American Arctic since 1975. Much of what is known about structure and function of arctic terrestrial and aquatic ecosystems, effects of climate change, and feedbacks to global climate has emerged from long term, process-based ecological research at TFS. This portal provides access to datasets collected as part of the Toolik Field Station program.

## 26 datasets added in 2025



For more information about Toolik Field Station, please see our main [website](#).

## Overview

The Toolik Field Station (TFS) has been a major site for research in the North American Arctic since 1975. Much of what is known about structure and function of arctic terrestrial and aquatic ecosystems, effects of climate change, and feedbacks to global climate has emerged from long term, process-based ecological research at TFS. TFS-based work has resulted in significant discoveries on adaptations of organisms to the Arctic and population-level changes in animal and plant distributions and phenologies. Because climate is changing rapidly in the Arctic, continuing research into mechanisms of ecosystem response and feedbacks is a high priority. This need and ongoing interest by scientists from many disciplines in use of TFS promise a steady demand for TFS science support in the future. TFS supports the [Arctic Long-Term Ecological Research program \(LTER\)](#), projects in the [Arctic Observatory Network program \(AON\)](#), NASA's [Arctic Boreal Vulnerability Experiment \(ABoVE\)](#), the [Earthscope Transportable Array](#), and is a core site for the [National Ecological Observatory Network program \(NEON\)](#). TFS is a founding partner in the EU-sponsored [International Network for Terrestrial Research and Monitoring in the Arctic \(INTERACT\)](#), which links field stations around the circumpolar Arctic, and a member of the [Organization of Biological Field Stations \(OBFS\)](#). At least 993 peer-reviewed journal articles, 161 books or book chapters and 144 dissertations and theses have been published on research based at TFS.



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AboutPeoplePublicationsDataMetrics

Search

Search these datasets

Search

Key WordsAuthor NamesYear

Key WordsAuthor Names

1950to2026

DATASETS 1 TO 25 OF 558

123...23Next

Sort byMost recent

Hide Map

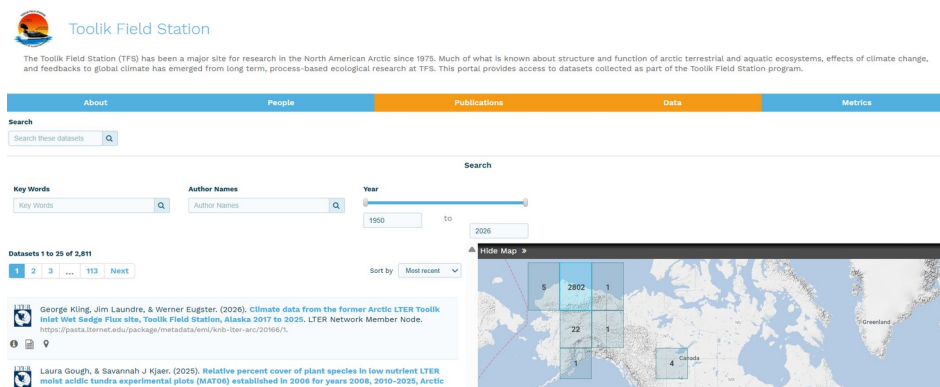
Amanda B. Young, Brie van Dam, Anja Kade, Christie Haupt, Seth Beaudreault, Jake Schas, Jade Lawrence, Juliette Funck, Adeline Murthy, Aart Nugteren, Justin Johnson, Chad Diesinger, Faye Ethridge, Robin Rauch, Emma Boone, Joe Huebner,

## [Toolik Arctic Data Center portal](#)

# DataOne Toolik Portal



- 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 558 datasets in the ADC portal to 2811 datasets!
- If these portals are used and appreciated by the community, we will keep them up.



[Toolik DataONE portal](#)



# Data and Equipment in Use in Publications

## JGR Earth Surface






### RESEARCH ARTICLE

10.1029/2024JF007832



#### Key Points:

- Ground-penetrating radar, in situ measurements, soil cores, and forward

























### Using Ground-Penetrating Radar to Infer Ice Wedge Characteristics Proximal to Water Tracks

Rachel H. Harris<sup>1</sup> , Sarah G. Evans<sup>1</sup> , Scott T. Marshall<sup>1</sup> , Sarah E. Godsey<sup>2</sup> , and Andrew D. Parsekian<sup>3,4</sup> 

