

Rommel C. Zulueta, Ph.D.
NEON Assignable Asset Program Lead

Samantha Kremidas
NEON Assignable Assets Program Analyst

Michael SanClements, Ph.D.
Research Initiatives Lead

Assignable Assets Program Team:

- Shalane Frost
- Samantha Kremidas
- Nick Marusich
- Cory Ritz
- Michael SanClements
- Matt Schroeder



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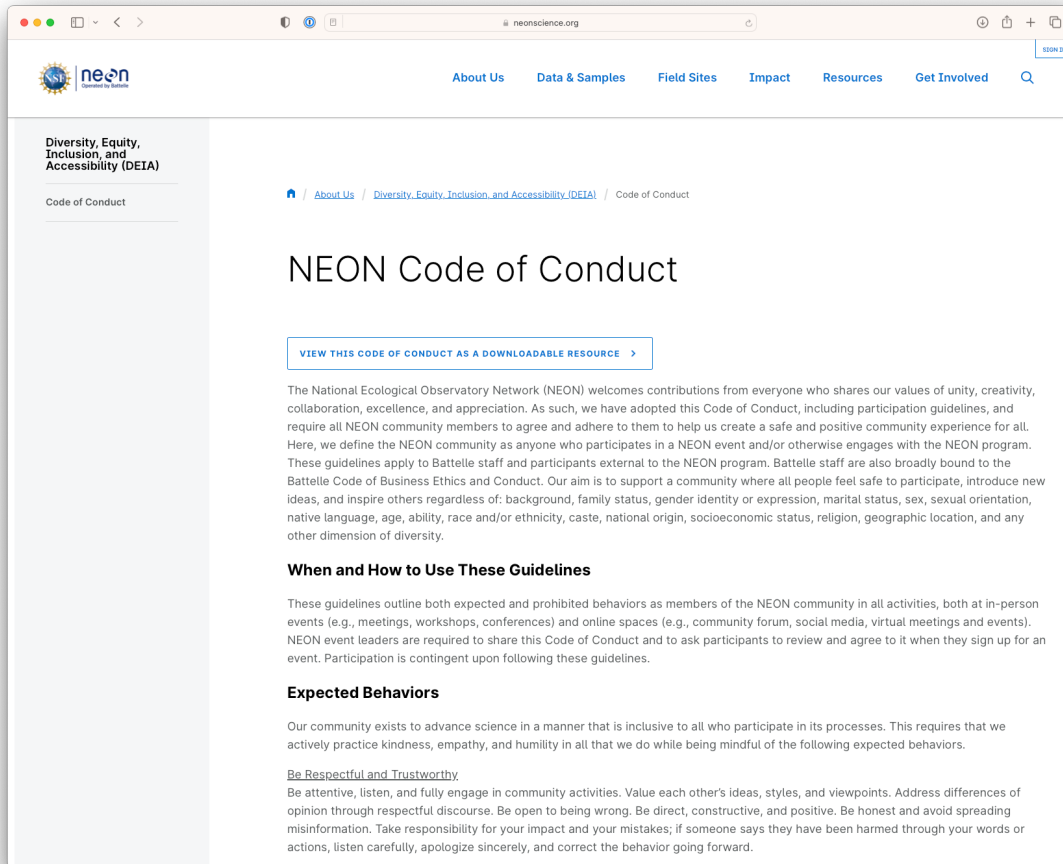
Webinar | September 13, 2023

NEON Assignable Assets Program



NEON Code of Conduct

www.neonscience.org/neon-code-conduct



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NEON Assignable Assets Program



Presentation Overview

- NEON Overview
- Assignable Assets Program Overview
- Assignable Assets Program Growth
- Requesting Research Support
- Request Process
- Example Projects
- Opportunities & Resources
- Q&A



National Ecological Observatory Network (NEON) Overview




www.neonscience.org

National Ecological Observatory Network (NEON)


- Continental-scale
 - Long-term
 - ~30 years
 - Fully NSF funded
 - Operated by Battelle
- BATTELLE***
- Standardized data collection methods
- Free and open data

www.neonscience.org

National Ecological Observatory Network

The National Science Foundation's National Ecological Observatory Network (NEON) is a continental-scale observation facility operated by Battelle and designed to collect long-term open access ecological data. The Observatory's comprehensive design supports greater understanding of ecological change and enables forecasting of future ecological conditions in the United States.



NEON statistically partitioned the continental U.S., Hawaii, and Puerto Rico into 20 ecoclimatic Domains that represent distinct regions of vegetation, landforms, and ecosystem dynamics to capture the full range of U.S. ecological and climatic diversity. In each Domain, NEON collects data on plants, animals, soil, nutrients, freshwater, and the atmosphere using sensor measurements and field observations. Airborne remote sensing data combined with local, site-level data capture contiguous site-level information and can be combined with existing satellite data to support regional to continental characterization of ecological processes.

81 Field Sites
47 terrestrial
34 aquatic

20 Ecoclimatic Domains

24 States +1 territory with sites

Consistent, comparable, high-quality data

NEON assures high-quality, comparable data through standardized and quality-controlled data collection and processing methods. The Observatory employs multidisciplinary experts to design and implement infrastructure that provides high-quality data and associated documentation to the community.

Integrated data collection

NEON collects integrated biological, physical, and chemical measurements and samples at all of its field sites using a combination of field-based protocols, as well as in situ and remote sensing methods and technologies, to support the study of complex ecological processes. This coordinated data collection strategy uniquely addresses ecosystem level questions in several key themes, such as biogeochemistry and ecohydrology.



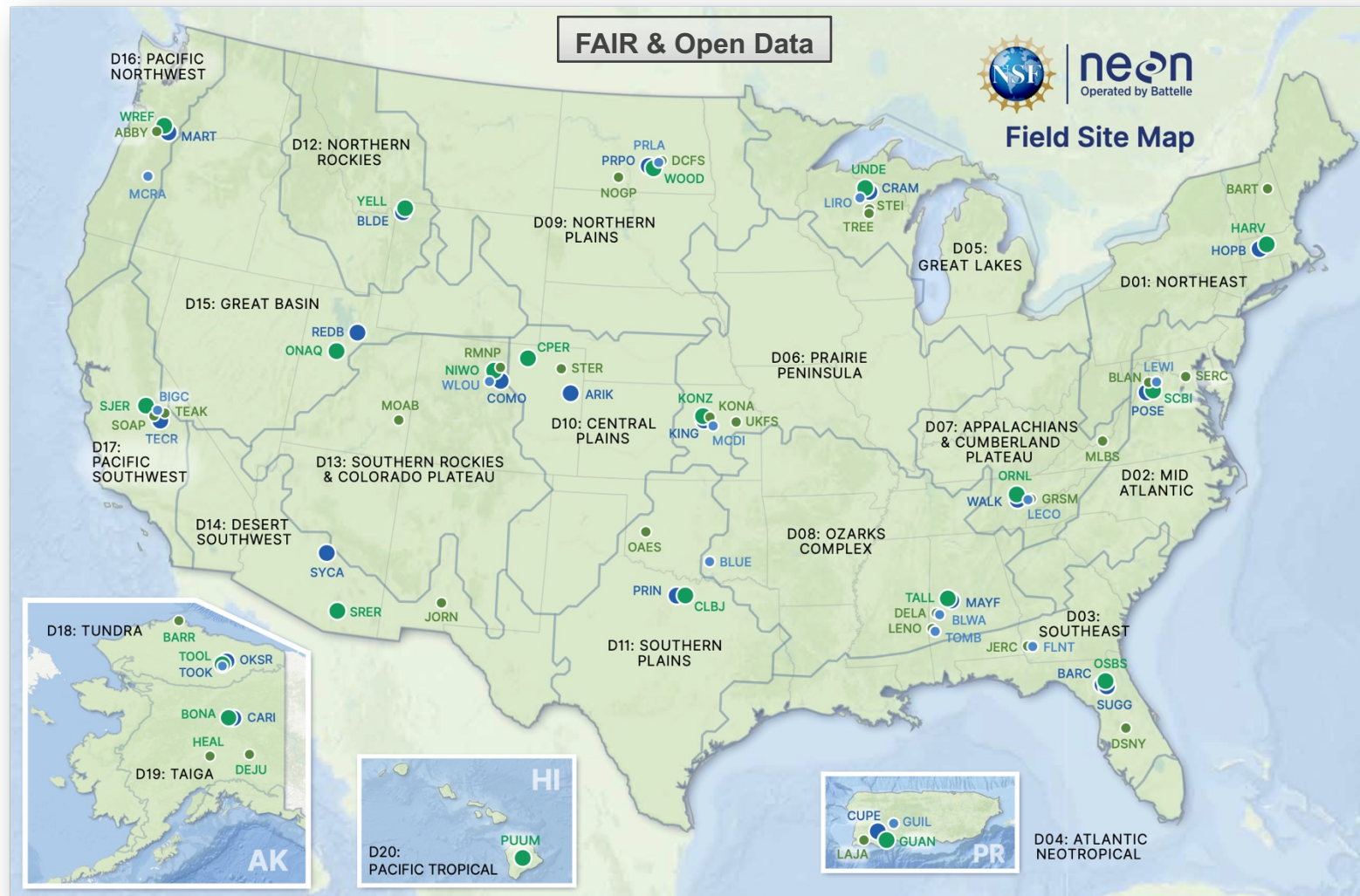
Tick sampling, D19
Healy, Alaska

Open data and samples

All NEON data are free and open data to everyone. Our data products are downloadable in standard formats that are in general use throughout the scientific community. NEON also provides documentation and tutorials to support understanding and interpretation of our data products. The NEON Biorepository is built to house millions of samples collected at our field sites over the course of NEON's lifetime. These samples are available to be loaned to researchers for study, including for destructive purposes.

to learn more and explore the resources, visit NEONscience.org

NEON is a distributed Observatory across the U.S.



