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Instrumented Systems
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Battelle and NEON are ready for INTERACTion

A project sponsored by the National Science Foundation and proudly operated by Battelle

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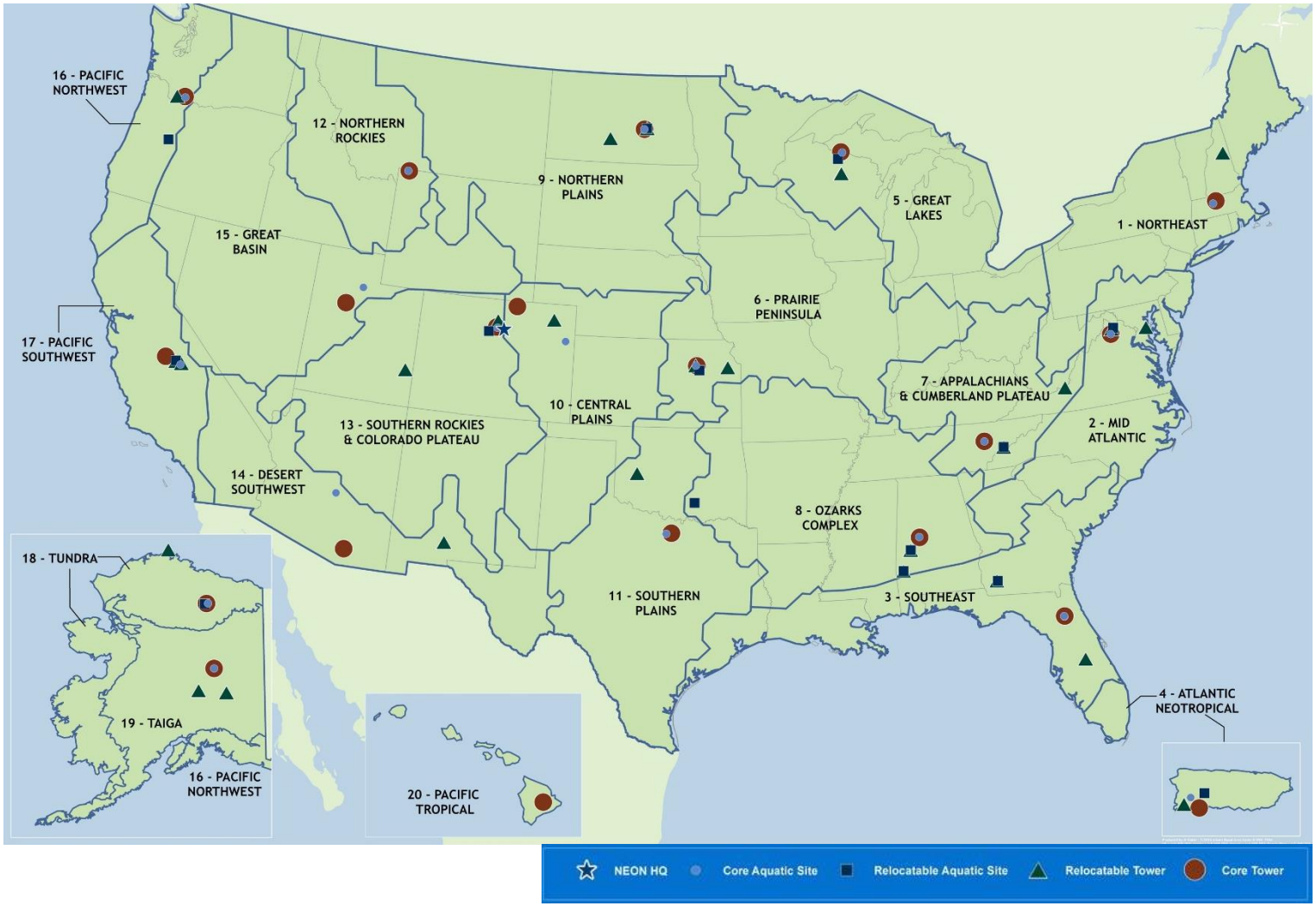
What is the National Ecological Observatory Network (NEON)?