## Tundra Plant Canopies Gradually Close Over Three Decades While Cryptogams Persist

Katlyn R. Betway-May<sup>1,2</sup> , William A. Gould<sup>1</sup> | Sarah C. Elmendorf<sup>3,4</sup> , Jeremy L. May<sup>5</sup> | Robert D. Hollister<sup>2</sup> | Steven F. Oberbauer<sup>6</sup> | Amy Breen<sup>7</sup> | Benjamin J. Crain<sup>8</sup> | Ana Maria Sanchez Cuervo<sup>9</sup> | Marilyn D. Walker<sup>10</sup> | Donald A. Walker<sup>11</sup>

## Tundra Vegetation Community Type, Not Microclimate, Controls Asynchrony of Above- and Below-Ground Phenology

Elise C. Gallois<sup>1,2</sup> , Isla H. Myers-Smith<sup>1,3</sup> , Colleen M. Iversen<sup>4</sup> , Verity G. Salmon<sup>4</sup> , Laura L. Turner<sup>5</sup> , Ruby An<sup>6</sup> , Sarah C. Elmendorf<sup>7,8</sup> , Courtney G. Collins<sup>9,10</sup> , Madelaine J. R. Anderson<sup>11</sup> , Amanda Young<sup>12</sup> , Lisa Pilkinton<sup>1</sup> , Gesche Blume-Werry<sup>13</sup> , Maude Grenier<sup>2</sup> , Geerte Fálthammar-de Jong<sup>14</sup> , Inge H. J. Althuizen<sup>15,16</sup> , Casper T. Christiansen<sup>17</sup> , Simone I. Lang<sup>18</sup> , Cassandra Elphinstone<sup>19</sup> , Greg H. R. Henry<sup>19</sup> , Nicola Rammell<sup>19</sup> , Michelle C. Mack<sup>12</sup> , Craig See<sup>20</sup> , Christian Rixen<sup>21,22</sup> , Robert D. Hollister<sup>23</sup> 

88 publications in 2021  
84 publications in 2022  
66 publications in 2023  
72 publications in 2024  
47 publications in 2025

Using spaceborne SAR and ground-based measurements to identify spatial patterns in soil moisture and seasonal thaw timing in permafrost environments of Alaska

W. Brad Baxter<sup>1\*</sup>, Zachary Hoppinen<sup>2</sup>, Kristofer Lasko<sup>3</sup>, Tate Meehan<sup>2</sup>, David Brodylo<sup>1</sup>, Taylor D. Sullivan<sup>1</sup>, Amanda J. Barker<sup>1</sup> and Thomas A. Douglas<sup>1</sup>

# Common Use Equipment



## New Equipment

- New federal snow auger
- Ultrasonic cleaner
- Peristaltic pumps
- Few types of fishing nets
- Laminar flow fume hood
- Soil Recovery Probes
- Vacuum Pump

## Suggested new equipment

- New freeze dryer
- Shelf for the muffle furnace
- LI-600 fluorometer/ porometer
- Thaw probes
- Secchi disk