81 Field Sites
47 terrestrial
34 aquatic

>180
Data Products

30 Years of
Data

How we collect data and samples



Automated
instrument systems



Observational
sampling

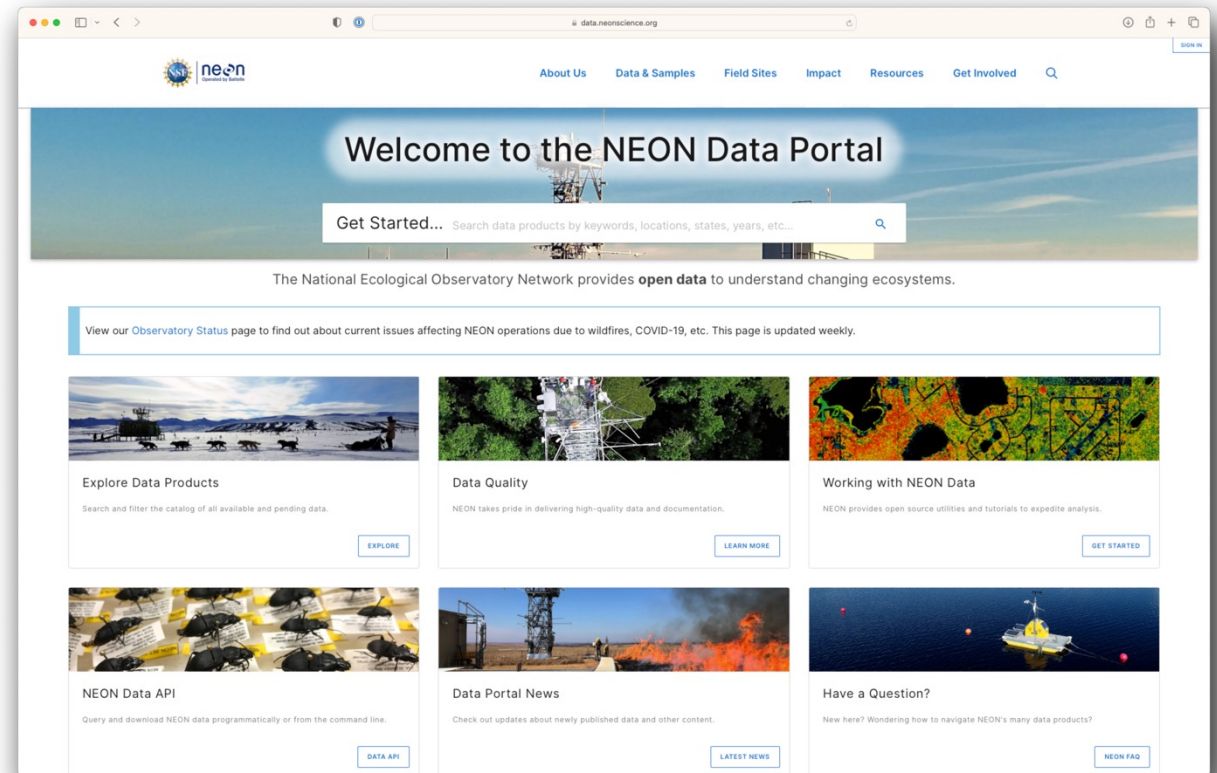


Airborne Observation
Platform



NEON Data Portal: data.neonscience.org

- Explore and download data
- Access via
 - Data Portal
 - Application Programming Interface (API)
 - Partner organizations
- Also access to
 - Data product user guides, detailed protocols, other important documents
- Data updates and news



PEOPLE 
~600 total staff
320+ full time
250-290 SEASONAL
Domain techs

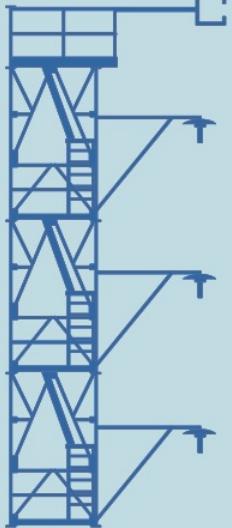
National Ecological Observatory Network BY THE NUMBERS

