



## **Division of Environmental Biology Virtual Office Hour**

### *NSF Funding for NEON-Enabled Science*

*Please submit questions via the Q&A button available to you on Zoom.  
Please set to "Send anonymously"*

# Welcome!

## Division of Environmental Biology

### NSF staff in attendance today:

- Jeremy Wojdak (host) – Population and Community Ecology
- Chris Balakrishnan – Systematics and Biodiversity Science
- Matt Kane – Ecosystem Science; Macrosystems Biology & NEON-Enabled Science
- Mike Binford – Macrosystems Biology & NEON-Enabled Science, and NEON Program (DBI)

**Facilitators** – Christina Washington, and Bill Lawson



# DEB Virtual Office Hour

**DEB Office Hours: second Monday of each month, 1-2pm Eastern**

## Upcoming Topics:

- |              |   |
|--------------|---|
| October 16*: | Welcome to DEB  |
| November 13: | Partnership to Advance Conservation Science and Practice (PACSP) Update           |
| December 11: | Introduction to the Directorate for Technology, Innovation and Partnerships (TIP) |

\*indicates date change





# DEB Blog posts upcoming topics, registration, and recap posts

<https://debblog.nsfbio.com/office-hours/>

## DEBrief

Blog of the Division of Environmental Biology, NSF

[Home](#) [DEB Resources and Links](#) [Office Hours](#) [About](#) [Blog Policies](#)



### Office Hours

Join us the **second Monday of each month from 1pm-2pm Eastern Time** for the Division of Environmental Biology's (DEB) Virtual Office Hours. Representatives from each of the four clusters will be available to discuss specific programs and funding opportunities. There will then be an open question and answer period – questions can be on any NSF or DEB topic.

Join us remotely and bring your questions! Please use the registration link below to set up your



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[Home](#) [DEB Resources and Links](#) [Office Hours](#) [About](#) [Blog Policies](#)



AUGUST 21, 2023 BY DEB SCIENCE STAFF

### 8/14/23 Virtual Office Hours Recap: Things I wish I learned earlier about NSF

The Division of Environmental Biology (DEB) held its latest Virtual Office Hour on August 14, 2023. Program Officers discussed things they've learned during the transition from Principal Investigator to NSF Program Officer, helpful tips and tricks when applying for NSF funding, common misconceptions about the Merit Review Process, and more. We host these office hours 1-2pm EST on the 2nd Monday of every month. There is a designated theme each time, but attendees are welcome to ask about other NSF-related topics. Program Officers (POs) from different research areas are present at each Virtual Office Hour, so a wide range of scientific perspectives are represented.

The presentation slides, recording, and other documents are available here:

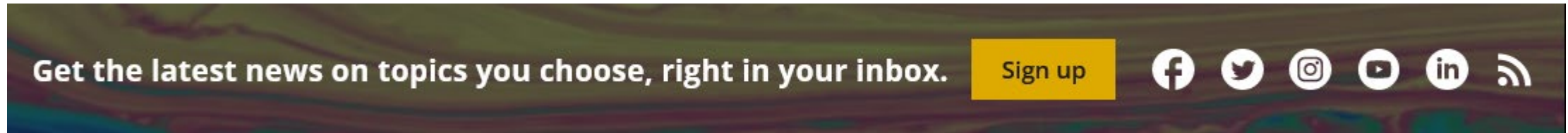


Search ...



# BIO News and Updates

Visit [www.nsf.gov](http://www.nsf.gov) and scroll down until you see the Sign up and social media banner, click on the yellow box, and follow the prompts.



**Volunteer to review:**

<https://www.surveymonkey.com/r/DEBexpertise>



# Recent and Upcoming Funding Opportunities

Find links to all recent solicitations and DCL at the left side of the BIO webpage under Funding

**Remember** – Many BIO solicitations have no deadlines and no submission limits.

- NSF 23-549 – Division of Environmental Biology Core Programs - **No deadline**
- NSF 22-591 – Opportunities for Promoting Understanding through Synthesis (OPUS) – **No deadline**
- NSF 22-504 – Macrosystems Biology & NEON-Enabled Science (MSB-NES) – **Deadline Nov 13**
- NSF 20-579 – Dynamics of Integrated Socio-Environmental Systems (DISES) – **Deadline Nov 15**
- NSF 22-513 – Organismal Response to Climate Change (ORCC) – **Deadline Nov 21**
- DCL 23-055 – Bioinspired Design Collaborations to Accelerate the Discovery-Translation Process (BioDesign)
- DCL 23-092 – Dear Colleague Letter: Availability of Earth Observation Data for NSF-Funded Researchers
- [BIO 18-001](#) – Biological Sciences Temporary/Rotator Program Officer



# DEB Core Program Solicitation

## NSF 23-549

- **PAPPG new requirement starting October 23, 2023:** PIs and other senior personnel are **required** to use the SciENCv format **only** for preparation of the Biographical Sketch and Current and Pending support
- **DEB Core Program Solicitation update: Safe and Inclusive Work Environments** for off-site research statement **required** upon submission\*\*\*\*