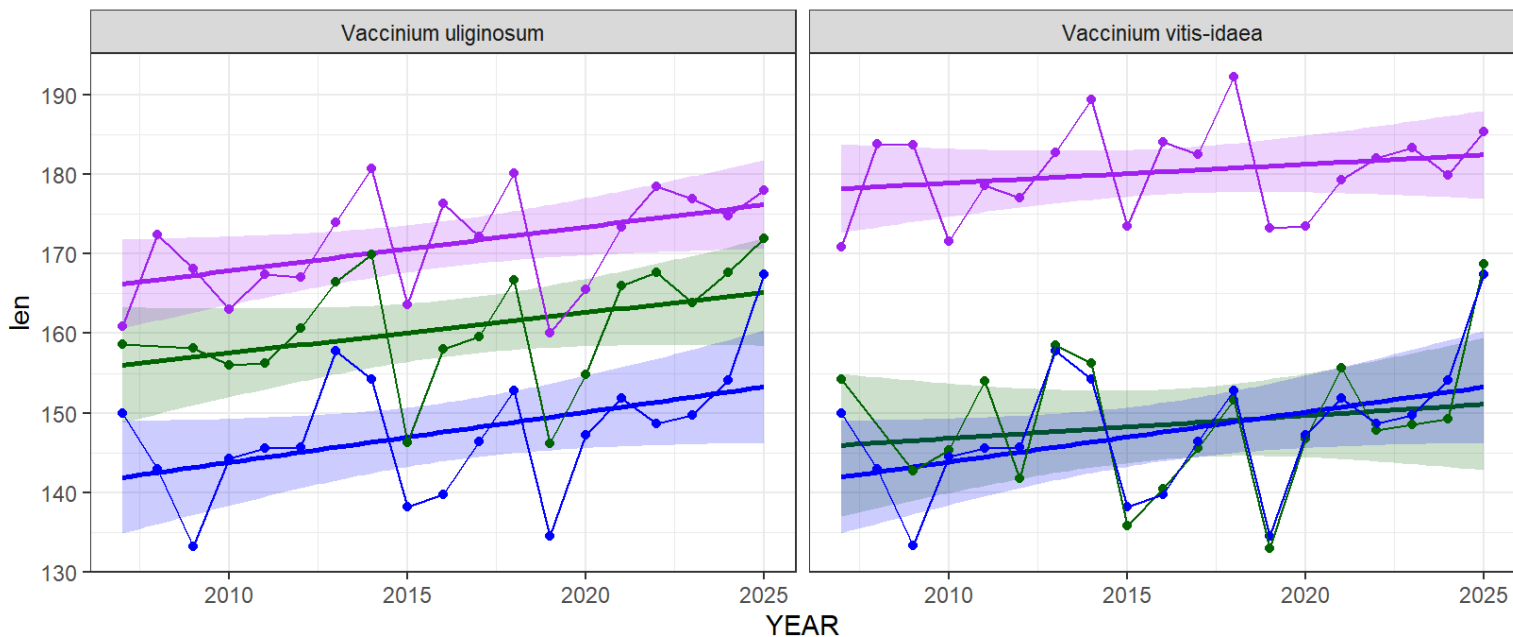


# Baseline Monitoring Biotic

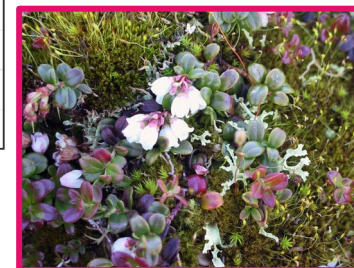
# Biological Monitoring - Phenology



Mean phenophase occurrence

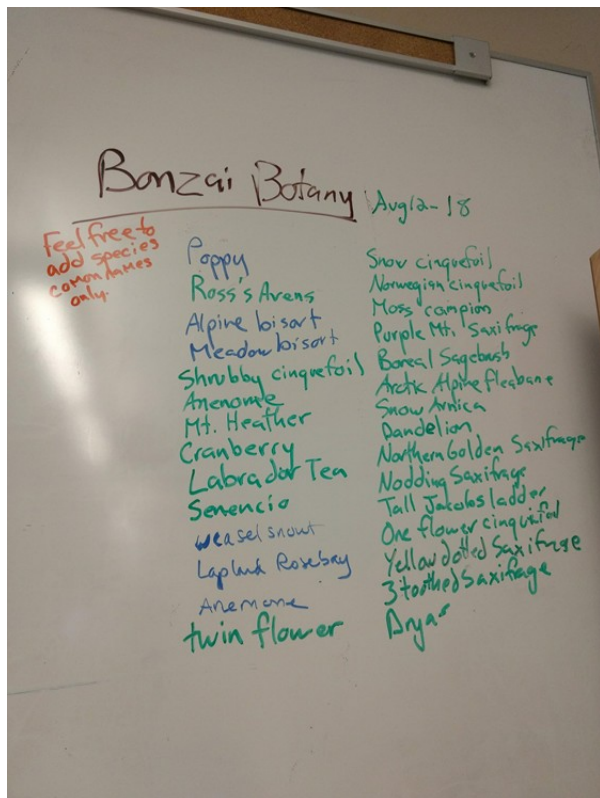
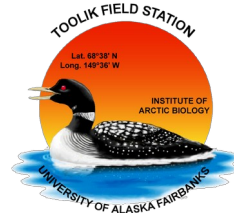