DATA PRODUCTS 180+

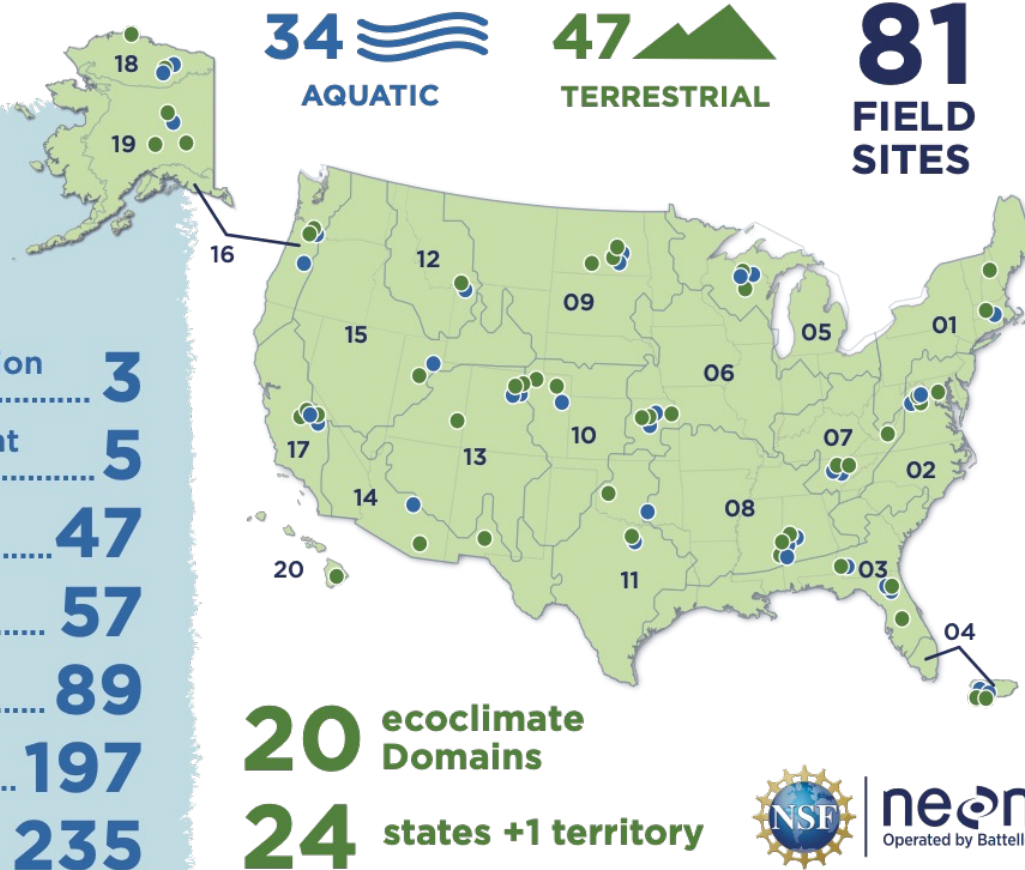
400,000+
SAMPLES TO DATE

100,000+
SAMPLES ADDED PER YEAR

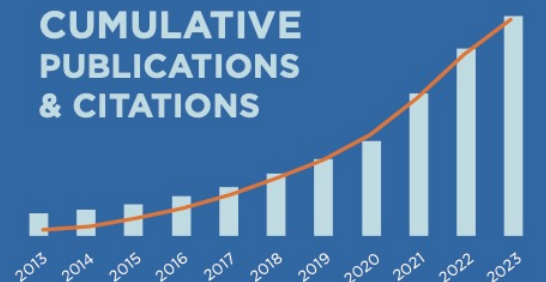
PHYSICAL INFRASTRUCTURE



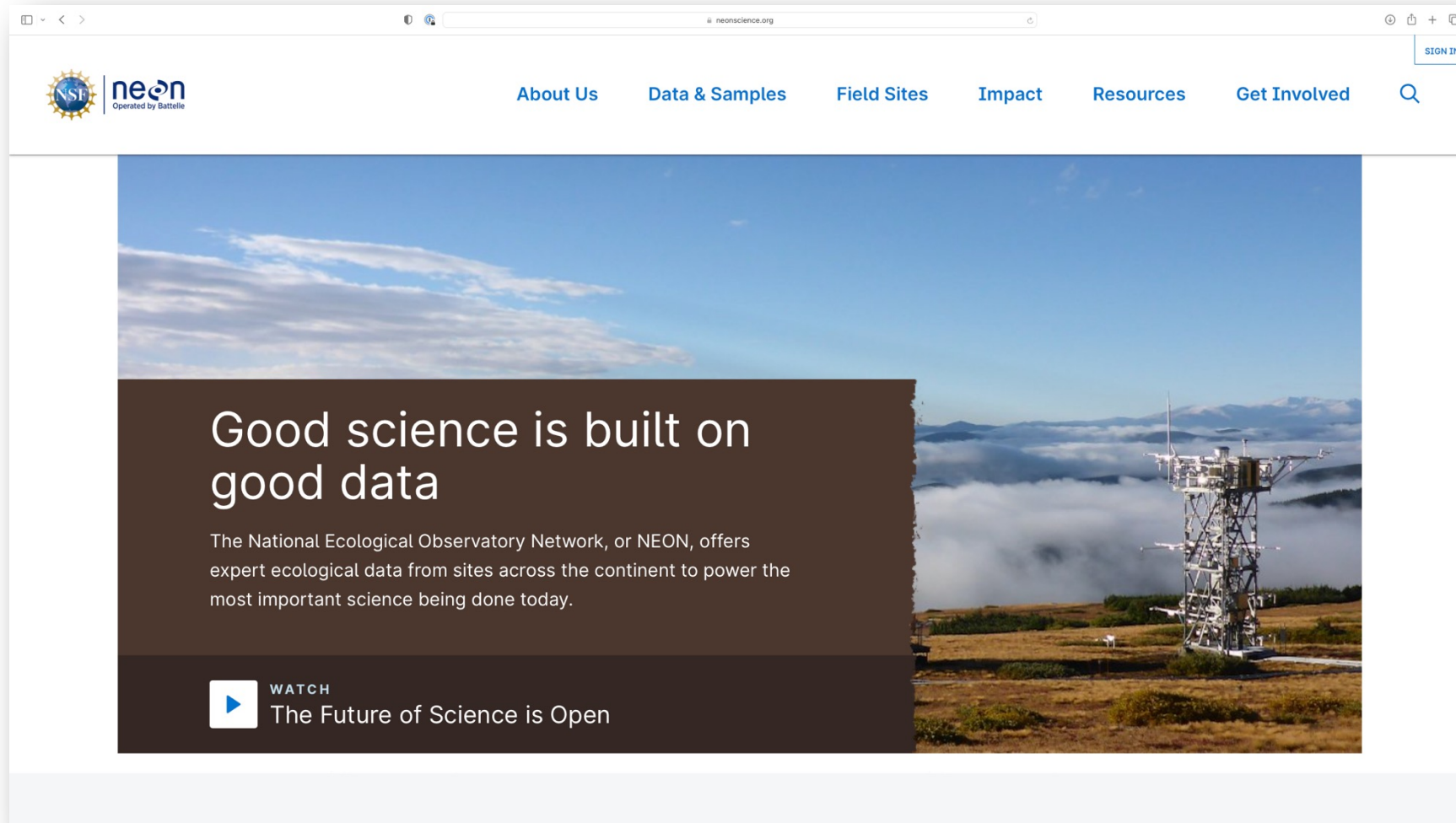
airborne observation platforms.....	3
mobile deployment platforms (mdp).....	5
flux towers.....	47
water quality stations.....	57
meteorological stations.....	89
groundwater wells.....	197
soil sensor arrays.....	235



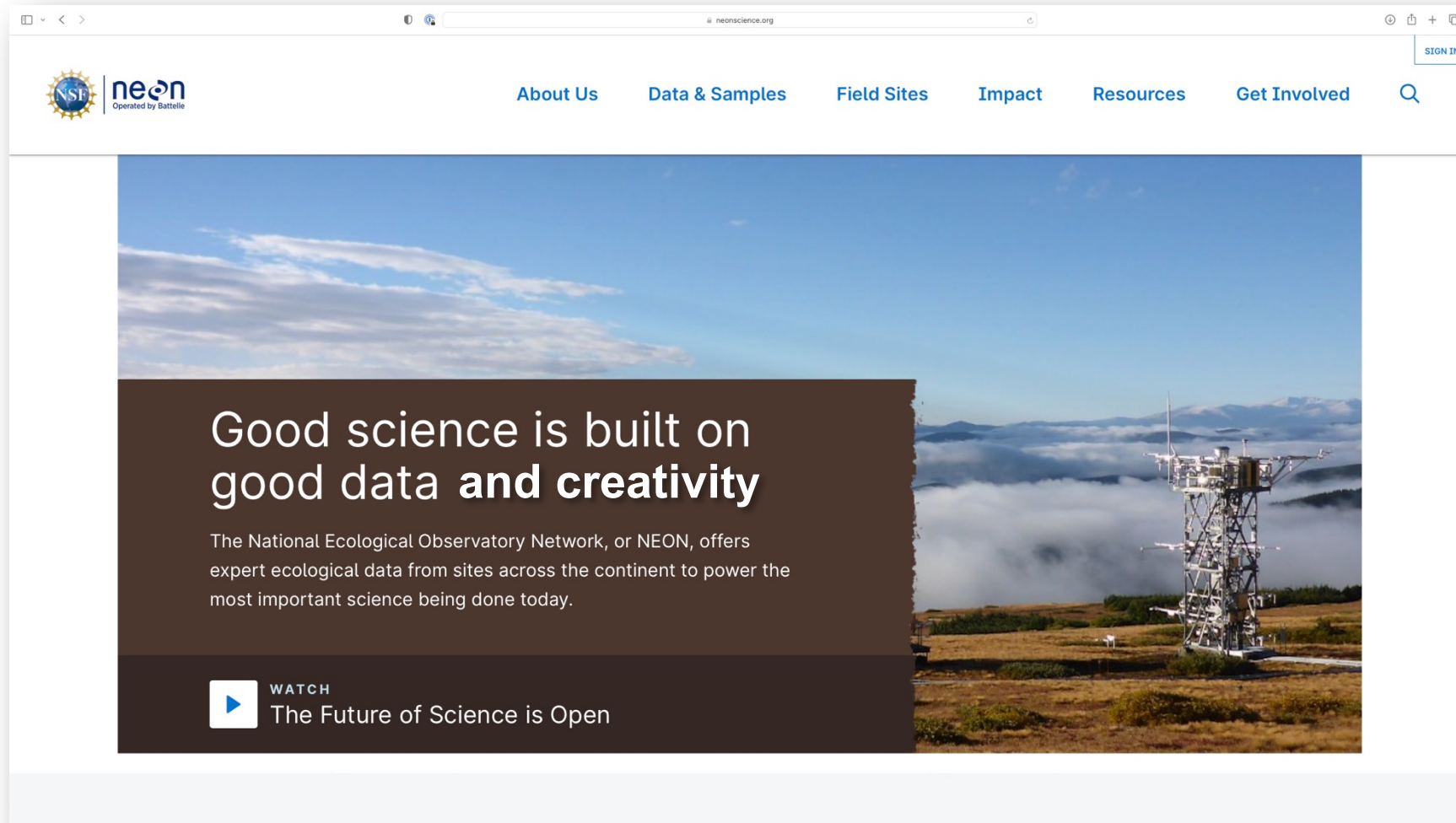
600+ PUBS
USING NEON DATA OR RESOURCES



Good science is built on good data



, . . . and creativity



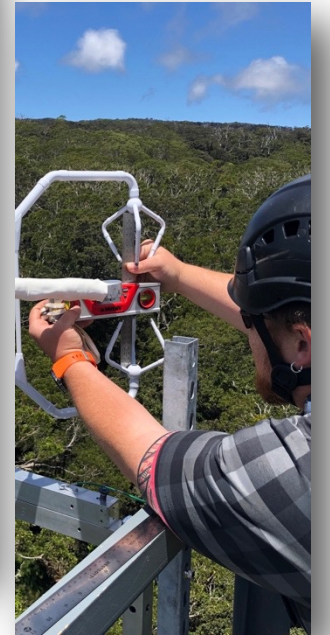
NEON Assignable Assets Program Overview



www.neonscience.org/resources/research-support

NEON Assignable Assets Program

Makes available certain components of NEON's infrastructure, scientists, engineers, field ecologists and technicians to members of the community to support their own research or other activities



NEON Assignable Assets Program – Guiding Principles

- Leverage NEON infrastructure for community engagement
- Avoid conflicts with NEON's mission and scope
- Avoid interference with current NEON measurements
- Project support on a cost-recoverable basis*

*NSF's funding model for NEON and external research; other NSF research infrastructure have different funding models

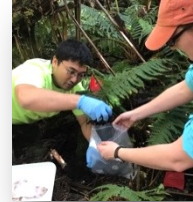
- Process of Evaluating and Implementing Requests:
 - Feasibility and Technical Review
 - Cost analysis and pricing of project
 - Contract / Work Agreement



NEON Assignable Assets Program – Services



**Observational Sampling Infrastructure
(OSI)**



**Excess Samples Requests
(ESR)**



**Sensor Infrastructure
(SI)**



**Field Site Coordination
(FSC)**



**Airborne Observation Platform
(AOP)**



**Subject Matter Expertise
(SME)**



**Mobile Deployment Platform
(MDP)**



**Letters of Support / Collaboration
(LoS / LoC)**

www.neonscience.org/resources/research-support

NEON Assignable Assets Program – Services



Observational Sampling Infrastructure (OSI)

- Access to our field sampling and observational plots
- Trained field ecologists for additional sampling or data collection

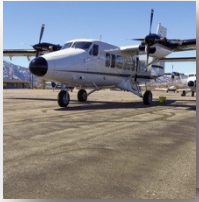


Sensor Infrastructure (SI)

- Access to the physical infrastructure at the sites
- Tower, instrument hut, power and communications, soil arrays, aquatics



NEON Assignable Assets Program – Services



Airborne Observation Platform (AOP)

- Access to flight surveys using the NEON Twin Otter aircraft and remote sensing platform
- Three instrument payloads



Mobile Deployment Platform (MDP)

- Mobile tower infrastructure and subset of NEON terrestrial and aquatic sensors
- Deployable to remote location to collect NEON-like data

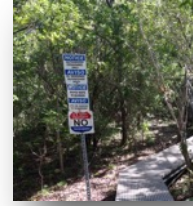


NEON Assignable Assets Program - Services



Excess Samples Requests (ESR)

