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:

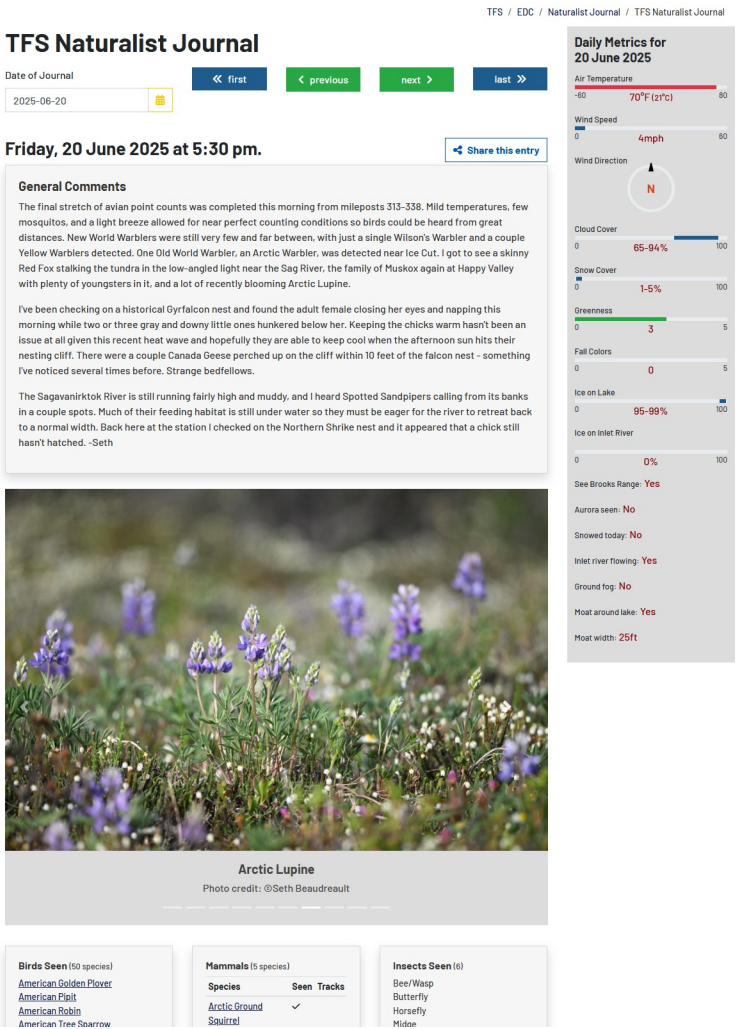
SRS	Support Request System	myToolik website -> Support ->Request Support
Ops	Operations. Includes Station Manager and FOAs	Station Managers: Chad Diesinger, Lindsey Clark, Mike Reynolds FOAs: Mandy Daumiller, Paul Baker, Jessie Aguilar Umaña
Logistics	Logistics team in Fairbanks	Faye Ethridge, Stevie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



Data Usage

EDC Webpage and Direct Requests

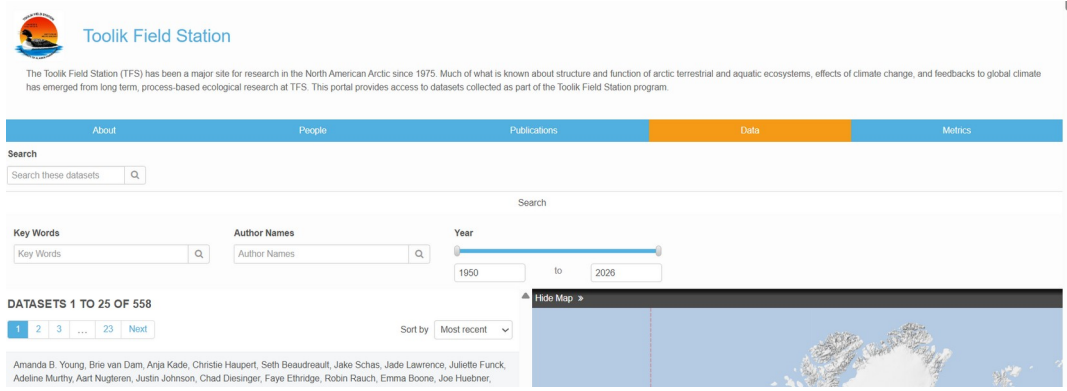
- Met station data requests: 1476 files, 321 downloads, by 96 people