*V. uliginosum*

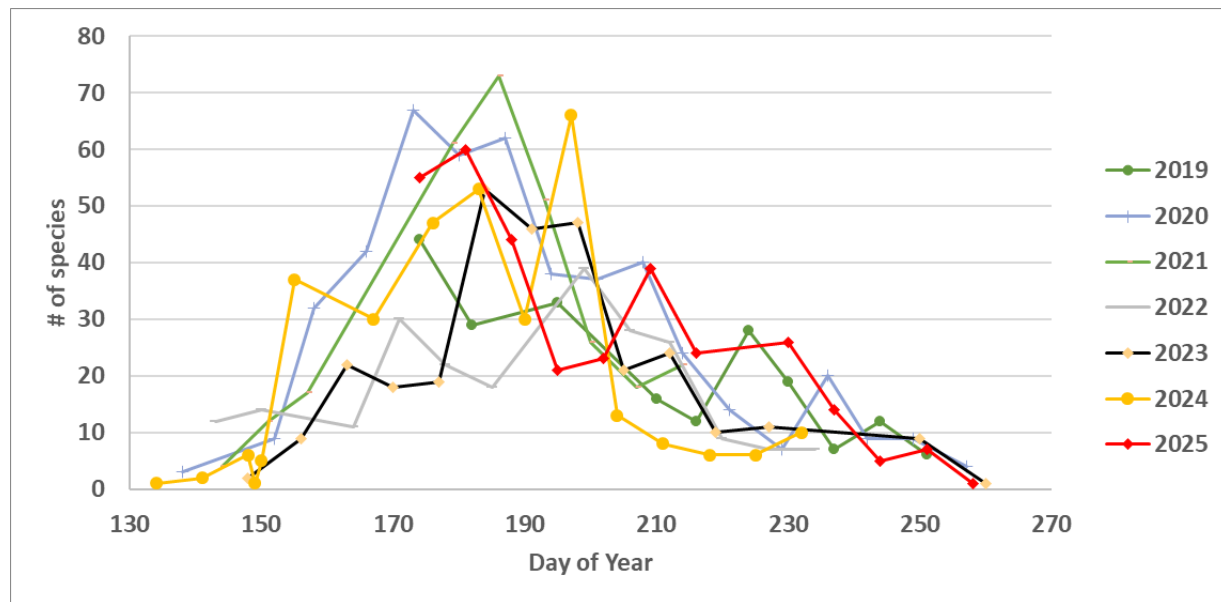


*V. vitis-idaea*

# Biological Monitoring - Bonsai Botany



- Recorded plants in flower during each week
- Common names only so all can participate