- Observational sampling generates an excess of samples than are needed for archiving or analysis
- Researchers can request access to the excess before they are destroyed



Field Site Coordination (FSC)

- Occurs when researchers want to do research at or adjacent to NEON sites
- Does not require access to plots, infrastructure or require any labor or field support



NEON Assignable Assets Program – Services



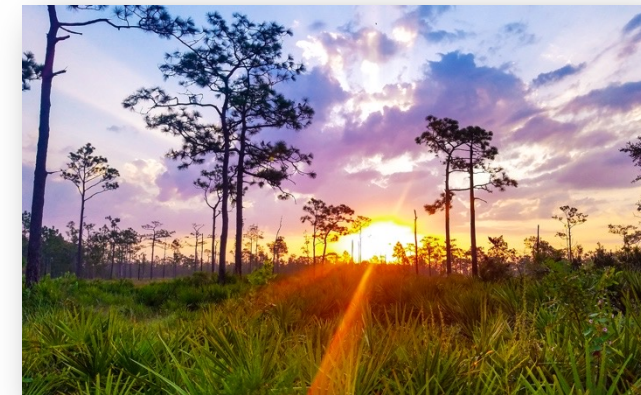
Subject Matter Expertise (SME)

- Professional, trained field ecologists in NEON protocols and equipment and local ecosystems
- Access to NEON scientists, data scientists, and engineers



Letters of Support / Collaboration (LoS / LoC)

- Letters of Support or Collaboration for proposals or other needs
- Handled via the Assignable Assets



Associated Unique NEON Resources & Services

NEON Megapit and Distributed Initial Characterization Soil Archives

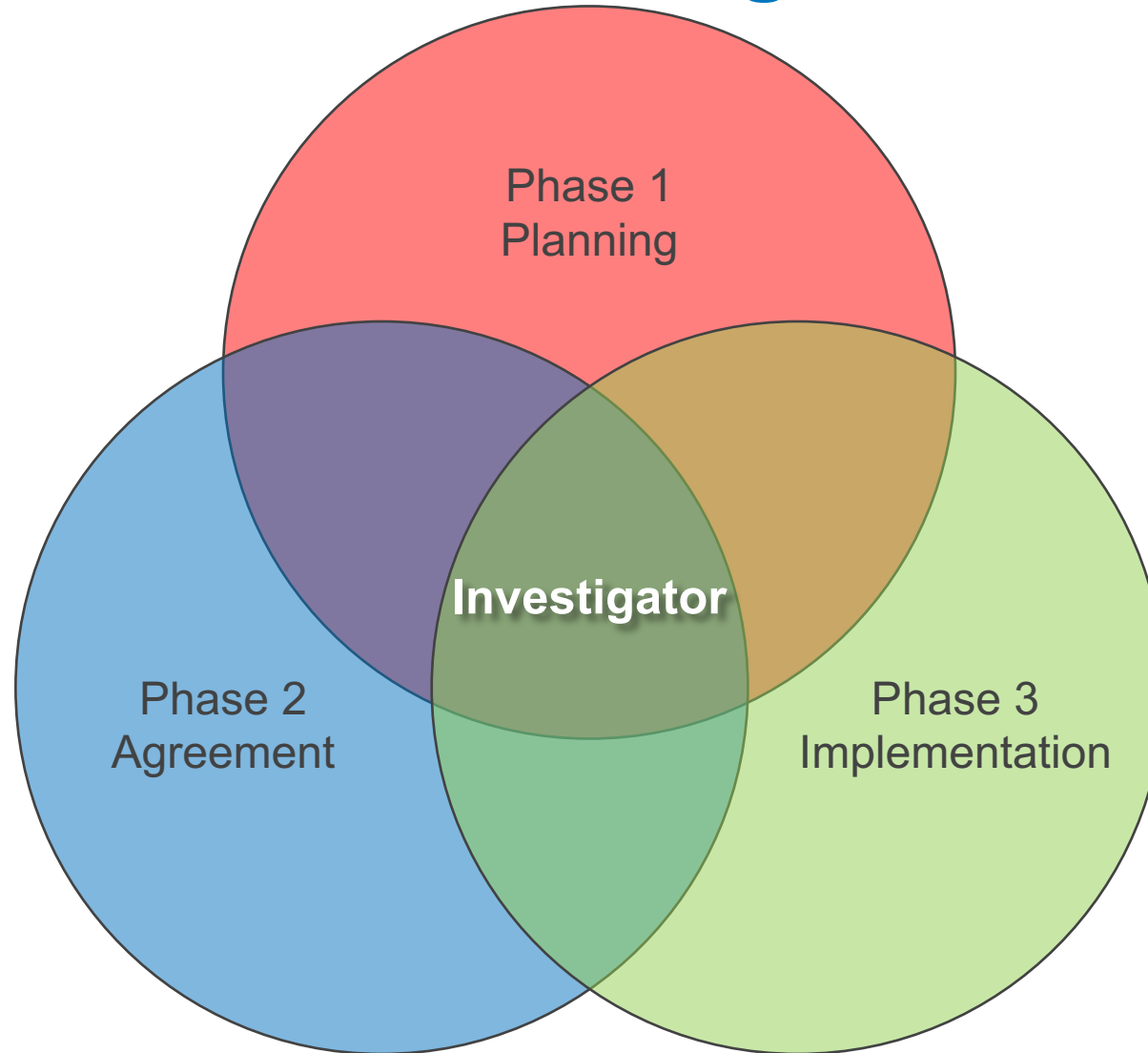


NEON Biorepository

<https://biorepo.neonscience.org/portal/>



NEON Assignable Assets Program – Customer Focused



Positive Community Response - NEON Assignable Assets Program Growth



Assignable Asset Project Requests and Services

Project Requests

Funding Source	Number
NSF	192
NASA	34
University	31
Private	26
Not Specified	15
DOE	13
Other – Federal Agency	11
Mixed – Federal Agencies	6
DOD	5
State Govt. Agency	5
Foreign Govt. Agency	4
USDA	3
USGS	3
NOAA	1
Mixed Sources	1
TOTAL	350

Services Requested

Requested Service(s)*	Number
Observational Sampling Infrastructure (OSI)	115
Sensor Infrastructure (SI)	111
Field Site Coordination (FSC)	78
Airborne Observation Platform (AOP)	35
Mobile Deployment Platform (MDP)	13
Excess Sample Request (ESR)	3
Subject Matter Expertise (SME)	2
TOTAL	357

* More than one type of service can be requested on a single project request

Total Project Requests (AY16-Present)

350

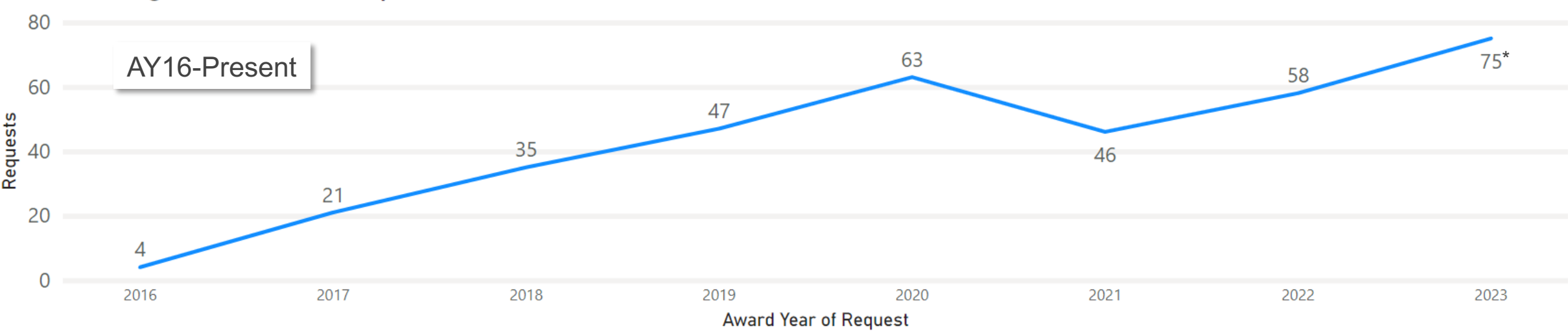
Total Service Requests (AY16-Present)

357

AY16 - AY23 (9/12/2023)