Check out the DEB Blog for more information



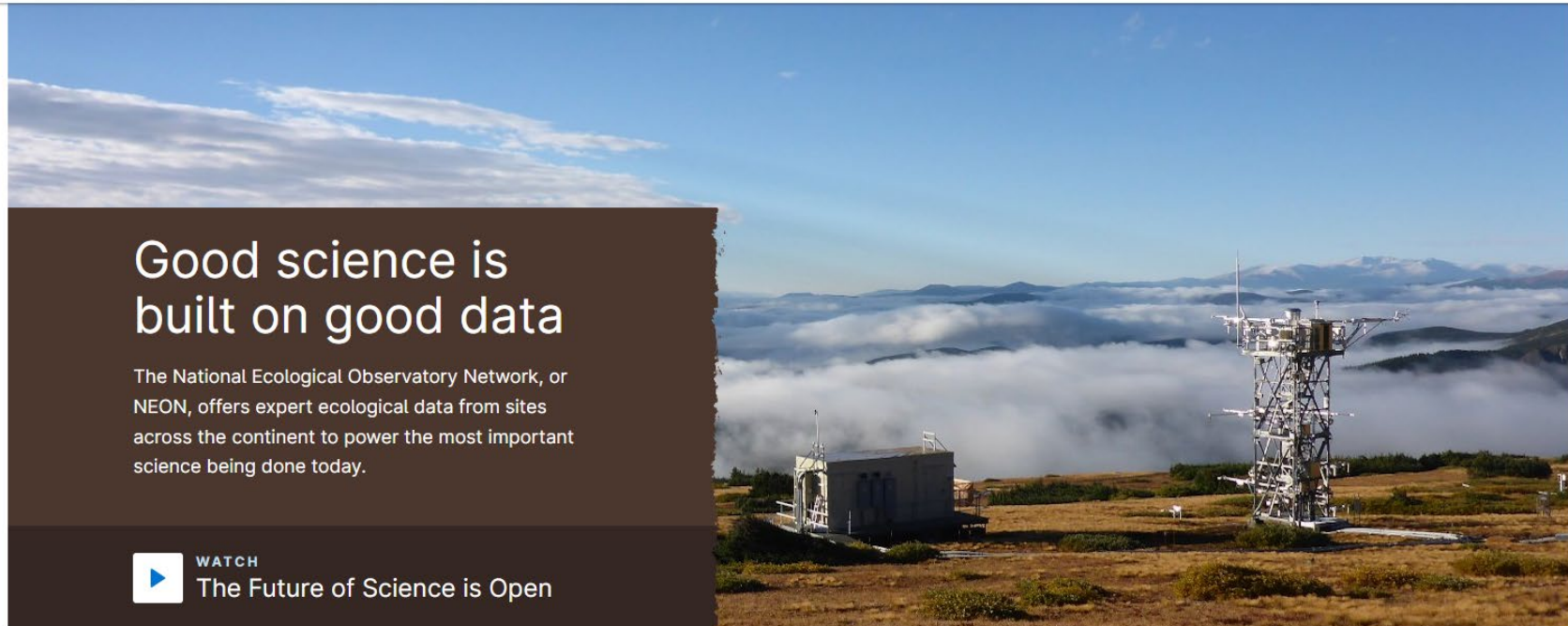


# What is NEON?

<https://www.neonscience.org/>




[About Us](#) [Data & Samples](#) [Field Sites](#) [Impact](#) [Resources](#) [Get Involved](#) 



## Good science is built on good data

The National Ecological Observatory Network, or NEON, offers expert ecological data from sites across the continent to power the most important science being done today.

 **WATCH**  
The Future of Science is Open



### By ecologists. For everyone.

NEON is a network of field research sites, designed by ecologists to provide open data for all. Discover how we learn and grow.

[LEARN MORE >](#)



### 81 field sites across the U.S.

To uniquely support 30+ years of site-level and continental-scale research, NEON locates sites across the U.S. to capture variability in ecological and climatological conditions.

[EXPLORE FIELD SITES >](#)





# NEON Concept

NEON's primary purpose is to provide:

- Continental-scale environmental data and archival samples
- Infrastructure for ecological research studies
- Educational tools to work with large data

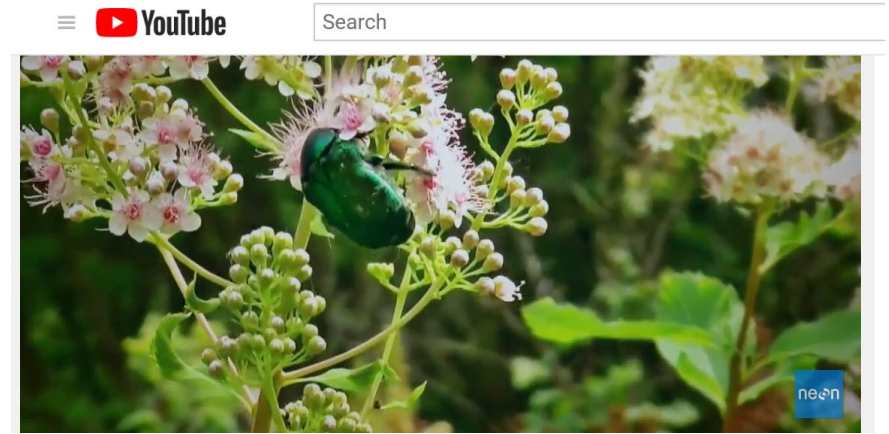
## Grand Challenges

### Causes of Change

Climate Change  
Land-Use Change  
Invasive Species

### Responses to Change:

Biodiversity  
Biogeochemistry  
Ecohydrology  
Infectious Disease



NEON Open Data to Understand our Changing Ecosystems



# NSF Funding for NEON-Enabled Science - BIO

- Division of Environmental Biology (DEB):
  - Macrosystems Biology & NEON-Enabled Science (MSB-NES)
  - Population and Community Ecology (PCE)
  - Ecosystem Science (ES)
- Division of Biological Infrastructure (DBI)
- Division of Integrative and Organismal Systems (IOS)



# NSF Funding for NEON-Enabled Science - Other

- GEO: Division of Atmospheric Science (ATM)
- GEO: Division of Earth Sciences (EAR)
- GEO: Office of Polar Programs (OPP)
- ENG: Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET)