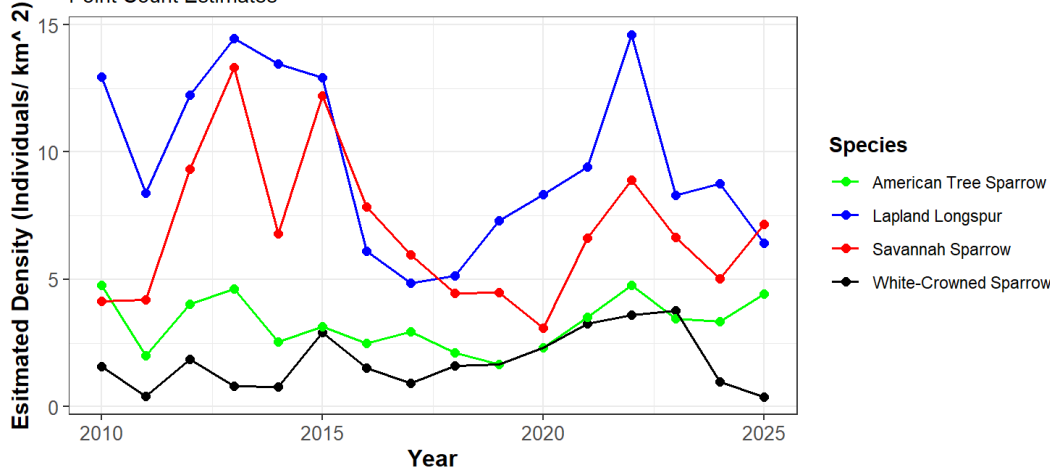


# Biological Monitoring - Avian

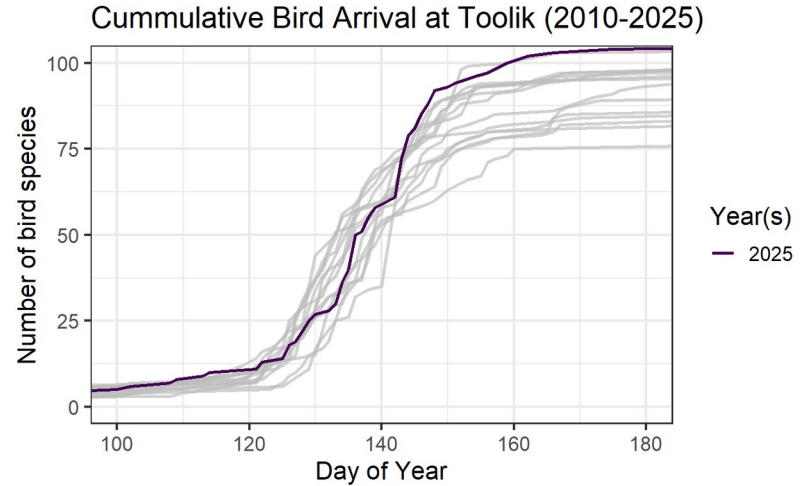


- Avian point counts

Common Song Bird densities around Toolik Field Station  
Point Count Estimates



- Date of arrival of bird species from the Naturalist Journal



# Biological Monitoring - Audio Recordings

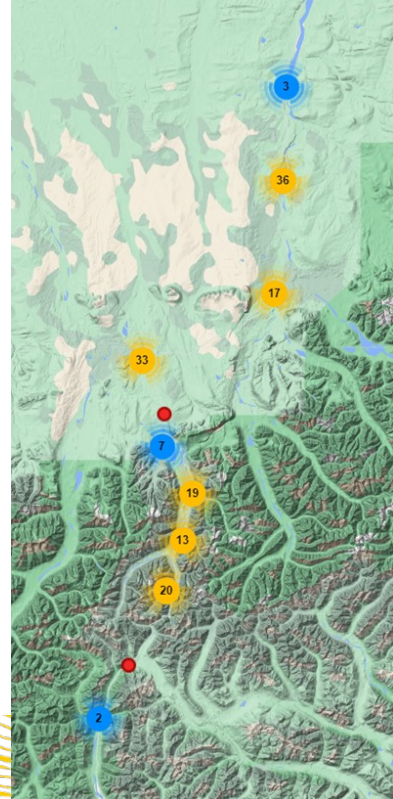
- Audio recording of bird species continues now with 252 recordings from the Toolik area
  - No new calls in 2024-2025
  - Calls are added to the Naturalist Bird Guide



[Northern waterthrush, June 2022](#)



[Surfbird \(Mt Dalton\), June 2022](#)

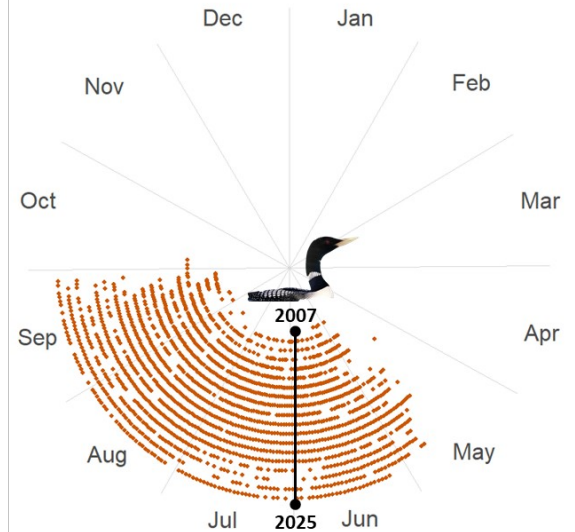
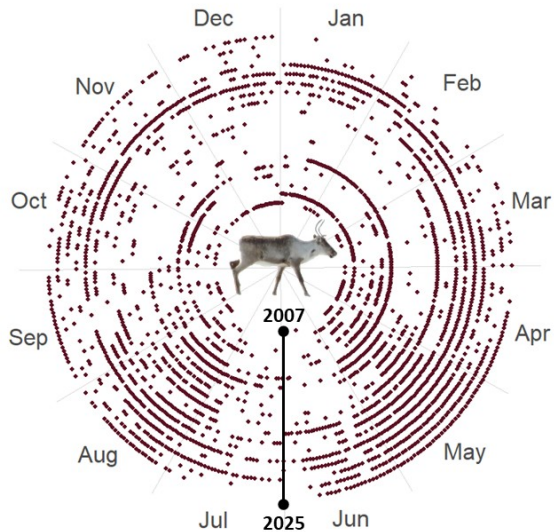
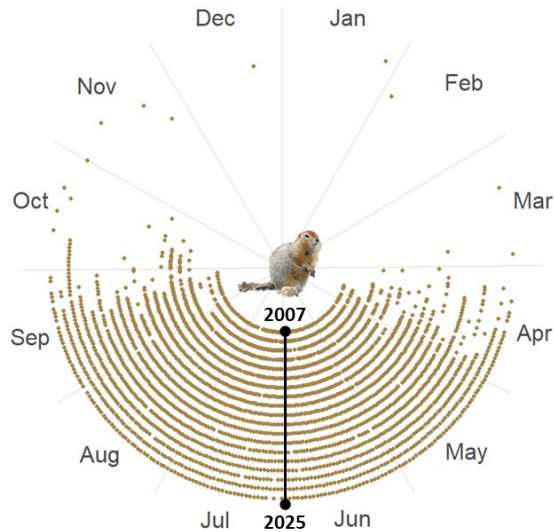


# Biological Monitoring - Animal Observations



- Daily observations from the Naturalist Journal showing observed presence on the landscape.