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

Arctic Data Center Portal

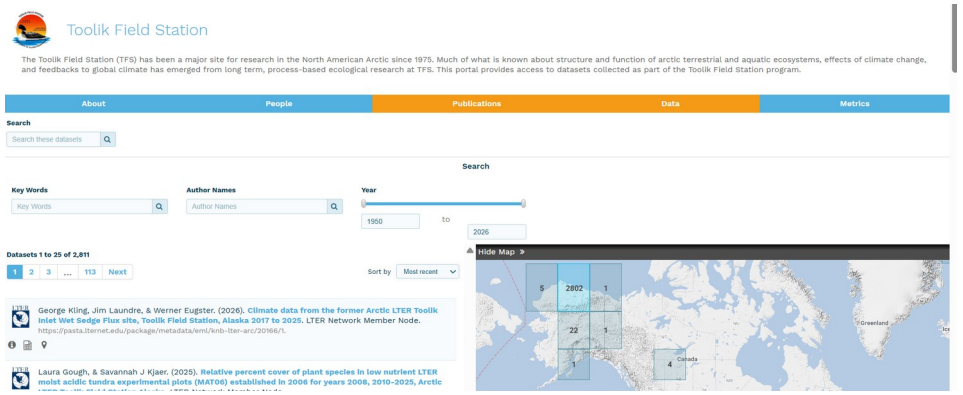
26 datasets added in 2025



[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

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

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

Rachel H. Harris[1], Sarah G. Evans[1], Scott T. Marshall[1], Sarah E. Godsey[2], and Andrew D. Parsekian[3,4]

Tundra Plant Canopies Gradually Close Over Three Decades While Cryptogams Persist

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

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

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

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[1]*, Zachary Hoppinen[2], Kristofer Lasko[3], Tate Meehan[2], David Brodylo[1], Taylor D. Sullivan[1], Amanda J. Barker[1] and Thomas A. Douglas[1]

Common Use Equipment

New Equipment

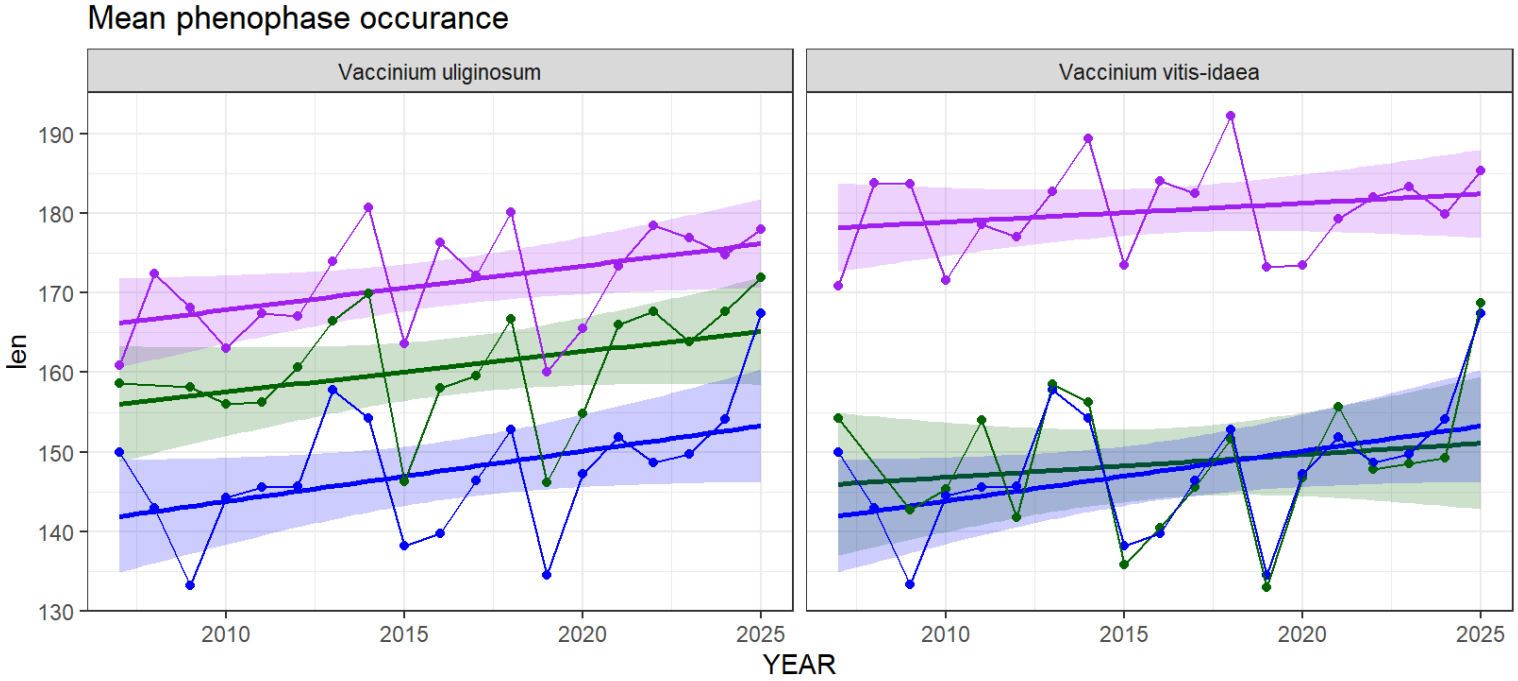
- New federal snow auger
- Ultrasonic cleaner
- Peristaltic pumps
- Few types of fishing nets
- Laminar flow fume hood
- Soil Recovery Probes
- Vacuum Pump