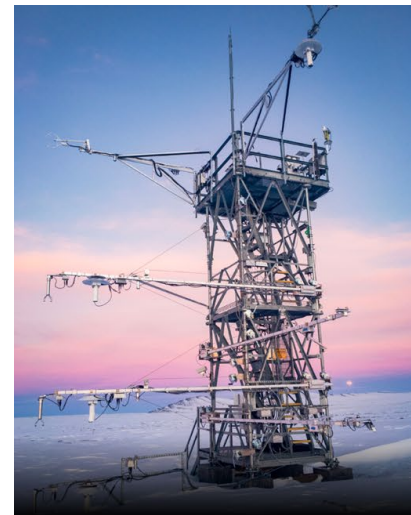


# NEON Sites

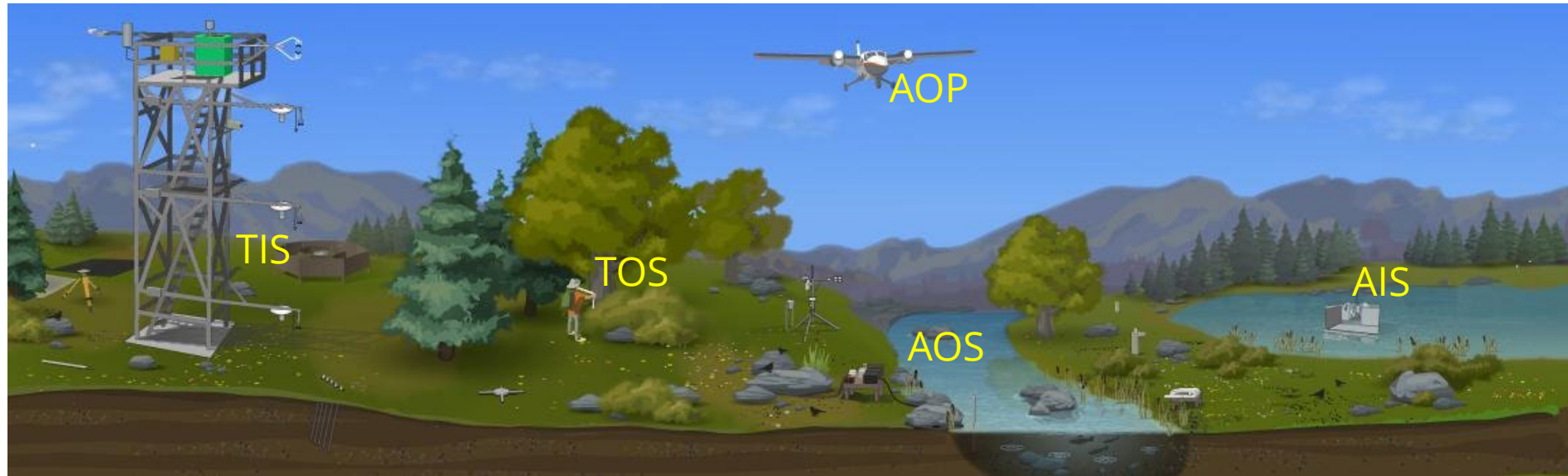
## Aquatic



## Terrestrial



# NEON Field Sites Concept

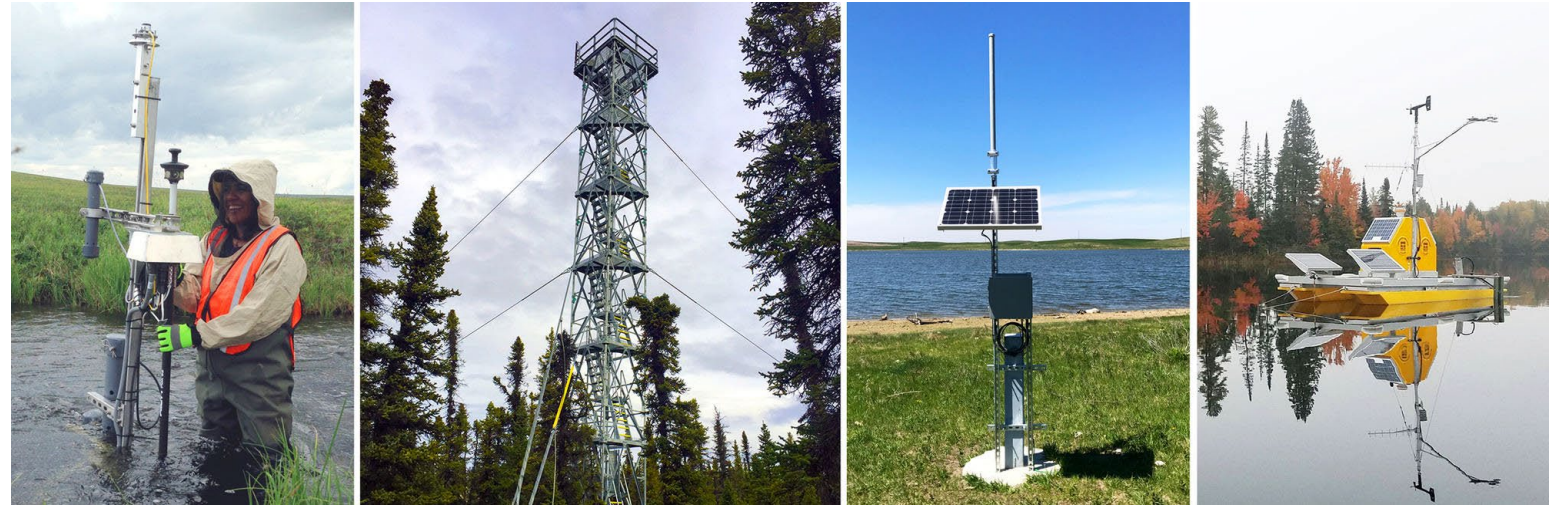


- Terrestrial Instrument Systems (TIS)
- Terrestrial Observational Systems (TOS)
- Aquatic Instrument Systems (AIS)
- Aquatic Observational Systems (AOS)
- Airborne Observatory Platform (AOP)