The National Science Foundation's NEON project is a continental-scale ecological observation facility operated by Battelle. NEON provides:

- **Free and open data** on the drivers of and responses to ecological change
- A standardized and reliable framework for research and experiments
- Data interoperability for integration with other national and international network science projects

NEON's field sites and data products



81

FIELD SITES

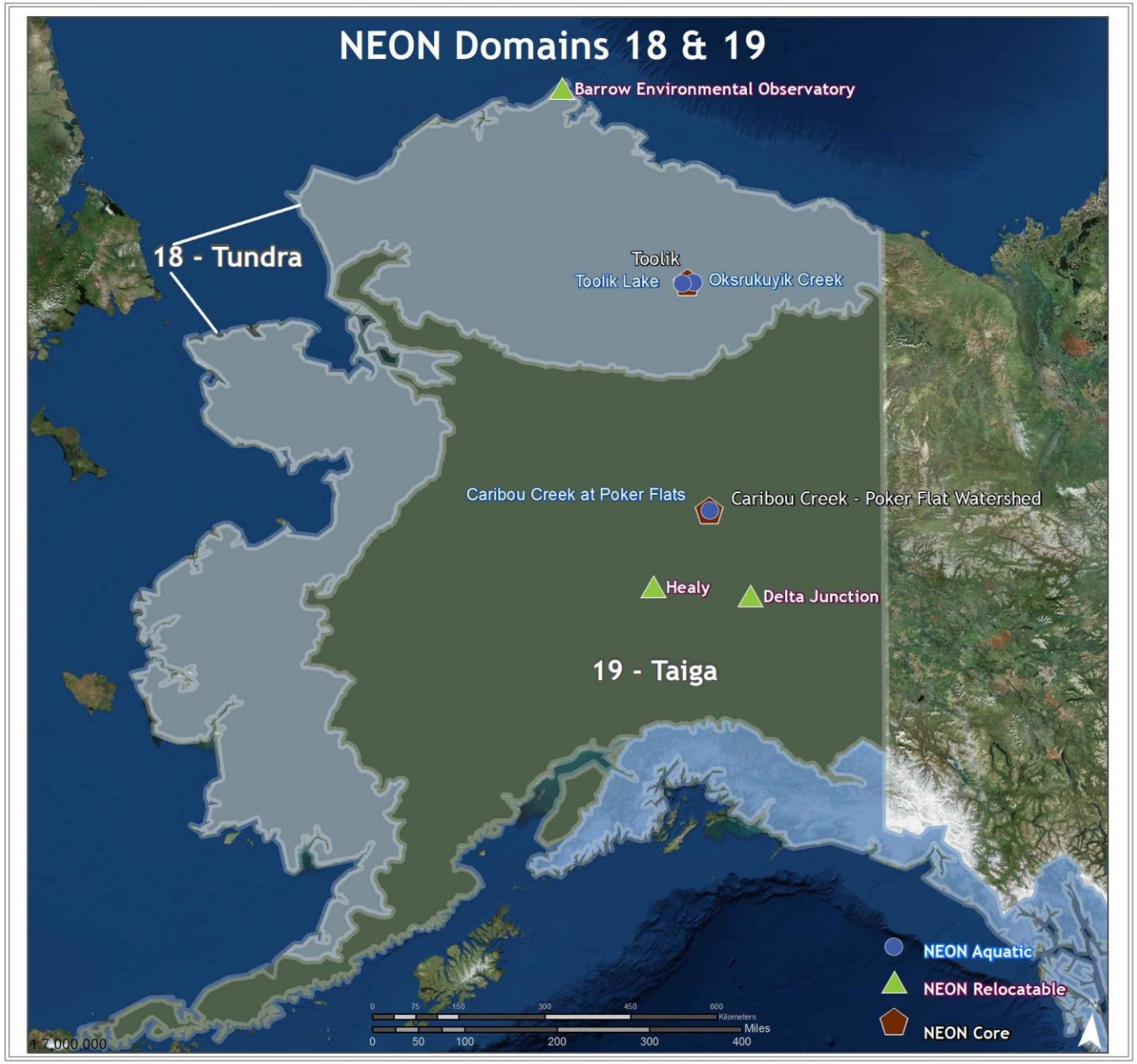
- 47 terrestrial
- 34 aquatic

Over

170

DATA PRODUCTS

NSF | neon Operated by Battelle



Domain 18 Tundra

2 Terrestrial Sites
2 Aquatic Sites

- Barrow
- Toolik

Domain 19 Taiga

3 Terrestrial Sites
1 Aquatic Sites

- Caribou-Poker Creeks Watershed
- Delta Junction
- Healy

NEON's data collection methods

Automated instruments

Observational sampling

Airborne remote sensing

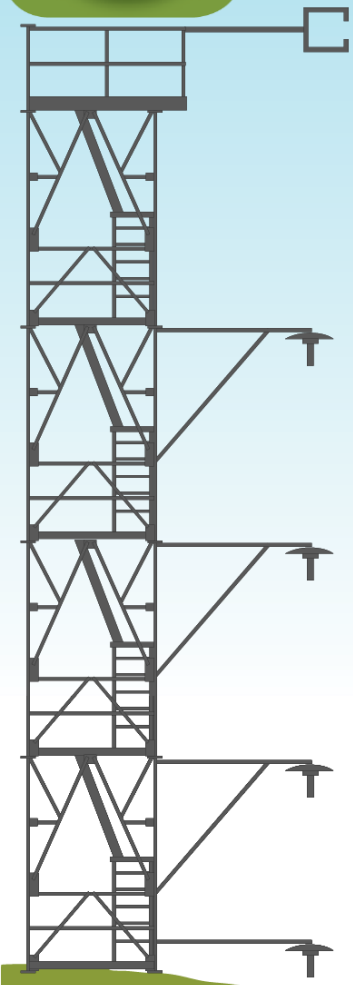
- ✓ These three systems collect data within close proximity of each other at each site
- ✓ Standardized methods are used across all sites

Automated instruments: meteorological data