Suggested new equipment

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

Baseline Monitoring
Biotic

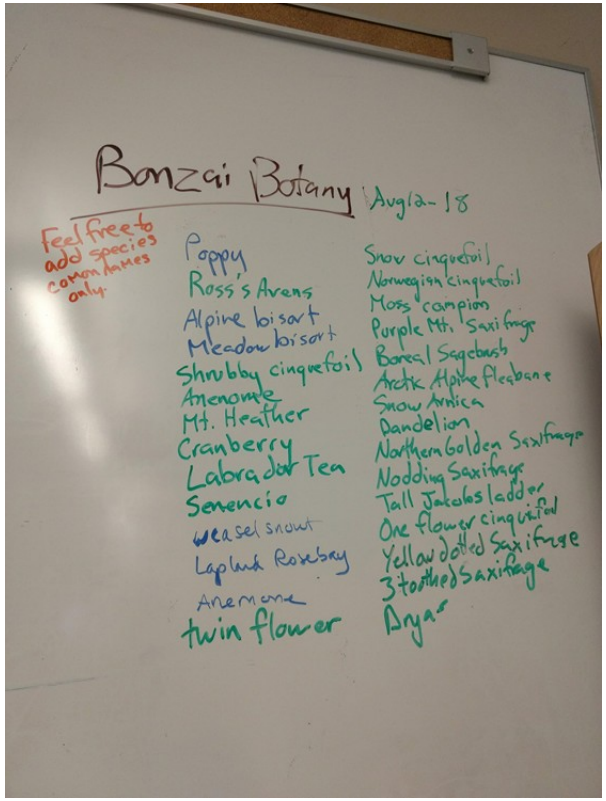
Biological Monitoring - Phenology



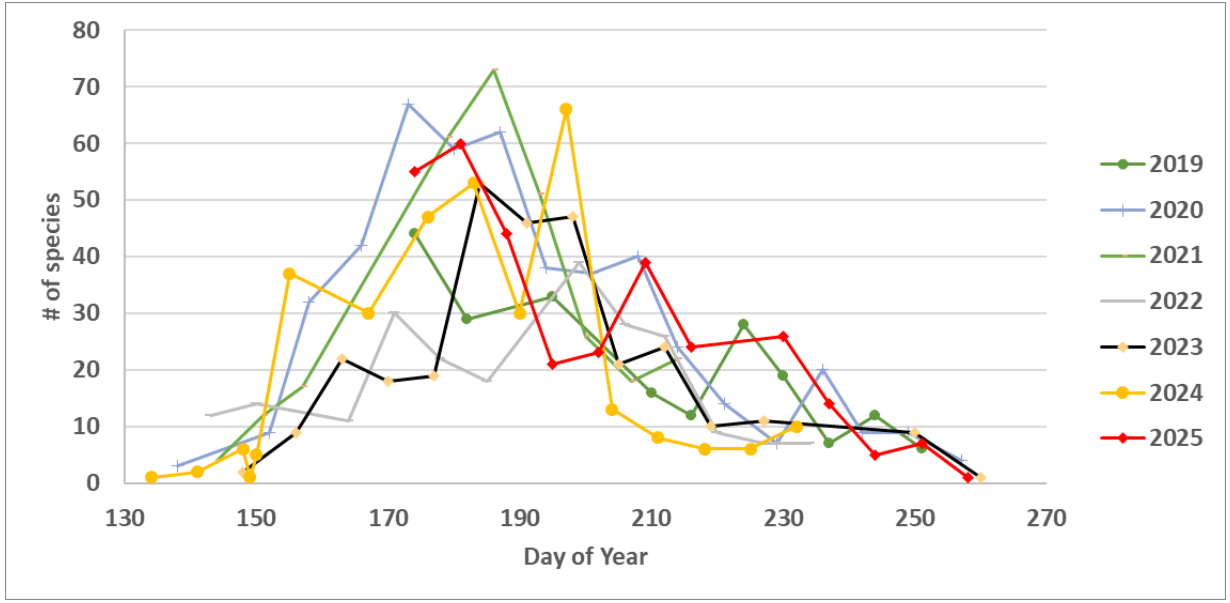