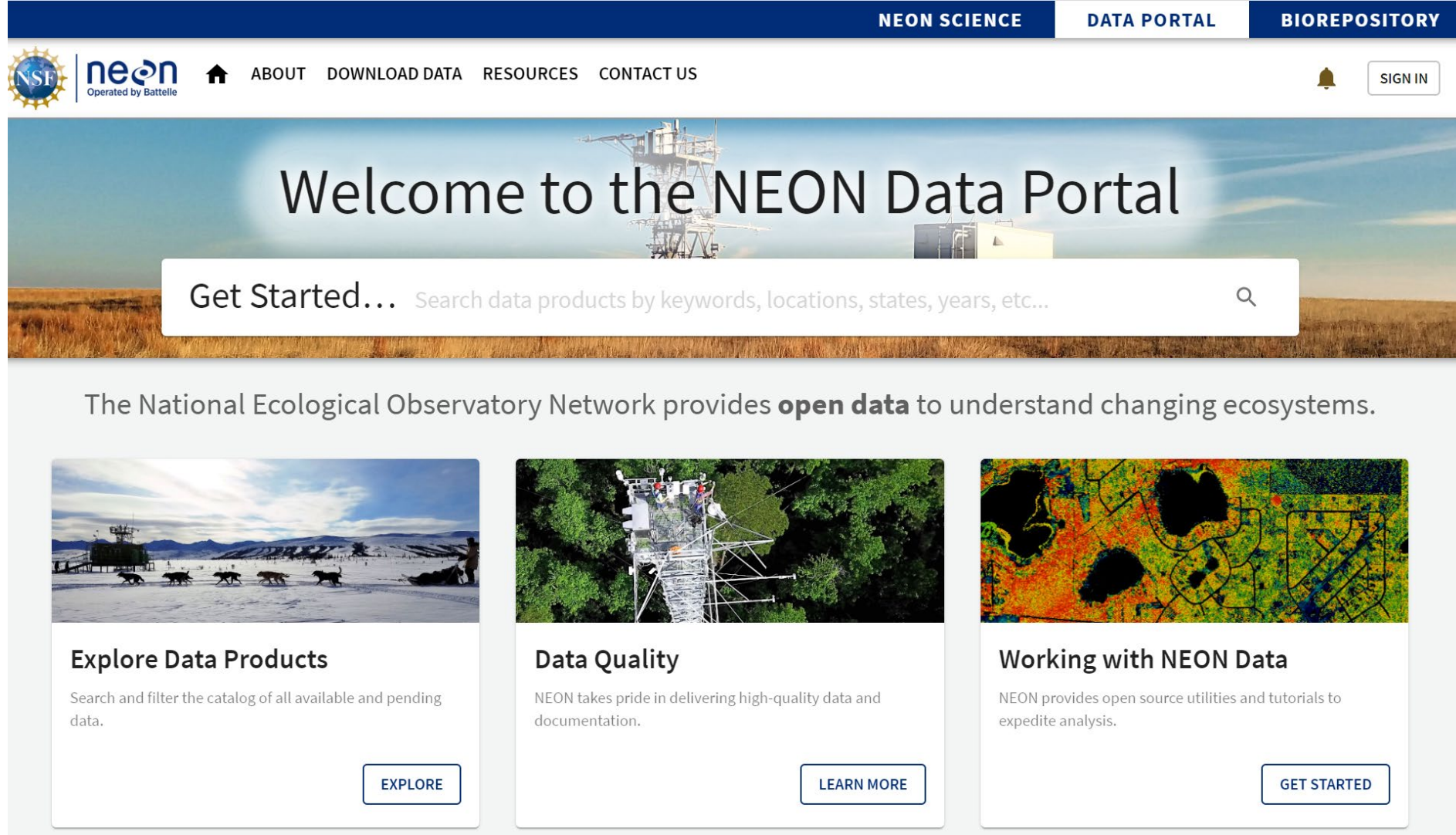
# Data Collection

Up to 182 Different Data Products.





# Data and Data Portal



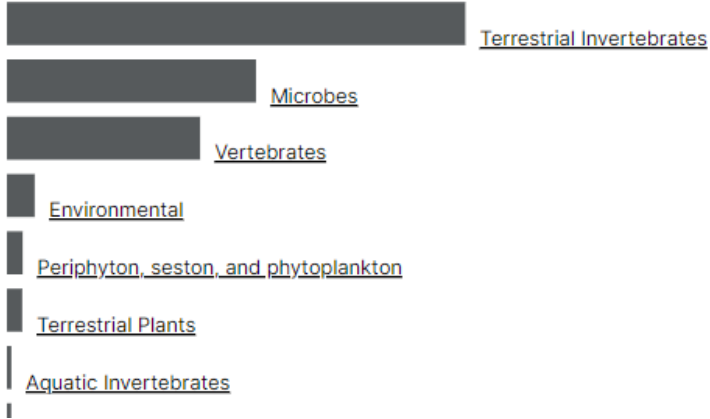
The screenshot shows the NEON Data Portal homepage. At the top, there is a dark blue navigation bar with the text "NEON SCIENCE", "DATA PORTAL", and "BIOREPOSITORY". Below this is a white header area containing the NSF and NEON logos, a home icon, and navigation links: "ABOUT", "DOWNLOAD DATA", "RESOURCES", and "CONTACT US". On the right side of the header, there is a notification bell icon and a "SIGN IN" button. The main content area features a large banner image of a field with a tower in the background. The banner text reads "Welcome to the NEON Data Portal" and "Get Started... Search data products by keywords, locations, states, years, etc...". Below the banner, a paragraph states: "The National Ecological Observatory Network provides **open data** to understand changing ecosystems." There are three main content cards: 1. "Explore Data Products" with a subtext "Search and filter the catalog of all available and pending data." and an "EXPLORE" button. 2. "Data Quality" with a subtext "NEON takes pride in delivering high-quality data and documentation." and a "LEARN MORE" button. 3. "Working with NEON Data" with a subtext "NEON provides open source utilities and tutorials to expedite analysis." and a "GET STARTED" button.



# Biorepository

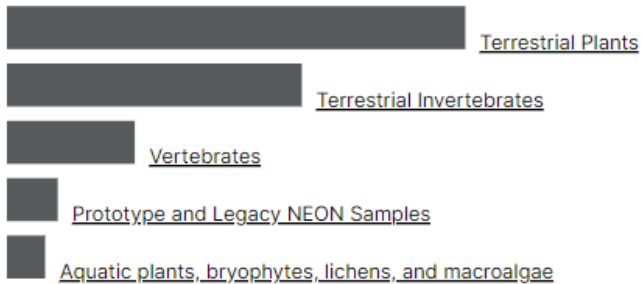
> 415,000 samples

Distribution of samples by collection type:

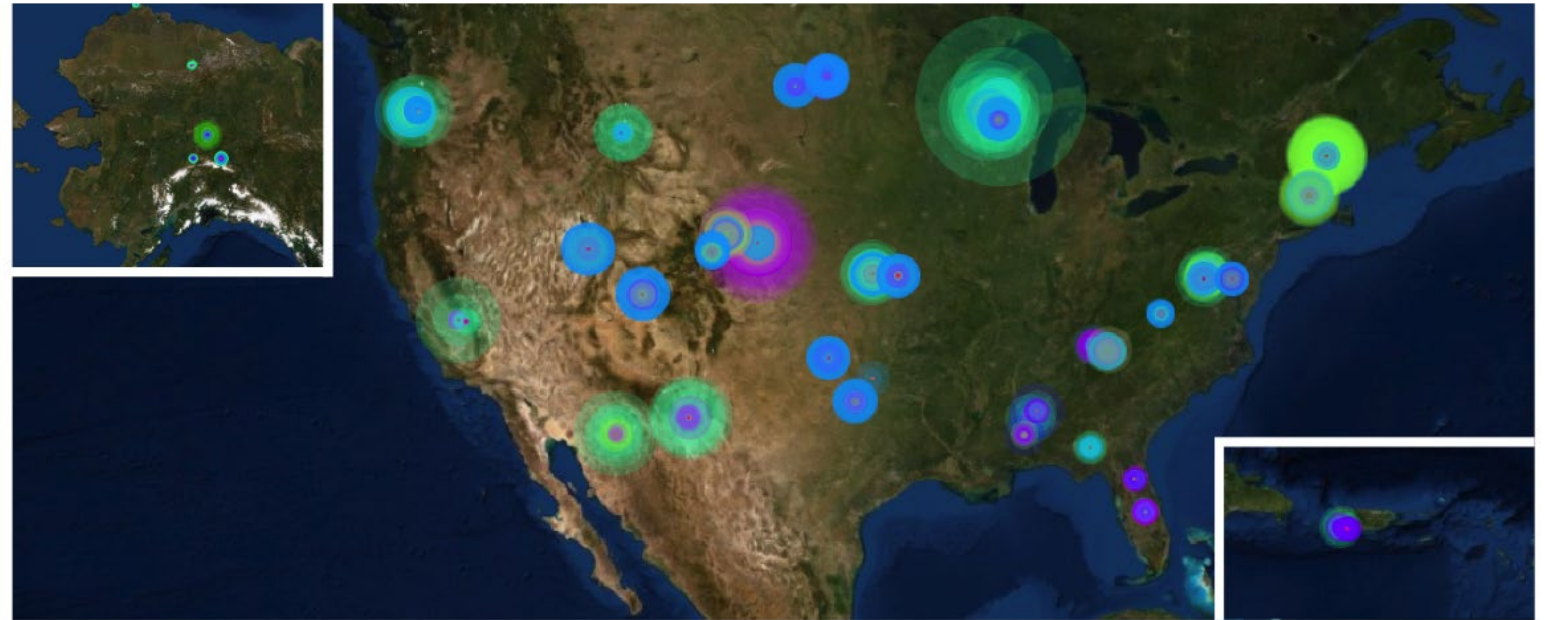


> 3,400 taxa

Distribution of samples by top 5 determined taxa:



## Discover and access sample-based data



Samples available in the portal (Aug 2019), collected in Alaska (top left), Continental US (center), and Puerto Rico (bottom right). Colors indicate different collection types. Circle sizes indicate quantity of samples per collection in a given locality.





# Assignable Assets

- Mobile Deployment Platforms
- Airborne Observation Platform Surveys
- Access to Sensor Infrastructure at Field Sites
- Access to Observational Sampling Infrastructure at Field Sites, Including Field Technicians
- Procedures for Proposals Concerned with NEON
  - Pre-proposal
  - Award considerations
  - Research conduct during project



## Resources

[Getting Started with NEON Data & Resources](#)

[Documents and Communication Resources](#)

[Code Hub](#)

[Learning Hub](#)

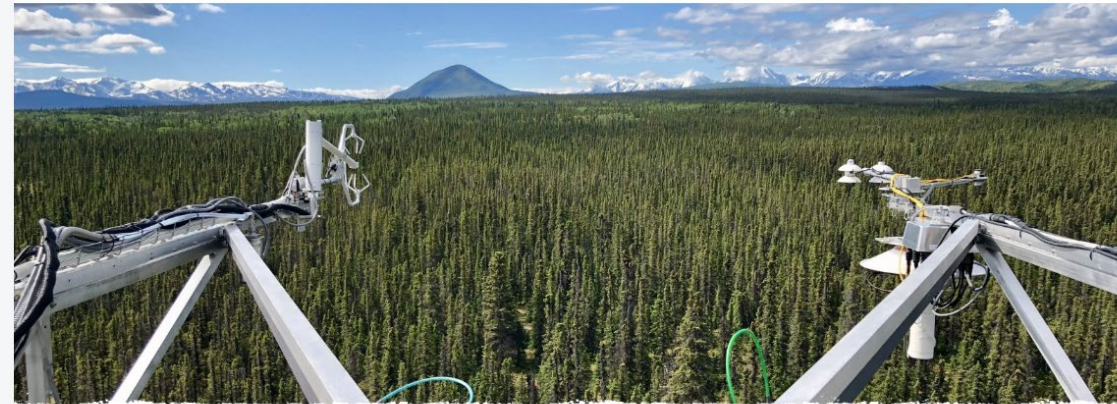
[Research Support and Assignable Assets](#)

[Funding Opportunities](#)

### JUMP TO:

- [Submitting Your Request](#)
- [Submission Timelines](#)
- [Submission Resources](#)
- [FAQs](#)
- [Have Additional Assignable Asset Questions?](#)

## Research Support and Assignable Assets



### NEON Assignable Assets Program

The NEON Assignable Assets Program makes available certain components of NEON's infrastructure to members of the community to support their own research or other activities.

NEON serves as an accessible research platform for Principal Investigator-driven research and environmental studies. Research support includes access to NEON infrastructure, site coordination, labor pool of field ecologists, engineering, and science staff. These services are mainly cost recoverable and dependent on availability of resources. Learn about the different components of the NEON Assignable Assets Program, the types of NEON research support services, and infrastructure you can access below.

[ASSIGNABLE ASSETS FAQs >](#)





# Mobile Deployment Platforms

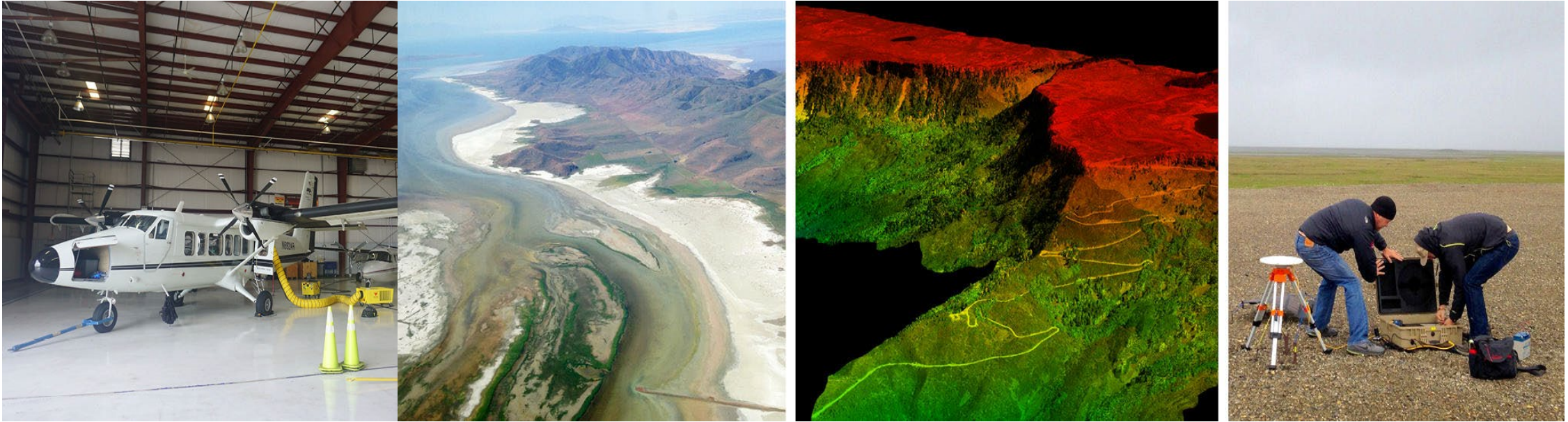


## **Mobile Deployment Platforms (MDPs):**

- Self-contained mobile sensor arrays
  - meteorological, soil and surface water
    - short- to medium-term monitoring
  - rapid deployment
  - capture stochastic ecological events (e.g., fires, flood events, pest outbreaks)



# Airborne Observation Platform Surveys



## Airborne Observation Platform (AOP) Surveys:

- Light aircraft with
  - high-fidelity hyperspectral imaging spectrometer
  - discrete and waveform LiDAR
  - high-resolution digital camera
- **Researchers can request** to fly non-NEON or NEON sites times of year when NEON does not collect AOP data.