Flux tower at terrestrial sites

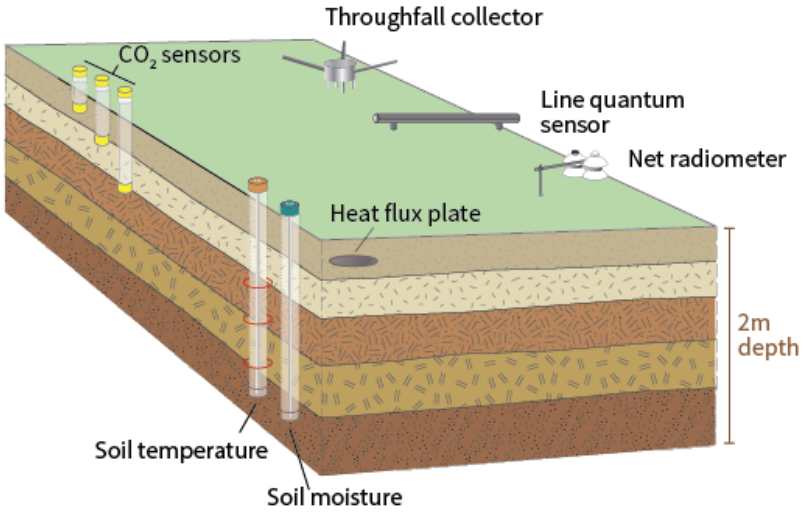
Micrometeorology station at aquatic sites

Terrestrial Instrumented Systems



Measurements	Frequency	Tower top	Mid-levels	Near ground surface
CO_2/H_2O concentration & flux	20 Hz	✓		
3D wind speed & direction	20 Hz	✓		
Dust (particulate mass)	2 wks	✓		
Dust (particulate size)	1 Hz	✓		
Aerosol optical depth	30 min	✓		
Secondary precipitation (absence/presence)	when event occurs	✓		
Direct & diffused radiation	1 Hz	✓		
Incident short-wave radiation	1 Hz	✓		
Net short-wave & net long-wave radiation	1 Hz	✓		
Wet deposition chemistry & precipitation isotope	2 wks	✓		
Phenological image & snow depth	15 min	At the tower top & 3 m above ground		
Isotopes in CO_2, ^{13}C concentrations	.5 Hz	✓	✓	✓
Isotopes in H_2O (^{18}O, ^{2}H concentrations)	.5 Hz	✓	✓	✓
CO_2 concentration	1 Hz	✓	✓	✓
H_2O concentration	1 Hz	✓	✓	✓
PAR (Photosynthetically Active Radiation)	1 Hz	✓	✓	✓
Air temperature	1 Hz	✓	✓	✓
Biological temperature	1 Hz		✓	✓
2D wind speed & direction	1 Hz		✓	✓
Barometric pressure	1 Hz	4.95 m above ground		