NEON Assignable Asset Project Requests

NEON Assignable Asset Requests



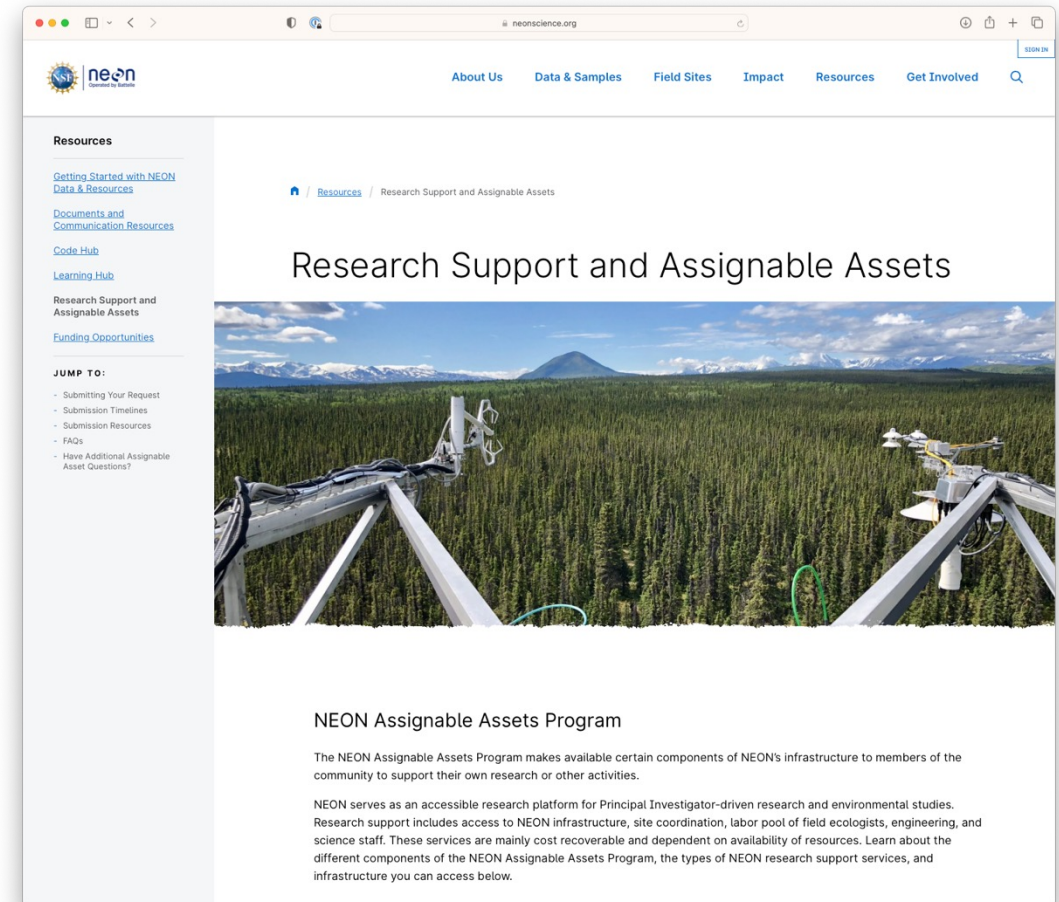
* AY23 is still active, and requests continue coming in

Requesting Research Support



Assignable Asset Request Form Location(s)

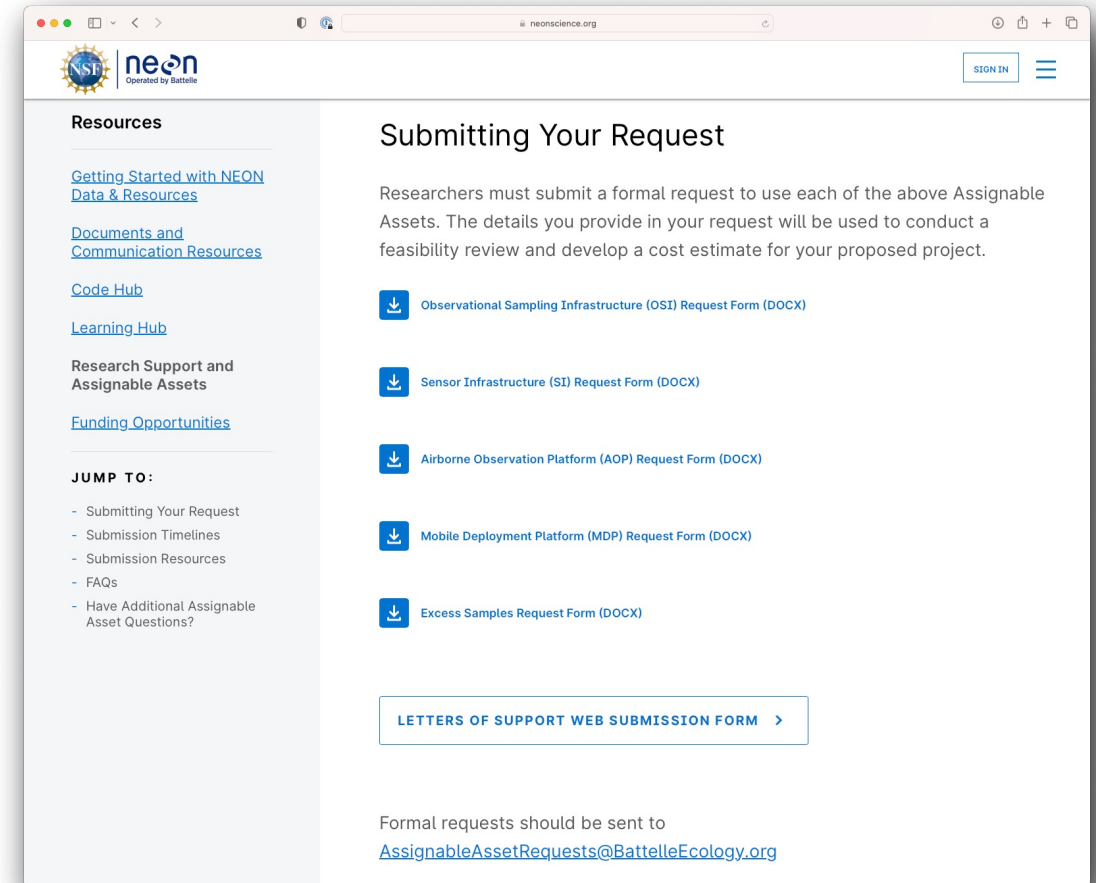
- NEON website
 - Research Support and Assignable Assets web page
 - www.neonscience.org/resources/research-support



Assignable Asset Request Form Location

- Word-based request forms for:
 - Observational Sampling Infrastructure (OSI)
 - Sensor Infrastructure (SI)
 - Airborne Observations Platform (AOP)
 - Mobile Deployment Platform (MDP)
 - Excess Samples Request (ESR)
- Web-based forms for:
 - Field Site Coordination (FSC)
 - Letters of Support/Collaboration (LoS/LoC)

Email to: AssignableAssetRequests@BattelleEcology.org



What Information is Requested?

- Principal investigator and contact information
- Project overview
 - Project scope
 - Location
 - Dates
 - Funding status and sources
- Additional information
 - Site access
 - Power availability, etc.

NEON Assignable Asset Request – Sensor and Instrument Infrastructure (SI)

☐ Yes ☐ No

I. PROJECT OVERVIEW

A. CONTACT INFORMATION

INVESTIGATORS	ROLE	AFFILIATION	EMAIL	PHONE
Click or tap here to enter text.	PI	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	CO-I	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	CO-I	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	ASSISTANT	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

1) Who is the primary contact for this request?
Click or tap here to enter text.

B. REQUEST INFORMATION

1) What services are being requested (check all that apply)?

☐ Site Coordination

☐ Instrument Installation Support

☐ Instrument Maintenance Support

☐ NEON Field Staff Support

2) If your project is implemented by the NEON Assignable Assets program, your project summary details will be showcased the NEON website and potentially used in NEON presentations. This will increase the visibility of your research, highlight your use of NEON field and mobile resources, and facilitate data discovery for your project.

If you do not have your project listed on the NEON website, please check the box below.

☐ Do not display project details on NEON website or in NEON presentations

C. NEON DELIVERABLES

1) What is the latest possible date you need the budget and letter of support from NEON? This date should be the date your institution needs this information (which may be sooner than the proposal deadline).

Click or tap to enter a date.

2) Is this date flexible?

1

NSF | NEON | v.001-2021.04.28

NEON Assignable Asset Request – Sensor and Instrument Infrastructure (SI)

☐ Yes ☐ No

D. FUNDING INFORMATION

1) What is the status of funding?
☐ Funding Secured ☐ Seeking Funding

2) Please list the funding agency and program information in the table below

FUNDING AGENCY:	PROGRAM:	SOLICITATION URL:
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

3) What is the expected funding notification date?
Click or tap to enter a date.

E. PROJECT INFORMATION

1) Please list the project title as it will appear in your proposal submission, or the title of the funded proposal (able to update later if necessary):

Click or tap here to enter text.

2) Provide a quick overview of the proposed research project (one sentence up to one paragraph). What is the research question and why does it require the use of NEON SI infrastructure?

Click or tap here to enter text.

3) What are Battelle's/NEON's deliverables for your project? Briefly describe the unique and verifiable sample, product, service or result you are requesting?

4) Describe why access to NEON's sites, services or infrastructure is required.

Click or tap here to enter text.

5) What is NEON's role in your project? Briefly describe the activities or roles that you are requesting NEON personnel to perform in the field, lab or for site coordination (more details will be requested in Part II Project Scope and Requirements):

Click or tap here to enter text.

6) Briefly describe the activities or roles (if any) that you and your team will be performing at NEON sites:

Click or tap here to enter text.