V. uliginosum

V. vitis-idaea

Biological Monitoring - Bonsai Botany

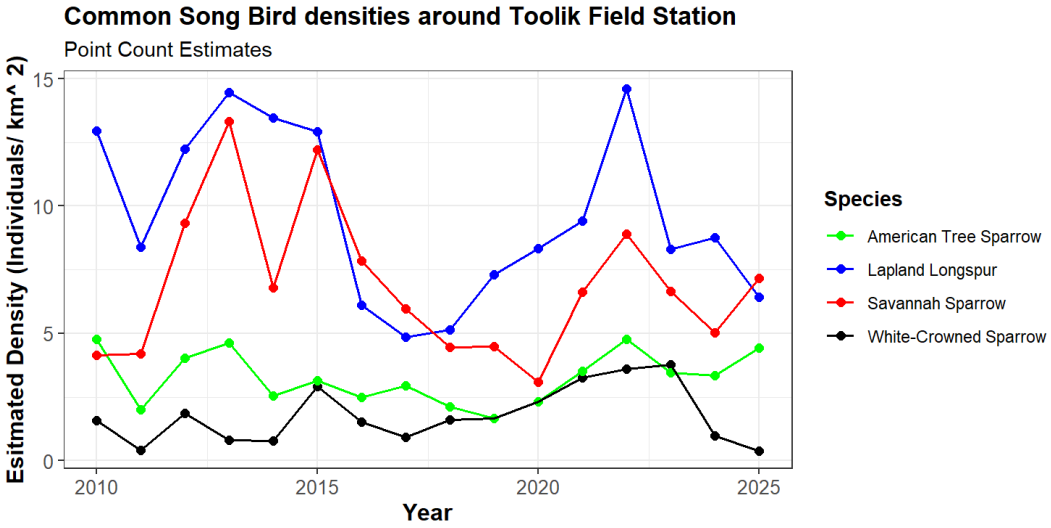


- Recorded plants in flower during each week
- Common names only so all can participate