Automated instruments: soil and water



An array of soil plots near the flux tower at terrestrial sites collect soil health data

Instruments in the ground, lakes and streams at aquatic sites monitor indicators of water quality

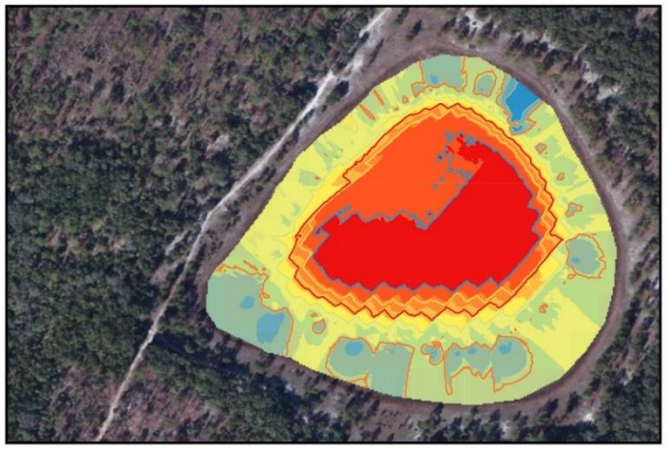
Terrestrial organisms & biogeochemical data

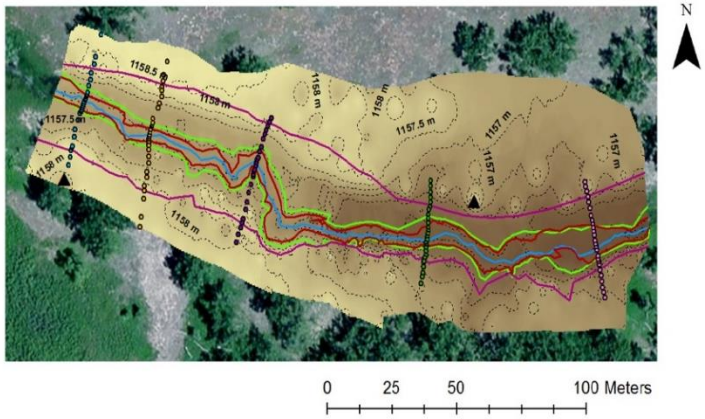
	 Plants	 Soil microbes	 Small mammals	 Mosquitoes	 Birds	 Ground beetles	 Ticks	 Soil
Diversity	✓	✓	✓	✓	✓	✓	✓	
Abundance	✓	✓	✓	✓	✓	✓	✓	
Pathogens			✓	✓			✓	
Phenology	✓			✓			✓	
Pools/fluxes: biogeochemistry	✓							✓
Metabolism		✓						
Productivity & biomass	✓	✓						

Aquatic organisms & biogeochemical data

	 Fish	 Macro-invertebrates	 Microbes	 Algae	 Aquatic plants	 Sediment	 Water
Diversity	✓	✓	✓	✓	✓		
Abundance	✓	✓	✓	✓	✓		
Metabolism	✓	✓	✓	✓	✓		
Biomass	✓	✓	✓	✓	✓		
Pools/fluxes: biogeochemistry	✓	✓	✓			✓	✓