F. DURATION OF PROJECT AND FIELD WORK

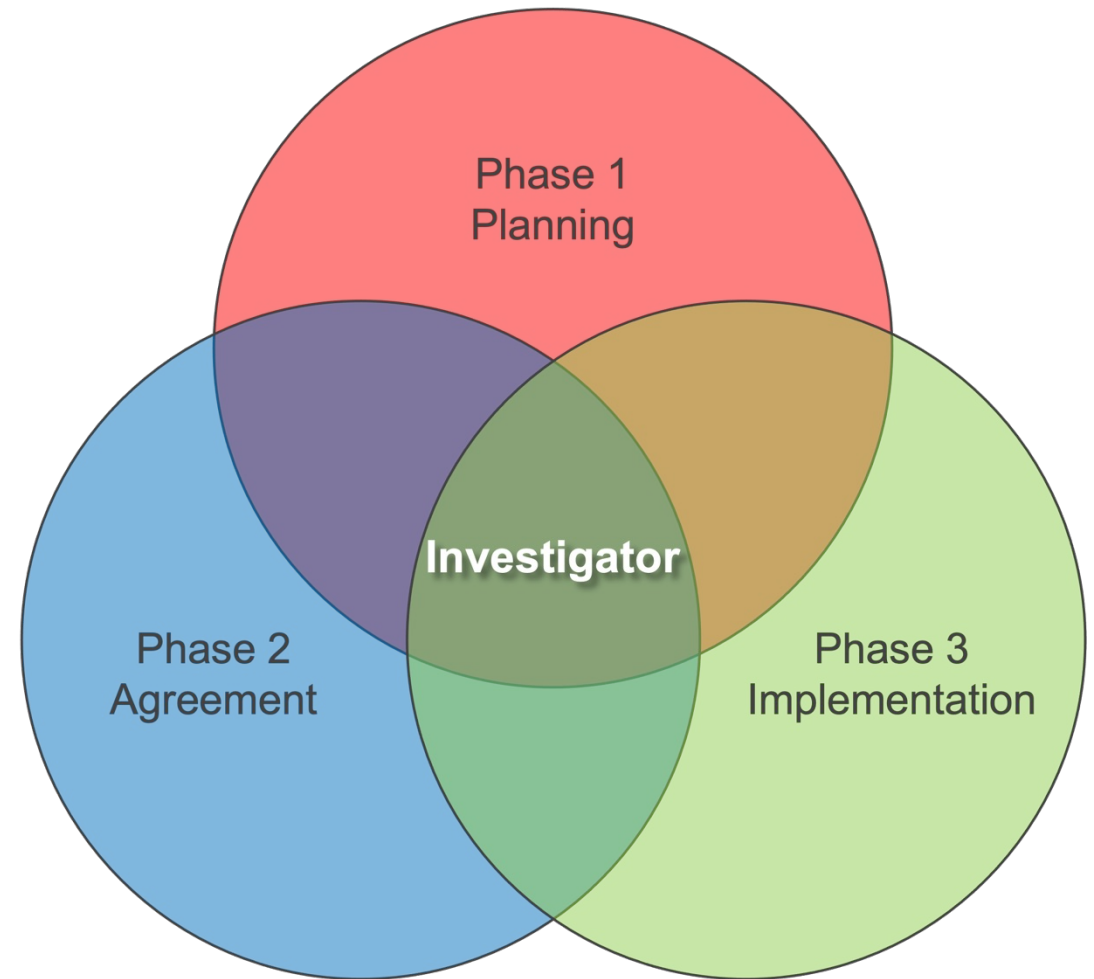
2

NSF | NEON | v.001-2021.04.28

What if my project details aren't solidified?

- Conversation and collaboration with the is expected
- Contact us early
- Complete the form as accurately as possible
 - Project goals and requirements
 - Where there is flexibility

Email to: AssignableAssetRequests@BattelleEcology.org

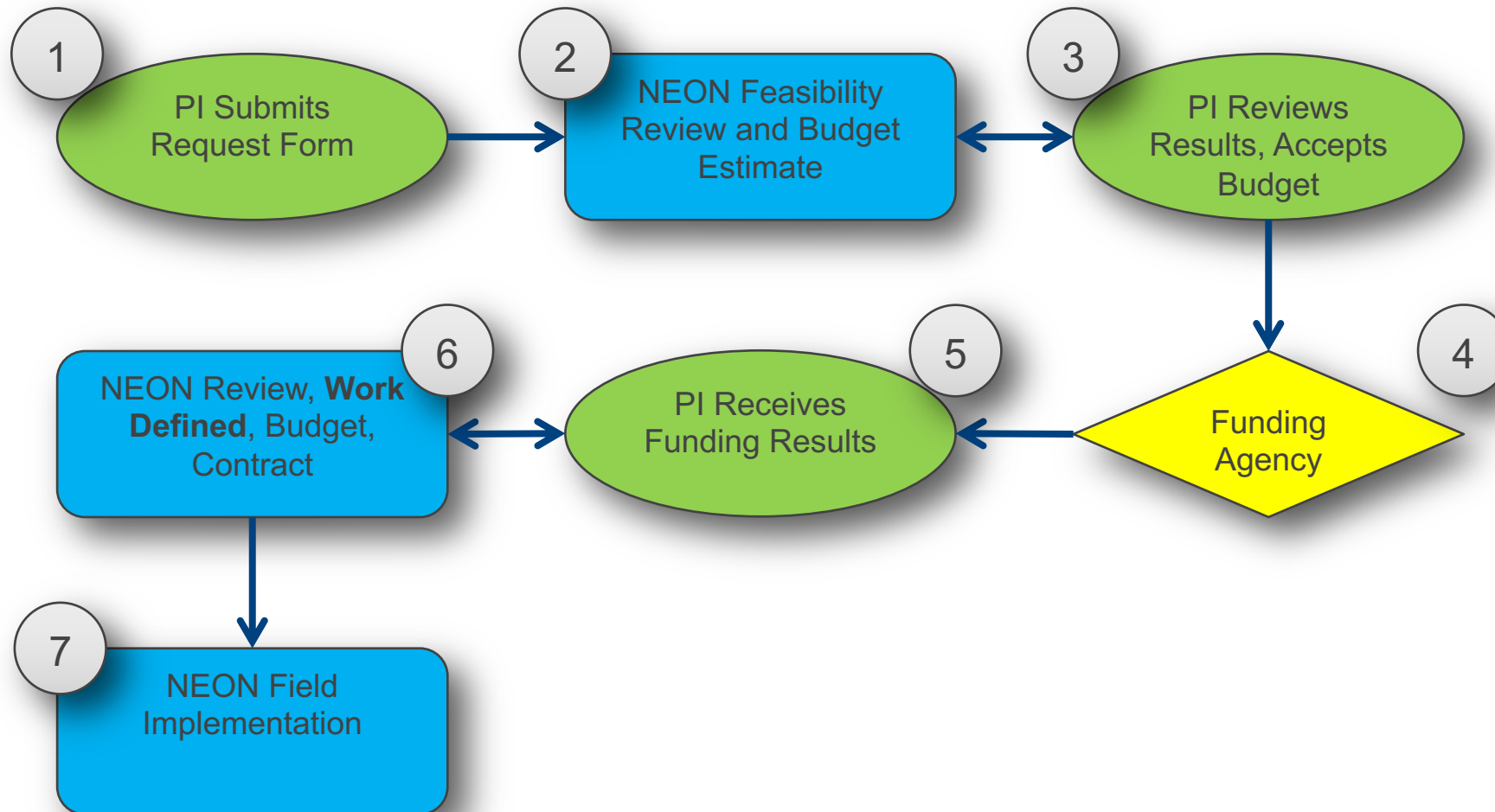


Request Process

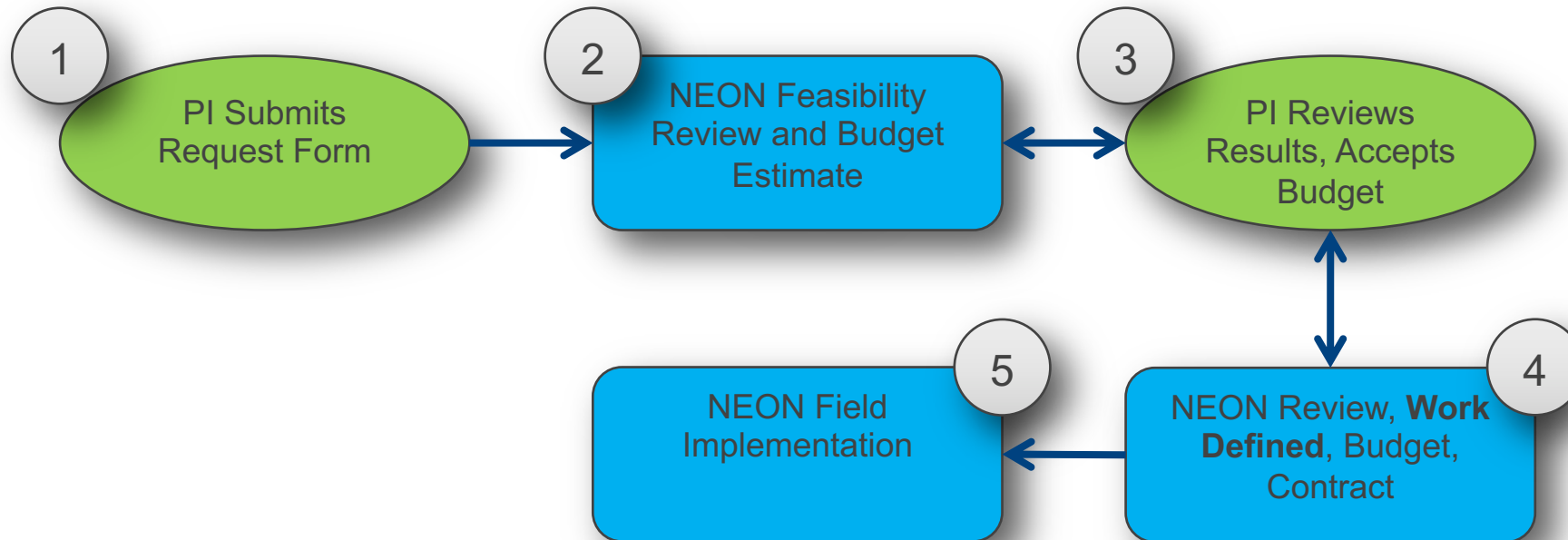


CRAM (D05, Wisconsin)

Simplified AA Request Process Seeking Funding



Simplified AA Request Process Funding Secured



Timelines for an Assignable Asset Request

- **Seeking Funding**

- Submit request at least 6-weeks prior to proposal submission deadlines

- **Funding Secured**

- Submit request at least 8-weeks prior to proposed start of data collection *

* This assumes prior contact with NEON Assignable Assets Program, locations finalized and permits acquired.