# Access to Sensor Infrastructure at Field Sites



NEON.D03.OSBS.DP1.00033 - NetCam SC IR - Thu Apr 11 2019 19:30:06 UTC  
Camera Temperature: 49.5  
Exposure: 85



## Access to Sensor Infrastructure (SI) at Field Sites:

- Investigators may request to add sensors to existing NEON field site infrastructure to collect their own data.
- Terrestrial (towers and soil arrays), aquatic site (in-situ sensors, groundwater wells, riparian met stations)





# Access to Observational Sampling, Including Field Technicians at Field Sites



- **Access to Observational Sampling Infrastructure (OSI) at Field sites:**
- Access to sampling locations or field technician support for PI-led projects at NEON sites
- Access to excess biological samples collected but not archived as part of the NEON Biorepository.



# Procedures for Assignable Assets (AA) Proposals Involving NEON

- Pre-proposal
  - PIs who want to use AA **must work with NEON** to develop proposal budget
  - Some programs have **requirement for a letter of support** from NEON for AA use.
- Award considerations
  - **PAPPG** specifies how AA costs are paid
  - NEON employees can be **PI, Subaward PI, Award Co-PI, Contractor, Consultant**
  - NEON **does not disclose F&A charges** to PI, but does to NSF
  - Some programs require a **letter of commitment** that states that the AA is available in the time frame requested.
- Project conduct
  - If a project uses NEON data from the Data Catalog, then no special issues.
  - Access to sites: NEON **facilitates** access with site owners or conducts any sampling itself.
  - PIs must **work with NEON** so that no NEON data products are jeopardized (e.g., no additional sampling on NEON plots; no interference with TIS or AIS instruments)



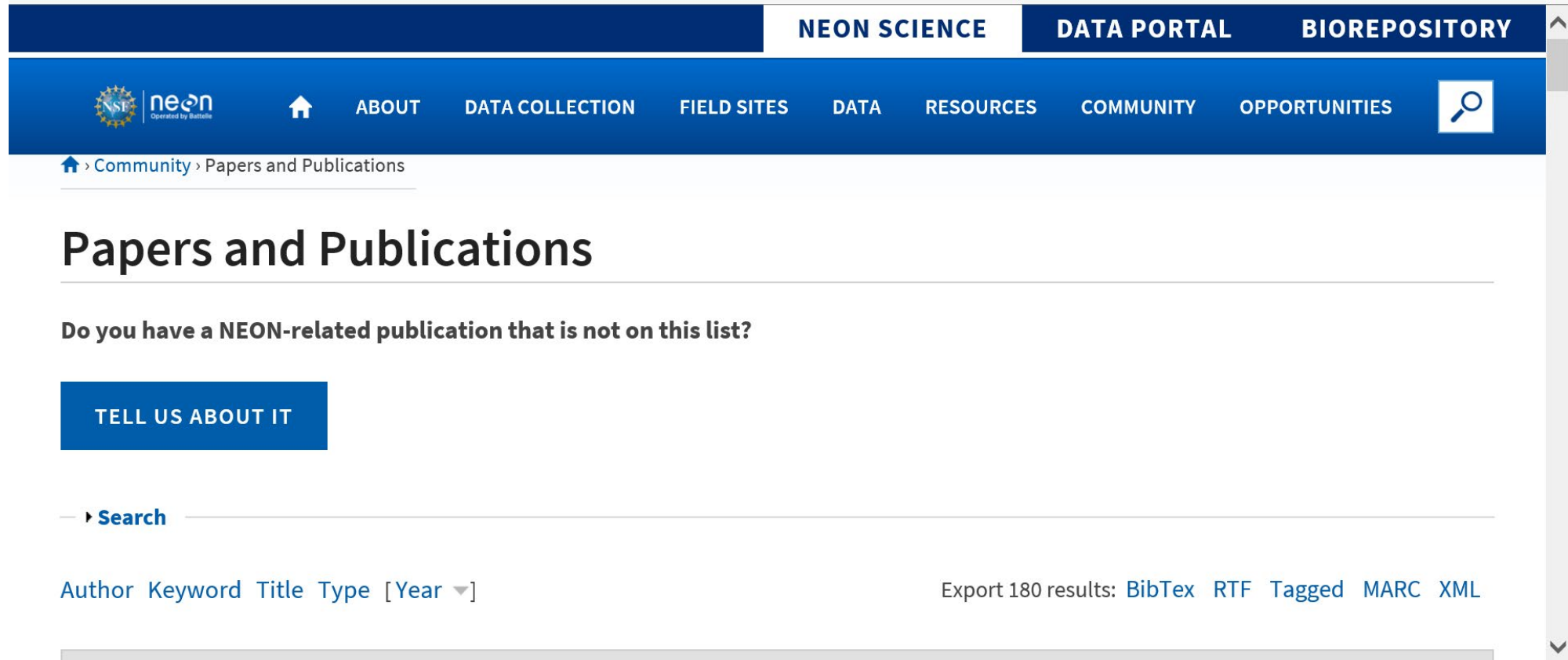


# Questions?

- **Submit your questions via the Q&A box on your screen and set to “Send anonymously”**
- Upvote questions by clicking the thumbs up icon next to the question you most want answered



# To See NEON-Related Publications



The screenshot shows the NEON Science website's 'Papers and Publications' page. The top navigation bar includes 'NEON SCIENCE', 'DATA PORTAL', and 'BIOREPOSITORY'. Below this is a secondary navigation bar with 'neon' logo, 'ABOUT', 'DATA COLLECTION', 'FIELD SITES', 'DATA', 'RESOURCES', 'COMMUNITY', 'OPPORTUNITIES', and a search icon. The breadcrumb trail reads 'Community > Papers and Publications'. The main heading is 'Papers and Publications'. A call to action asks 'Do you have a NEON-related publication that is not on this list?' with a 'TELL US ABOUT IT' button. A search bar is present with a 'Search' button. Below the search bar, there are sorting options: 'Author', 'Keyword', 'Title', 'Type', and '[Year ▼]'. On the right, it says 'Export 180 results: BibTex RTF Tagged MARC XML'. The page is partially obscured by a vertical scrollbar on the right.