Bathymetry & morphology

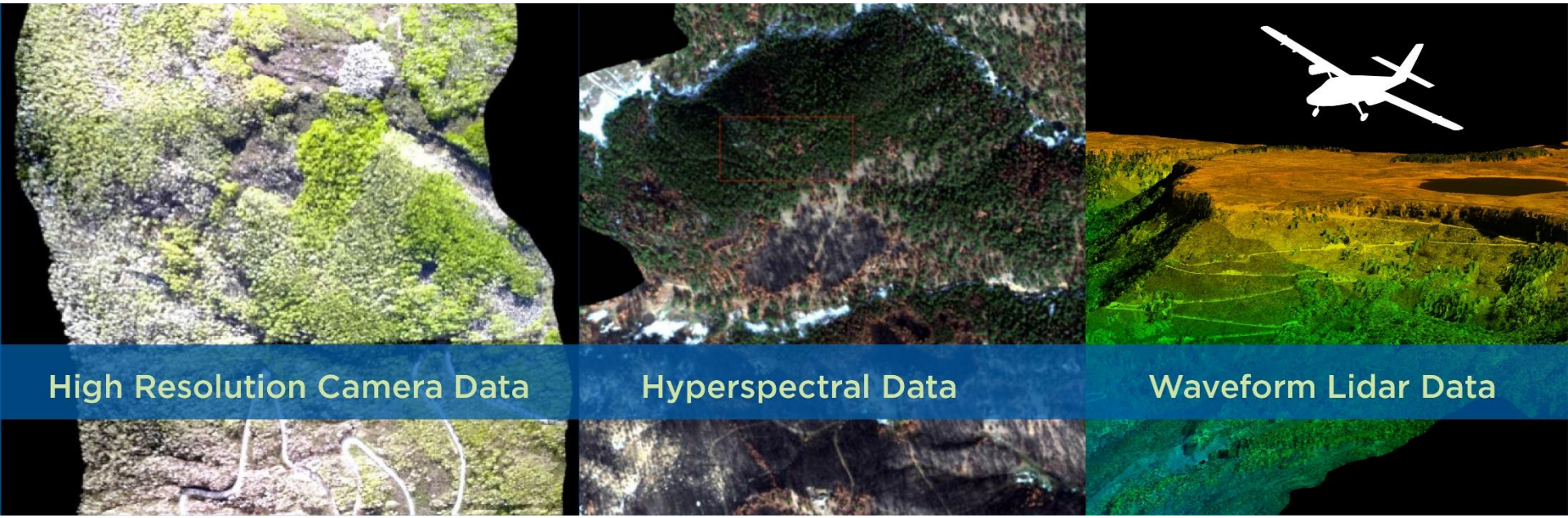




- ✓ Lake bathymetry
- ✓ Stream geomorphology
- ✓ Riparian assessment

Airborne remote sensing

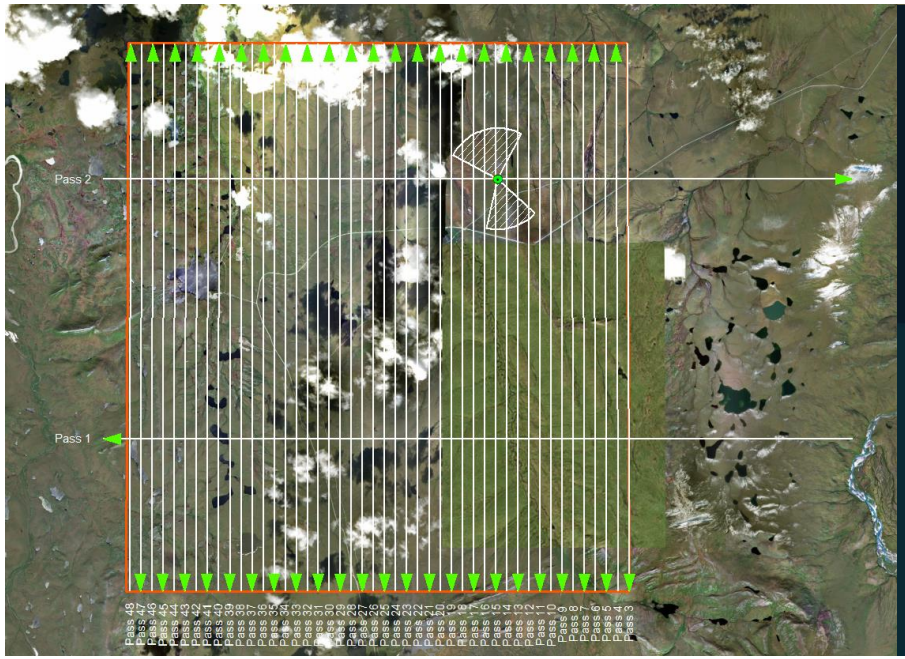
The Airborne Observation Platform (AOP)