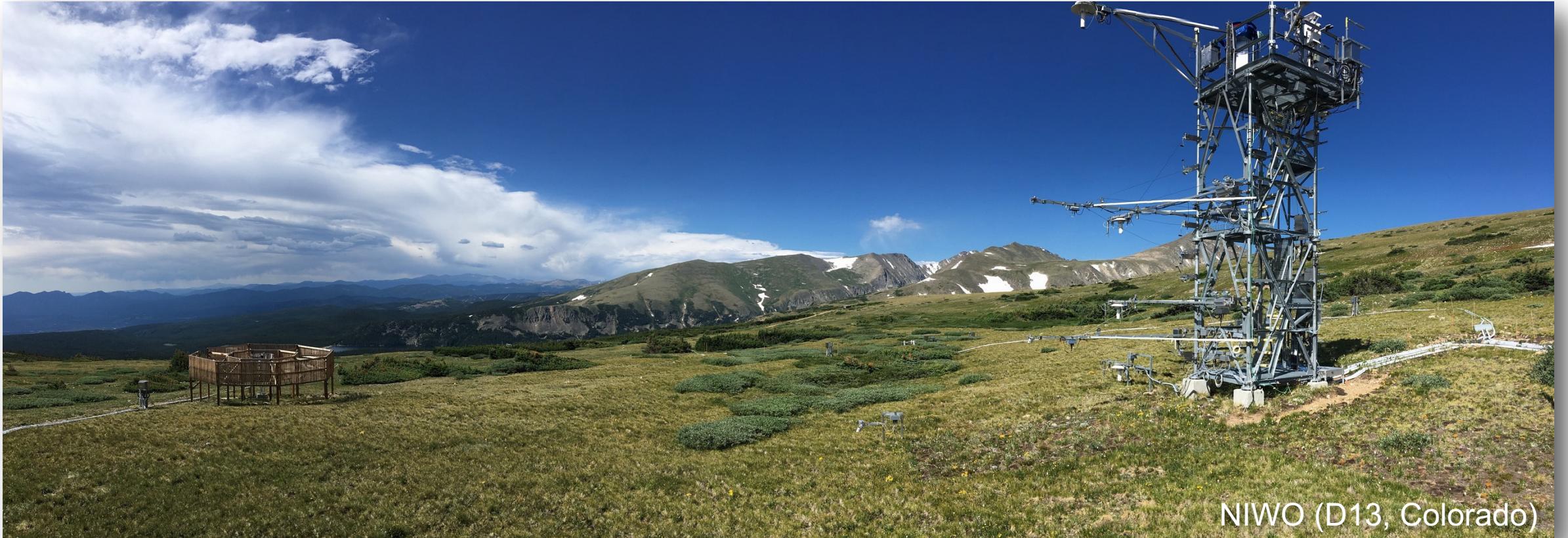


Reasons to submit early

- Time required for:
 - Defining scope and requirements
 - Permitting
 - Contracting
 - Scheduling
 - Finalized contract (if funded)
- Each project is unique
 - Site-specific and project-specific challenges



Example Assignable Asset Projects



Example Assignable Asset Projects

Five examples of funded and currently implementing projects:

1. Simple support project
2. Field installation, maintenance, and sample collection
3. Multiple simultaneous services
4. Complex, extensive field labor
5. MDP deployment



Bird Tracking – PUUM (D20, Hawaii)



Bird Conservation in the Pu'u Maka'ala NAR

The Pu'u Maka'ala NAR is one of 21 reserves established by the Hawai'i Department of Land and Natural Resources Division of Forestry and Wildlife (DLNR-DOFAW) to protect vulnerable ecosystems and native species. It is home to more endangered bird species than any other managed area in Hawai'i.

Alex Wang is one of the researchers working to monitor and protect endangered birds at Pu'u Maka'ala. He is the Endangered Bird Field Supervisor for the Hawai'i Natural Area Reserve System (NARS) and is employed through the Pacific Cooperative Studies Unit (PCSU) of the University of Hawai'i. His team conducts an annual bird survey on eight reserves, including Pu'u Maka'ala, to track the population size and range of endangered species.

Currently, much of his research focuses on the 'akiapōlā'au, a tiny honeycreeper with a distinctive specialized bill. Sometimes called the "Swiss army knife bird," the 'akiapōlā'au has a short lower mandible that allows them to drill into trees like a woodpecker and a long, curved upper mandible to scoop out insects. They are critically endangered and found only in the koa and 'ōhi'a forests in the upper elevations of the Big Island. "There are so many basic questions we have about these birds," Alex says. "How many birds are there in the NAR? How far do they travel? When is their breeding season?"



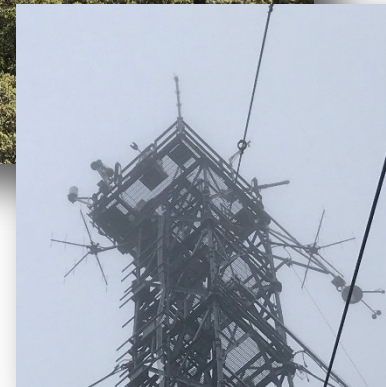
The 'akiapōlā'au is a stocky Hawaiian honeycreeper endemic to the island of Hawai'i. Photo credit: U.S. Fish and Wildlife Service

DLNR-DOFAW has been working to restore forestland in the Pu'u Maka'ala NAR. Parts of the NAR were once owned by the state prison system and used for cattle grazing. Over the last decade, DLNR-DOFAW has replanted thousands of koa trees in and around the NAR and installed fencing to keep feral pigs from destroying young trees and understorey vegetation. Alex's ongoing work will monitor the impact that this habitat expansion and protection has on the population of critically endangered birds. "We hope to see a doubling of the population of 'akiapōlā'au in the NAR as a result of the tree planting and predator control measures," he says.

In addition to bird banding, Alex and his team are now tracking the 'akiapōlā'au with radio telemetry. Radio tags attached with tiny harnesses allow researchers to identify individual birds and track their movements. Antennae attached to radio towers in and around the NAR pick up signals from the tags. One of these antennae is attached near the top of the NEON flux tower, more than 100 feet above the forest floor. The height provided by the NEON tower will greatly expand the antenna's range.



One of these antennae is attached near the top of the NEON flux tower, more than 100 feet above the forest floor. The height provided by the NEON tower will greatly expand the antenna's range.



AA Project #
2018-18

Principal Investigator
Pang-Ching

Lead Institution
Hawaii Dept. of Natural
Resources

Requested Services
SI

Sites
PUUM

Duration
Long-term, 5+ years

Funding Source
Hawaii Dept. of Natural
Resources

NEON Support Cost
<\$5K

Aerial Dispersal in Fungal Movement



[NEON Blog Post Weblink](#)

AA Project #
2018-08

Principal Investigator
Chaudhary

Lead Institution
Dartmouth College

Requested Services
SI, FSC

Sites
20 Terrestrial

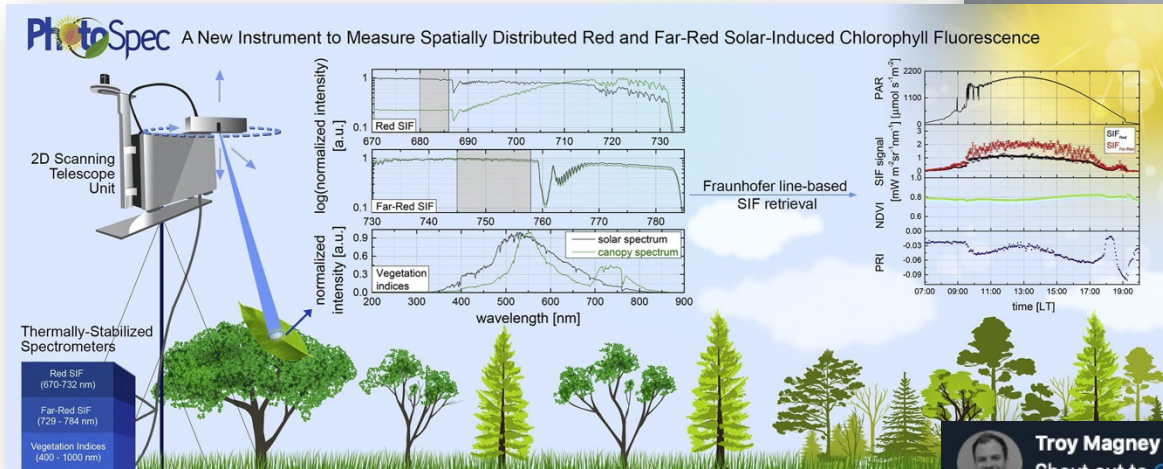
Duration
3 years

Funding Source
NSF
CAREER

[Award Abstract # 2205650](#)

NEON Support Cost
\$24K

Solar-Induced Chlorophyll Fluorescence



NEON Assignable Assets

- SI: Installation of PhotoSpec on tower
 - Power and communications
- OSI: Monthly conifer needle sampling
 - Field ecologists time and effort
- FSC: Additional sampling sites
 - 9 additional NEON sites for PI to sample conifer needles

AA Project #
2019-05-06-07

Principal Investigator
Bowling

Lead Institution
Utah State University

Requested Services
SI, OSI, FSC

Sites
OSBS
+9 sites terrestrial

Duration
3 years

Funding Source
NSF
Award Abstract # 1926090

NEON Support Cost
\$17K

Stem Flow and Throughfall



AA Project #
2021-070

Principal Investigator
Van Stan

Lead Institution
Cleveland State University

Requested Services
OSI

Sites
11 terrestrial sites

Duration
5 years

Funding Source
NSF

Abstract Award # 2213623

NEON Support Cost
\$895K

Mobile Deployment Platform

Colorado State University


Prescribed burn @ Konza Biological Station HQ
Deployment: March 28 – May 22, 2022

Prescribed burn: April 15, 2022



Phase 1 Video: youtu.be/te3cZvua_OE
Phase 2 Video: youtu.be/2FsdvPNw5sA

Deployment 2

 **COLORADO STATE UNIVERSITY**


Critical Wildfire Monitoring Utilizing the NEON MDP with Edge-Computing Cyberinfrastructure

Q: Can edge computing and real-time data acquisition effectively guide sensor placement and human observational sampling during and immediately following disturbance?