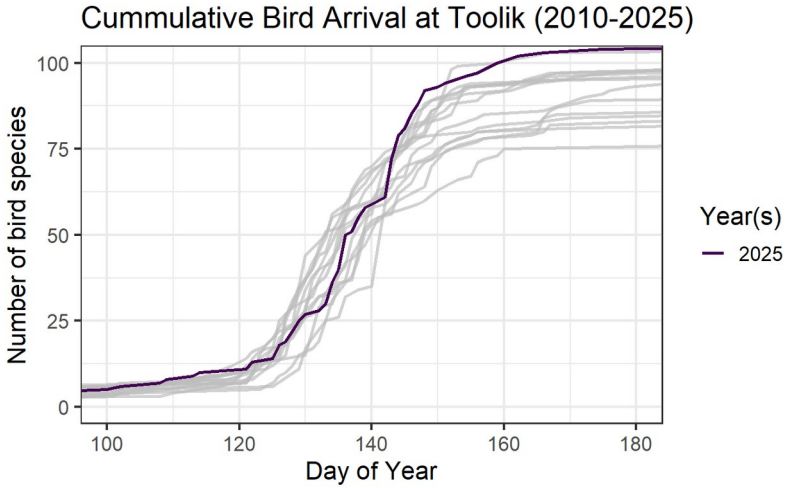


Biological Monitoring - Avian

- Avian point counts



- Date of arrival of bird species from the Naturalist Journal

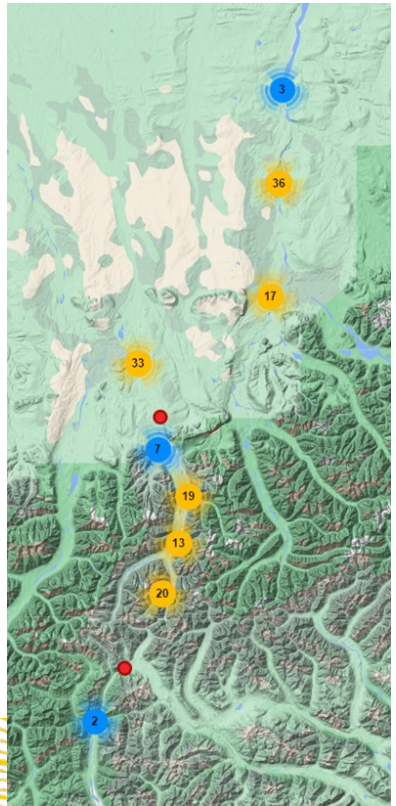


Biological Monitoring - Audio Recordings

- 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

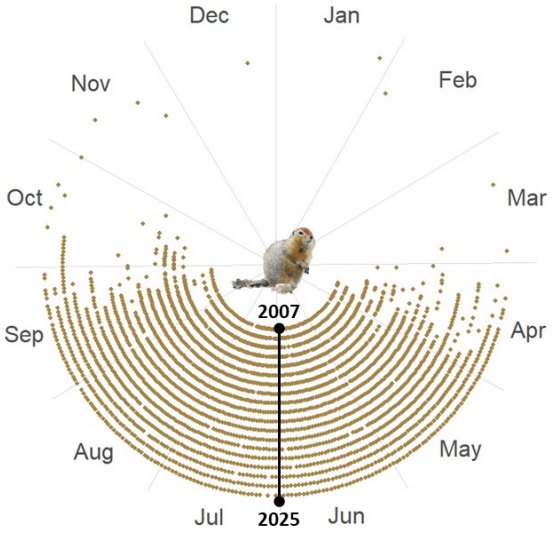
Northern waterthrush, June 2022