○ Each ring is a year and each dot is a daily observation.



[Interactive Animals & Birds Tool](#)



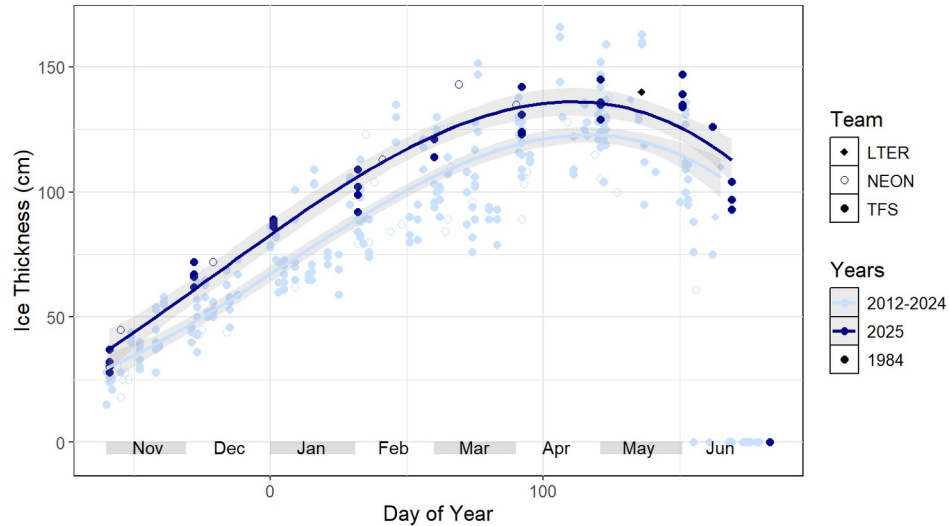
# Baseline Monitoring Abiotic

# Abiotic Measurements - Ice Thickness



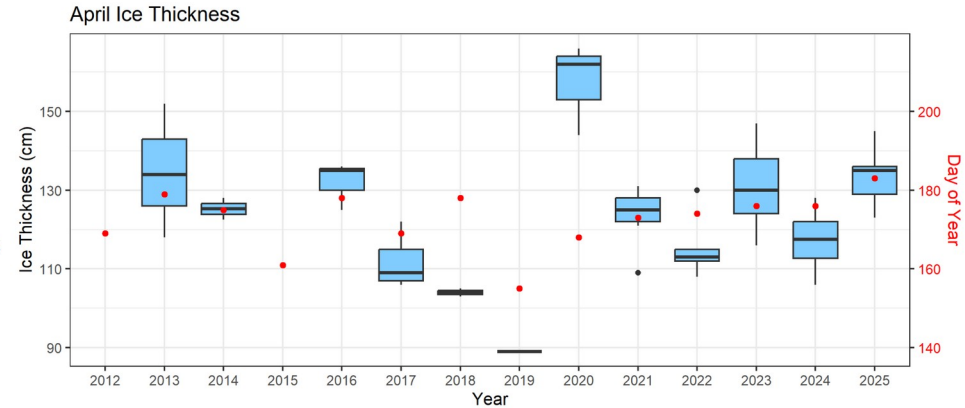
## ● Ice thickness - measured monthly

Toolik Lake Ice Thickness 2012-2025  
Ice Off dates (2012-2025)



TFS = Toolik Field Station, SEDC data  
NEON = National Ecological Observatory Network, 2025. Data Product DP1 20254.001, Depth profile at specific depths.  
Provisional data downloaded from <http://data.neonscience.org> on April 1, 2025. Battelle, Boulder, CO, USA NEON, 2025.  
LTER = Arctic LTER Physical Limnology data from 1975-2021.