Couple the MDP with **high-performance computing resources** to enable responsive and **real-time**, data-driven soil sample collection during and immediately following wildfire activity.

Phase 1: Testing & Integration
Test and integrate SAGE Blade, Wild SAGE Node (WSN), thermal imaging camera, and dust monitor with NEON MDP.

Phase 2: Deployment to Wildfire
Deploy the MDP with integrated SAGE equipment and sensors to a contained wildfire or a controlled burn in Colorado during the 2022 fire year.



AA Project #
2021-048

Principal Investigator
Kelly

Lead Institution
Colorado State University

Requested Services
MDP

Sites
Non-NEON locations

Duration
2-3 Months

Funding Source
NSF
RAPID
Award Abstract # 2137769

NEON Support Cost
\$130K

Opportunities and Resources



Funding Opportunities for NEON-Enabled Science

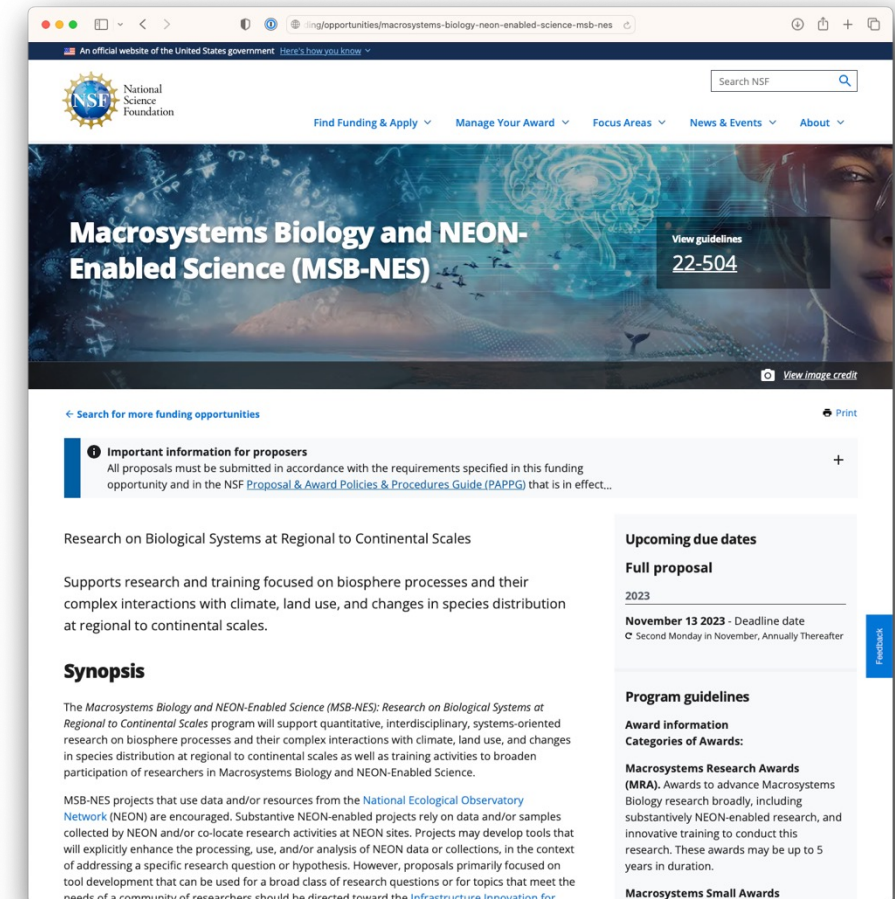
- September 11, 2023
- NSF Division of Environmental Biology (DEB) Virtual Office Hours
- “DEB Funding for NEON-Enabled Science”
- Link to recorded webinar (when posted):
 - deblog.nsfbio.com/office-hours



The screenshot shows a web browser window displaying the NSF DEB Virtual Office Hours registration page. The page features the NSF logo and the text "National Science Foundation WHERE DISCOVERIES BEGIN". Below this, it says "DEB Virtual Office Hours" with social media icons for Facebook, Twitter, LinkedIn, and Email. The "Topic" is "DEB Virtual Office Hours". The "Description" section lists upcoming dates and topics: August 14, 2023: Things I wish I learned earlier about NSF...; September 11, 2023: DEB Funding for NEON-Enabled Science; October 16, 2023: Welcome to DEB; November 13, 2023: Partnership to Advance Conservation Science and Practice (PACSP) update; December 11, 2023: Introduction to the Directorate for Technology, Innovation and Partnerships (TIP). The "Time" section asks users to choose one webinar to attend, with a dropdown menu showing "Oct 16, 2023 01:00 PM" and a note that the time is in Eastern Time (US and Canada). The registration form includes fields for First Name, Last Name, Email Address, and Confirm Email Address, all marked as required. There are also fields for City and State/Province, with a dropdown menu for the latter.

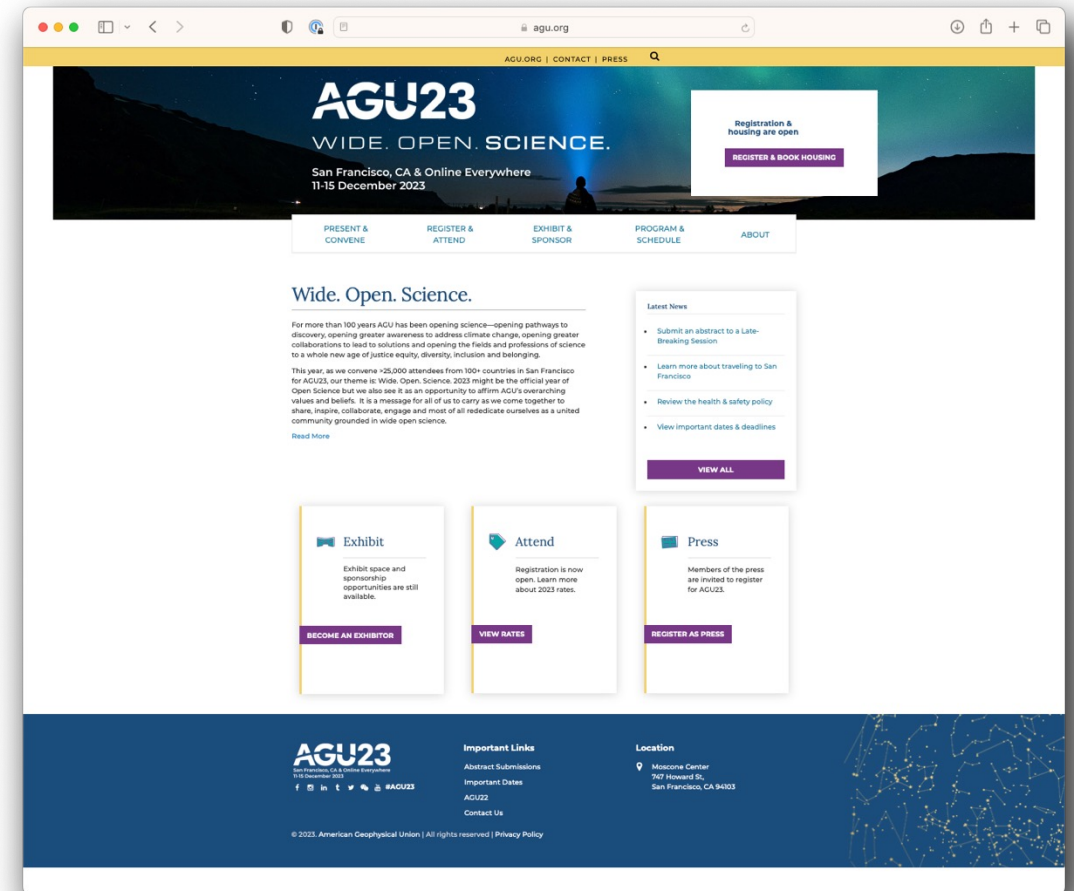
Funding Opportunity | NSF 22-504

- National Science Foundation (NSF)
 - Division of Environmental Biology (DEB)
- Macrosystems Biology and NEON-Enabled Science (MSB-NES)
 - Solicitation [NSF 22-504](#)
 - Upcoming due dates
 - November 13, 2023
 - Second Monday in November, Annually Thereafter



Town Hall | 2023 AGU Fall Meeting

- American Geophysical Union (AGU) 2023 Fall Meeting
- Date: TBD
- Town Hall title:
 - “Supporting the NEON User Community: Updates and Discussion on Using NEON Research Support and Assignable Assets”



Comments from the Panel?



Questions?





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720.746.4844 | neonscience@battelleecology.org | neonscience.org