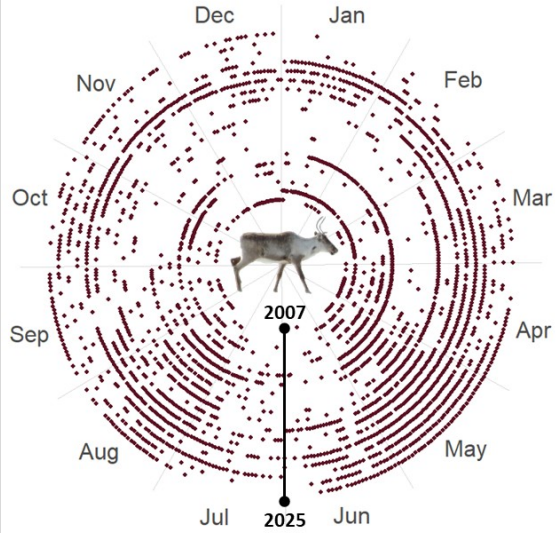
Surfbird (Mt Dalton), June 2022

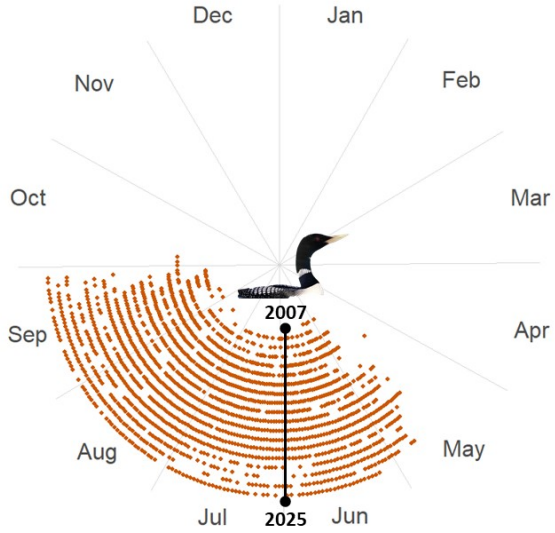


Biological Monitoring - Animal Observations

- Daily observations from the Naturalist Journal showing observed presence on the landscape.
  - Each ring is a year and each dot is a daily observation.





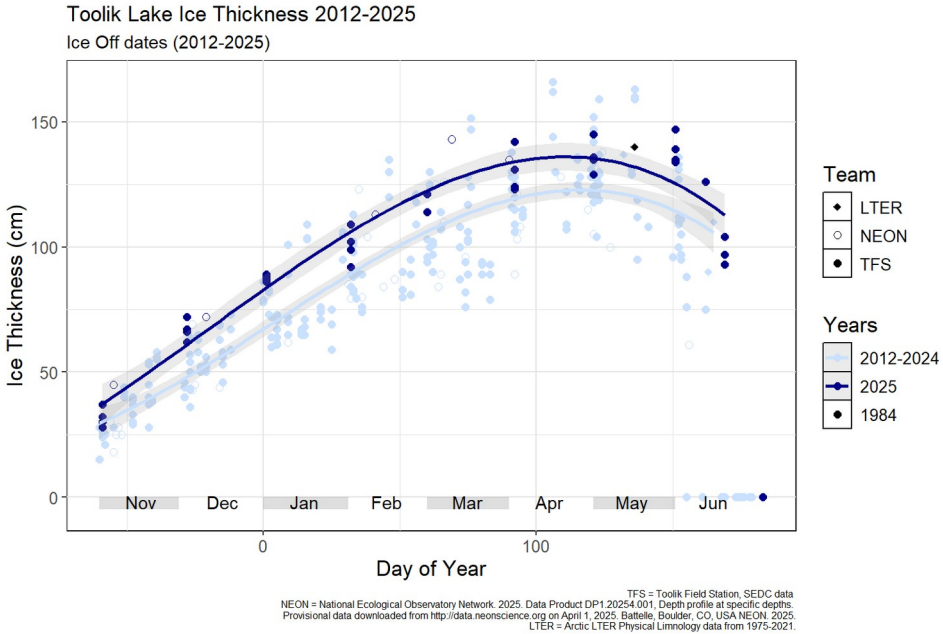


[Interactive Animals & Birds Tool]