## ● Peak ice thickness, measured in April

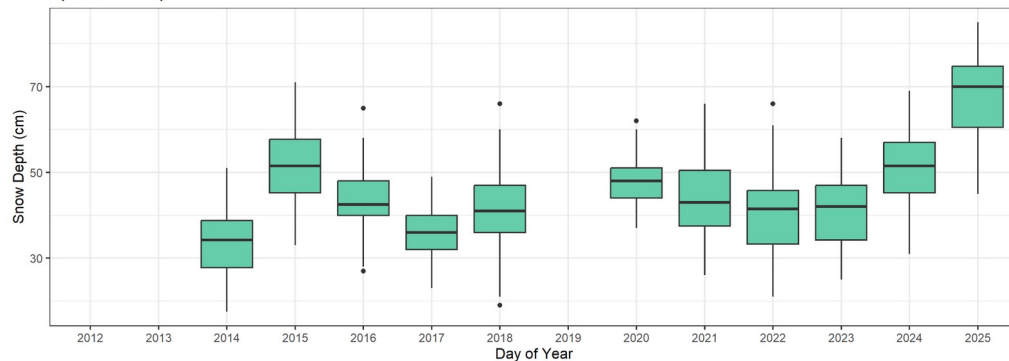


Red dots are dates of ice off (secondary y-axis)



# Abiotic Monitoring - April Snow Depth

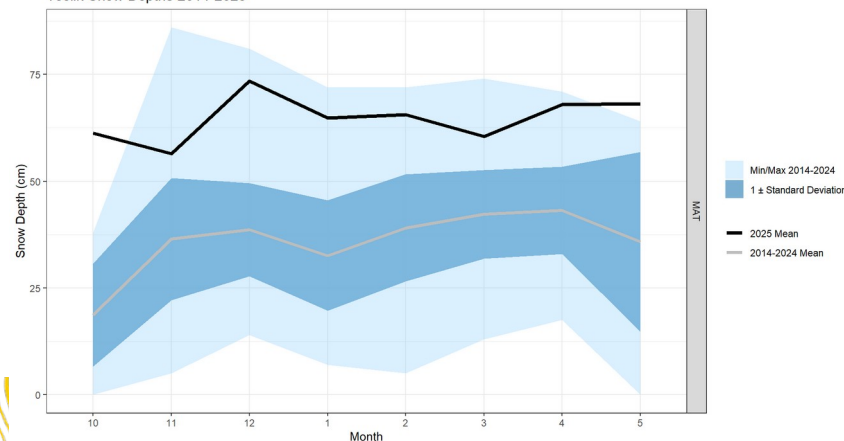
April Snow Depth



- April snow depth in 2025 deeper on average than prior decade.

- Early snowpack in October 2024 lead to higher than average snowpack throughout the snow season.

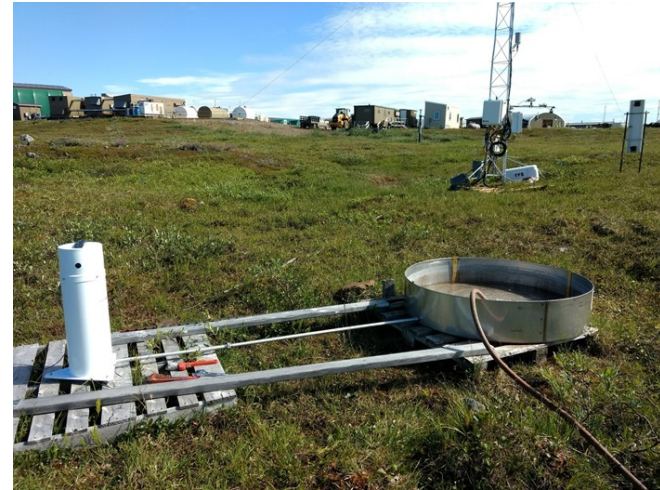
Toolik Snow Depths 2014-2025



# Met Station Report



- TFS Meteorological Data updates
  - QAQC done quarterly and uploaded to the website.
- Frequent communication between Colin Edgar and other EDC staff to troubleshoot issues and installation as they arise.
- Issues in 2025
  - Replacement of UV Sensor for Rose Cory after a leak in the housing
  - Internet issues lead to a 7 day window of no data collected in Sept 2025
- New data visualization





# Network Participation

# Atmospheric Monitoring



- Ozone Monitoring – 2009 to Present (ADC repository of data)
- 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 2025
  - Re-funded by the BLM in 2024 until 2064
  - Funding pulled in 2025, site shut down in September of 2025
- Purple Air – June 2019 to present
  - Particulate matter sampling
  - 2 additional sensors added in 2022
- Mercury Passive Air Sampler – January 2020 to present
  - Changed quarterly
  - Lower than average Mercury for the Arctic





# Participating in Networks



## LIFEPLAN – A Planetary Inventory of Life (Ending at the end of 2025)

- ☐ Weekly spore sampling
- ☐ Camera and audio traps
  - Community training of AI to process data
  - Audio traps
- ☐ Malaise trap
- ☐ Soil sampling



## myThaw

- ☐ Weekly NDVI/snow survey transect
- ☐ Thaw depth, veg height, snow depth
- ☐ Data collected is online at [permafrostthaw.org](http://permafrostthaw.org)