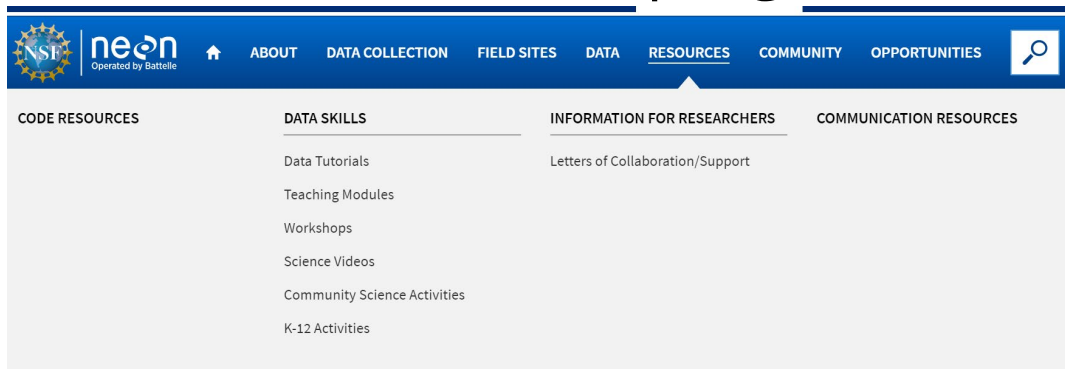
<https://www.neonscience.org/community/papers-publications>





# Educational and Training Opportunities

- Several NSF Awards to Support Educational Programs
- Online tutorials
- Pre-written data access code in a Utilities Package (R, Python)
- Visits to institutions by NEON Staff
- Workshops during society conferences
- Postdoctoral researcher program



Home » Resources » Data Skills » Data Tutorials

## Data Tutorials

Looking to improve your data skills using tools like R or Python? Want to learn more about working with a specific NEON data product? NEON develops online tutorials to help you improve your research. These self-paced tutorials are designed for you to use as standalone help on a single topic or as a series to learn new techniques.

Code for all script based tutorials can be downloaded at the end of the tutorial. Original files can also be found on [GitHub](#).

All material are freely available for you to use and reuse. We suggest the following citation:

[AUTHOR(S)]. Data Tutorial:[TUTORIAL NAME]. Accessed:[DATE OF ACCESS]. National Ecological Observatory Network, Battelle, Boulder, CO, USA. [URL]

 [View Upcoming Events](#)

[FULL LIST OF EVENTS](#)

Featured

### Download and Explore NEON Data

1 - 2 HOURS

Tutorial for downloading data from the Data Portal and the neonUtilities package, then exploring and understanding the downloaded data

[READ MORE >](#)

FILTER

[ALL](#)

TYPE

Topic

LANGUAGE / TOOL

### Select pixels and compare spectral signatures in R

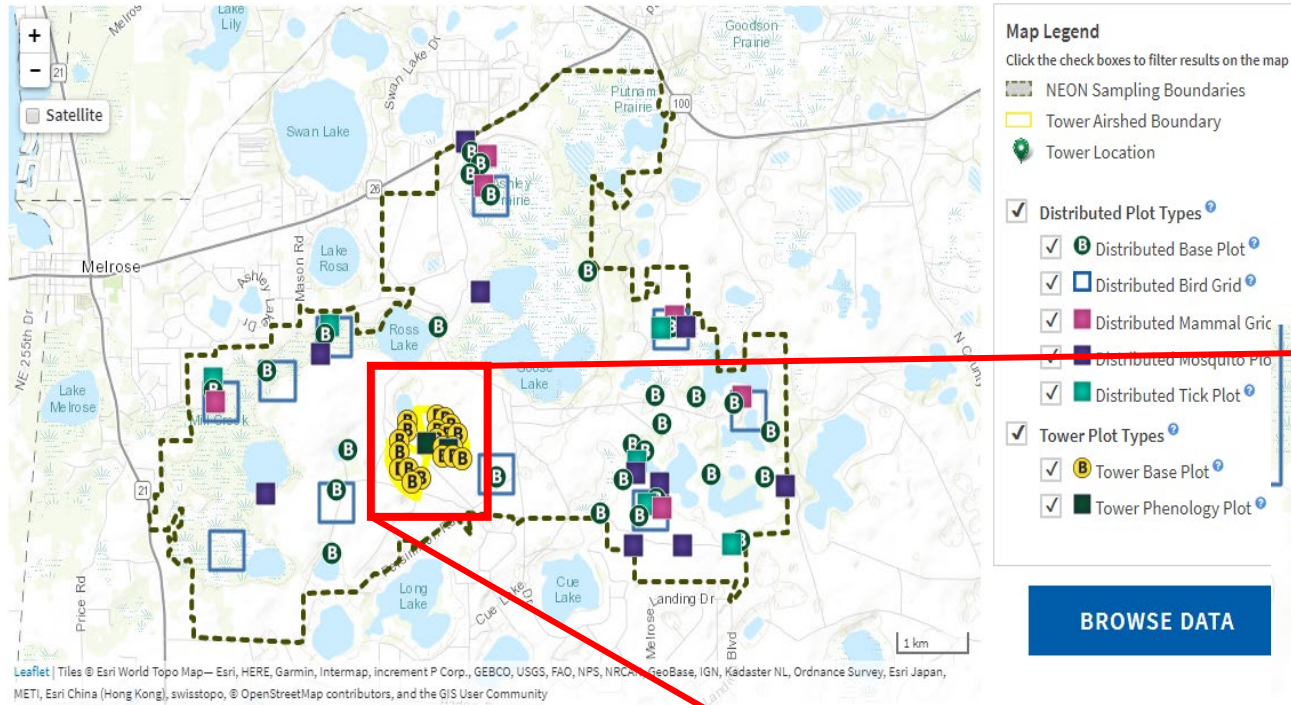
0.5 HOURS

Plot and compare the spectral signatures of multiple different land cover types using an



# NEON Systems at Sites

Core Terrestrial | Florida | D03: Southeast



Leaflet | Tiles © Esri World Topo Map— Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

This map depicts the spatial layout of this field site. Please note that some locations may have moved over time due to logistics, safety and science requirements. This map was updated on December 19, 2019

- Terrestrial Instrument Systems (TIS)
- Terrestrial Observational Systems (TOS)
- Aquatic Instrument Systems (AIS)
- Aquatic Observational Systems (AOS)
- Airborne Observatory Platform (AOP)

**Tower Base Plot (40m x 40m)**

Plot ID: OSBS\_026  
Latitude: 29.693584  
Longitude: -81.992057  
NLCD Class: Evergreen Forest

Possible Sampling Modules:  
Below Ground Biomass Coring , Biogeochemistry,  
Coarse Downed Wood, Canopy Foliage Chemistry ,  
Digital Hemispherical Photos for Leaf Area Index, Plant  
Diversity, Herbaceous Productivity, Litter and Fine  
Woody Debris, Soil Microbes, Vegetation Structure





# Data and Data Portal

**Filter**

[X RESET ALL FILTERS](#)

**Search**

Utah, "snow depth", 2022, etc...