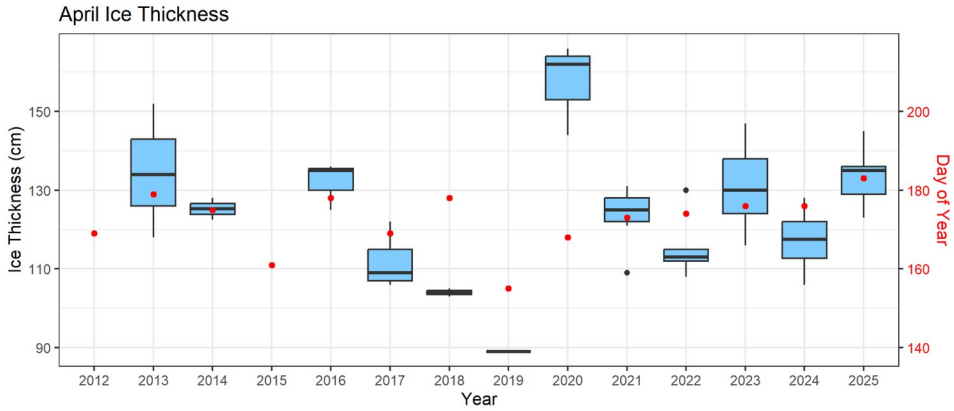
Baseline Monitoring
Abiotic

Abiotic Measurements - Ice Thickness

- Ice thickness - measured monthly
- Peak ice thickness, measured in April

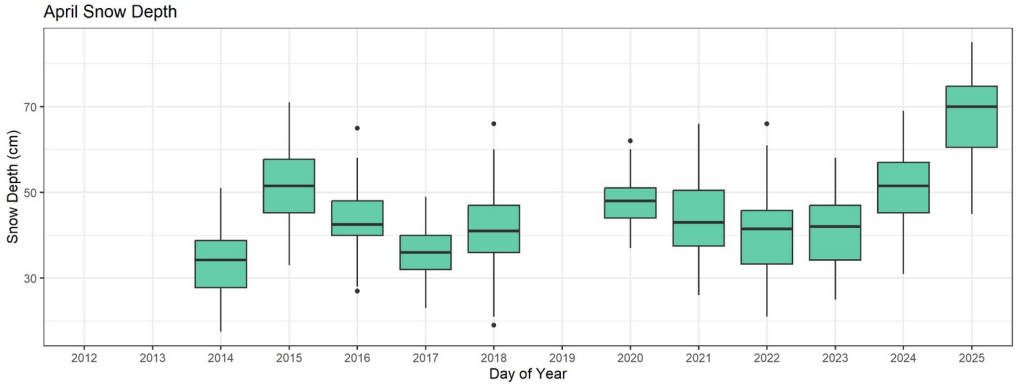


TFS = Toolik Field Station, SEDC data
NEON = National Ecological Observatory Network. 2025. Data Product DP1.20254.001, Depth profile at specific depths. Provisional data downloaded from http://data.neonscience.org on April 1, 2025. Battelle, Boulder, CO, USA NEON. 2025.
LTER = Arctic LTER Physical Limnology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



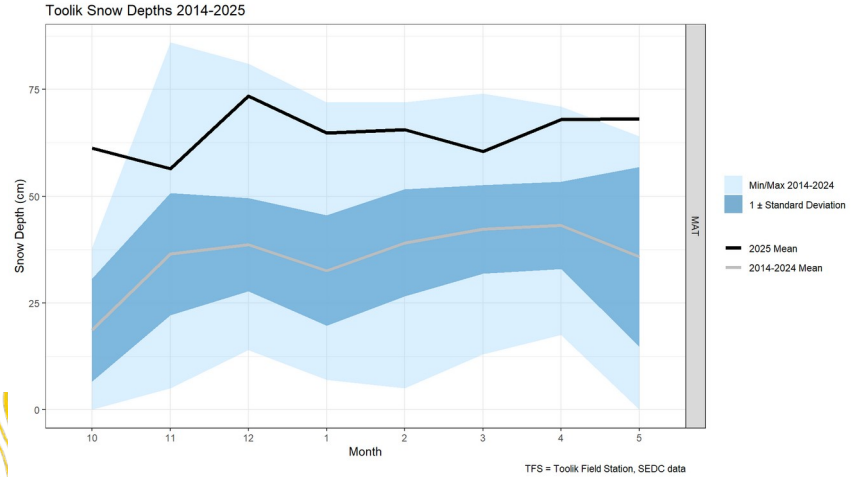
Red dots are dates of ice off (secondary y-axis)

Abiotic Monitoring - April Snow Depth



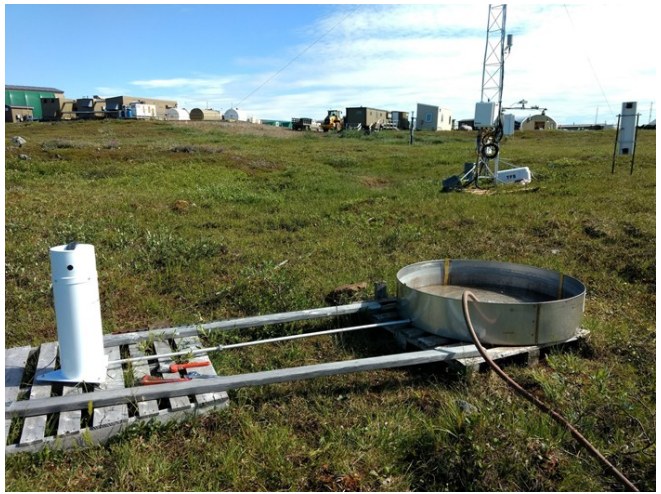
- April snow depth in 2025 deeper on average than prior decade.