## CoCoRaHS – Community Collaborative Rain, Hail & Snow Monitoring

- ☐ Daily record of precipitation and snow water equivalent



## Aurorasaurus

- ☐ Observations of aurora activity
- ☐ Toolik is an Ambassador member



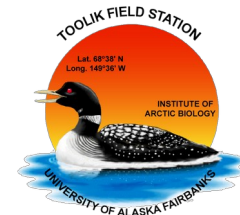
## Fresh Eyes on Ice

- ☐ Monthly ice measurements





# Remote Access



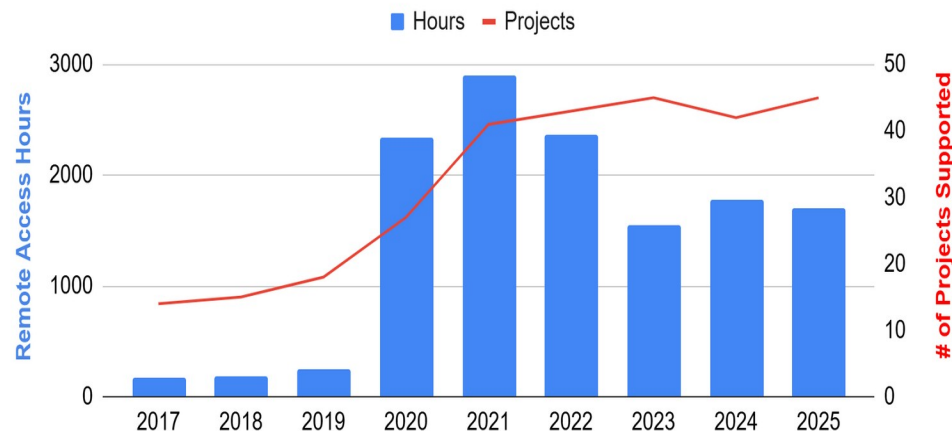
# Field Work Assistance

- 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
- 2021: 2899 hours of assistance to 41 projects
- 2022: 2361 hours of assistance to 43 projects
- 2023: 1543 hours of assistance to 45 projects
- 2024: 1783 hours of assistance to 43 projects
- **2025: 1704 hours of assistance to 45 projects**

## Examples of assistance (Not exhaustive):

- Met Station setup, downloads, and troubleshooting
- Phenology and NDVI measurements
- River discharge and water chem processing
- Soil sampling
- Tussock tiller measurements

Hours and Projects



\*Not all projects supported have hours recorded

# 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
  - Access assistance via snowmachines



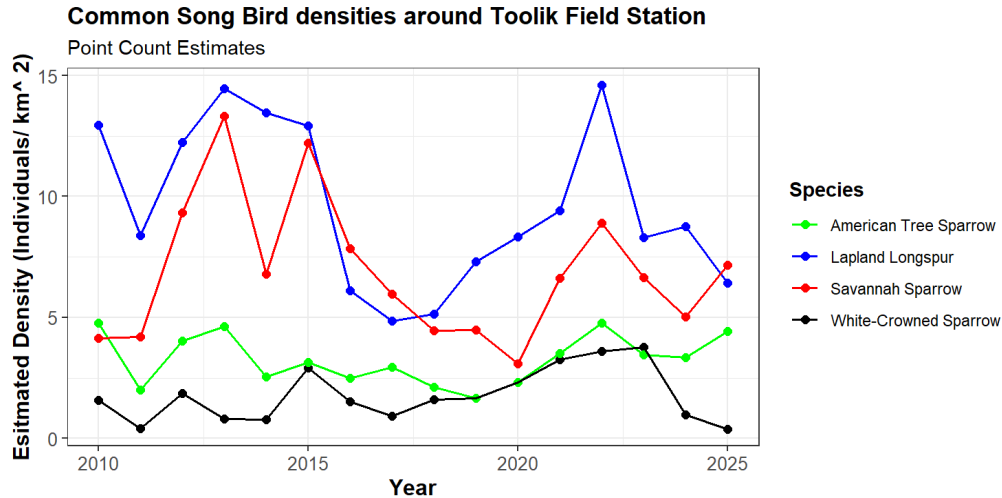
# Let me know if you have any feedback



[ayoung55@alaska.edu](mailto:ayoung55@alaska.edu)

[uaf-iab-toolik-edc@alaska.edu](mailto:uaf-iab-toolik-edc@alaska.edu)

## Baseline Datasets



## Remote Access and Field Support