Use several terms to match products having any term (*term OR term*). Quote terms to match phrases (e.g. "wind speed"). [Browse keywords](#) for ideas.

**Release** ⓘ

Latest and Provisional

Data in the latest release in addition to provisional data (not yet in any release)

182 data products

[RELEASE DETAILS ⓘ](#)

**Available Dates**

Show products that have any data available between two dates.

[FILTER ON AVAILABLE DATES...](#)

**Data Status**

Available (163)

Coming Soon (19)

**Visualizations**

Time Series Viewer (34)

AOP Data Viewer (9)

**Science Team** [X RESET](#)

Airborne Observation Platform (AOP) (29)

Aquatic Instrument System (AIS) (22)

Aquatic Observation System (AOS) (37)

Terrestrial Instrument System (TIS) (53)

Terrestrial Observation System (TOS) (41)

[Home](#) / [Data & Samples](#) / [Data Portal](#) / Explore Data Products

## Explore Data Products

### All Products

182 products from 81 sites | Data available Jan 2012 – Aug 2023

Download Full Catalog: [CSV](#) | [JSON](#) | [PDF](#)

### Filtered Products

41 products from 79 sites | Data available Jun 2012 – Jul 2023

Download Filtered Catalog: [CSV](#) | [JSON](#) | [PDF](#)

### Sort

\*Available\* data products will always show above "Coming Soon" data products, except when sorting by search relevance.

by Product Name



Showing first 10 of 41 filtered products

### Breeding landbird point counts

[DOWNLOAD DATA](#)

DP1.10003.001

[PRODUCT DETAILS](#)

Count, distance from observer, and taxonomic identification of breeding landbirds observed during point counts

#### Available Dates

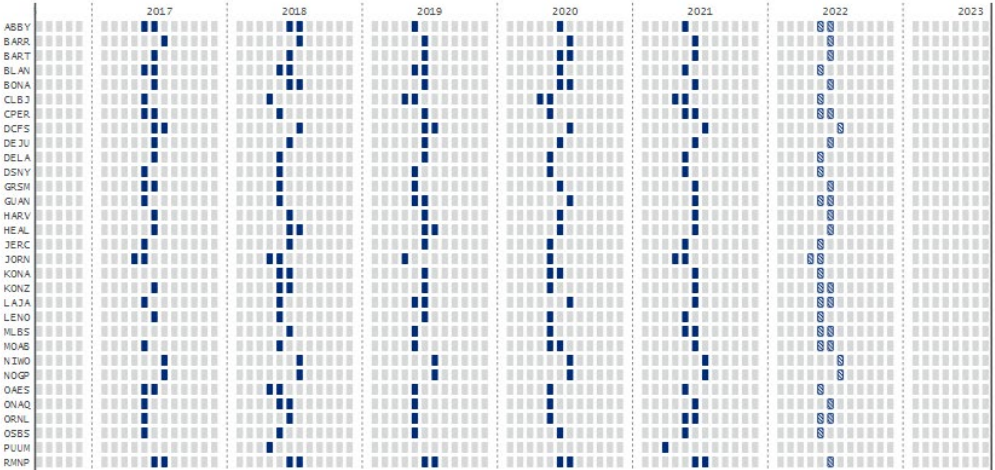
2013-06 through 2022-07

#### Data Themes



Key:  Release Available  Not Available  Provisional  Mixed

View By: [SUMMARY](#) | [SITE](#) | [STATE](#) | [DOMAIN](#)



# Data Portal – API and R Code

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

NEON\_Utilities\_example.R × NEON\_Utilities\_example.R × trip.temp\$TAAT\_30min ×

Source on Sa Filter

```
1 # NEON Utilities
2 # start with clear environment
3 rm(list=ls())
4
5 # Install NEON Utilities
6
7 install.packages("neonutilities")
8
9 # Call the neonutilities package
10 library(neonutilities)
11
12 # Following the README file
13 # aspirated air temperature
14
15 trip.temp <- loadNEONData(
16   domainID = "D13",
17   siteID = "MOAB",
18   horizontalPosition = "000",
19   verticalPosition = "040",
20   startDateTime = "2018-05-01 00:00:00",
21   endDateTime = "2018-05-01 07:00:00",
22   variables = "tempTripleMean",
23 )
```

	domainID	siteID	horizontalPosition	verticalPosition	startDateTime	endDateTime	tempTripleMean	tempTrij
1	D13	MOAB	000	040	2018-05-01 00:00:00	2018-05-01 00:30:00	16.2576	
2	D13	MOAB	000	040	2018-05-01 00:30:00	2018-05-01 01:00:00	15.8307	
3	D13	MOAB	000	040	2018-05-01 01:00:00	2018-05-01 01:30:00	15.6029	
4	D13	MOAB	000	040	2018-05-01 01:30:00	2018-05-01 02:00:00	15.3222	
5	D13	MOAB	000	040	2018-05-01 02:00:00	2018-05-01 02:30:00	14.0285	
6	D13	MOAB	000	040	2018-05-01 02:30:00	2018-05-01 03:00:00	13.1689	
7	D13	MOAB	000	040	2018-05-01 03:00:00	2018-05-01 03:30:00	12.8480	
8	D13	MOAB	000	040	2018-05-01 03:30:00	2018-05-01 04:00:00	12.8871	
9	D13	MOAB	000	040	2018-05-01 04:00:00	2018-05-01 04:30:00	12.4834	
10	D13	MOAB	000	040	2018-05-01 04:30:00	2018-05-01 05:00:00	11.6836	
11	D13	MOAB	000	040	2018-05-01 05:00:00	2018-05-01 05:30:00	11.1600	
12	D13	MOAB	000	040	2018-05-01 05:30:00	2018-05-01 06:00:00	10.5126	
13	D13	MOAB	000	040	2018-05-01 06:00:00	2018-05-01 06:30:00	10.1483	
14	D13	MOAB	000	040	2018-05-01 06:30:00	2018-05-01 07:00:00	10.0948	

23:1 (Top Level)

"readme\_00003"  
"TAAT\_30min"





# Recent NSF Awards

- See <https://www.nsf.gov/awardsearch/simpleSearchResult?queryText=%22National+Ecological+Observatory+Network%22&ActiveAwards=true>.