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



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
- 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

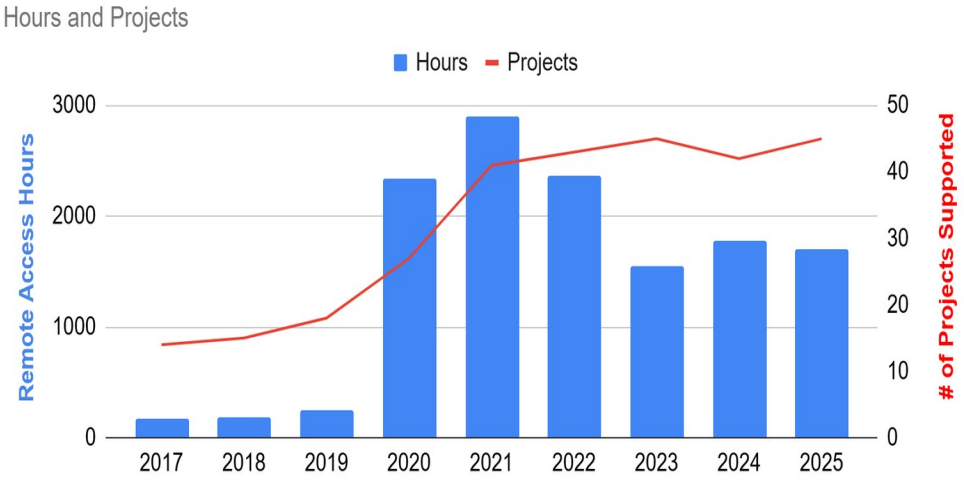
Remote Access

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 troubleshooti
- Phenology and NDVI measurements
- River discharge and water chem processing
- Soil sampling
- Tussock tiller measurements



*Not all projects supported have hours recorded

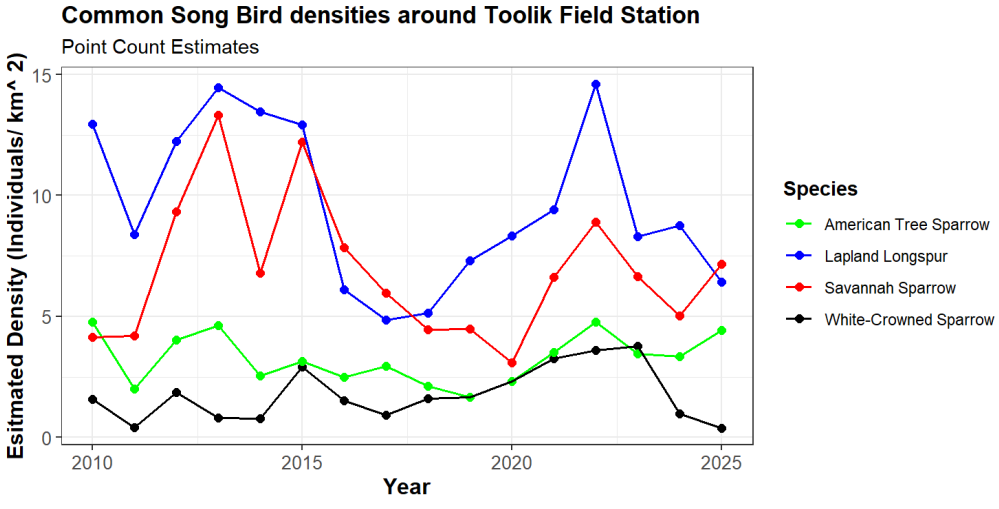
Winter Remote Access

- 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
uaf-iab-toolik-edc@alaska.edu

Baseline Datasets



Remote Access and Field Support