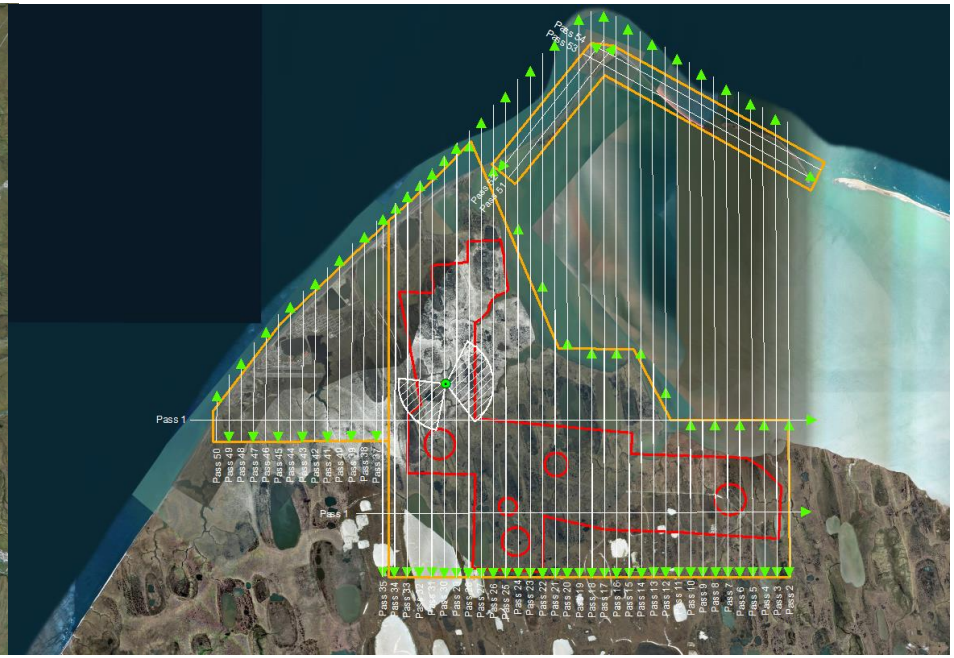
Surveys are conducted at peak greenness over each site

Airborne remote sensing

The Airborne Observation Platform (AOP)



Toolik

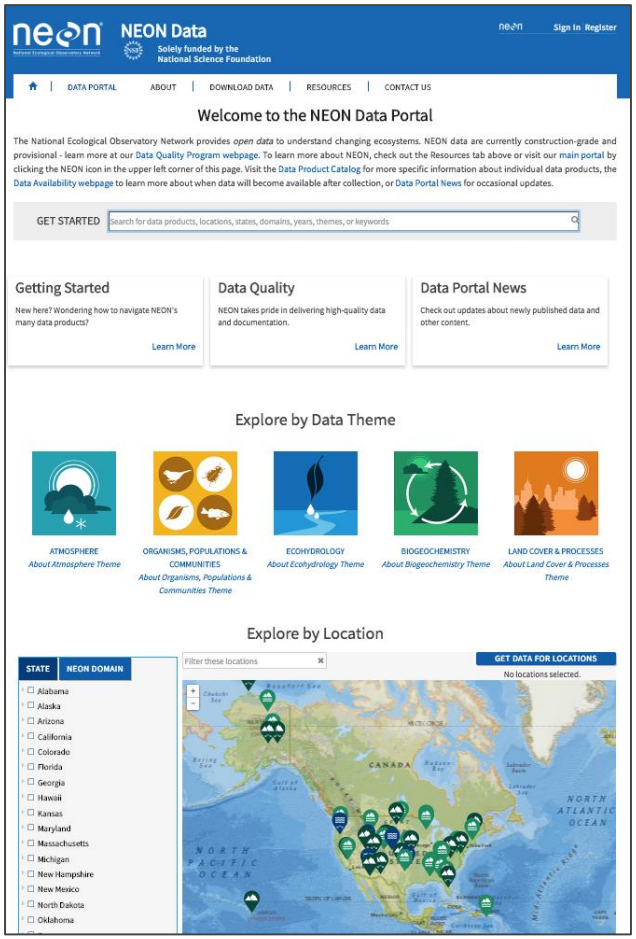


Utqiagvik (Barrow)

Field Operations

- Field operations staff are critical for
  - Collecting all the observational data
  - Care & maintenance with instruments
  - Cooperation with site hosts & local communities

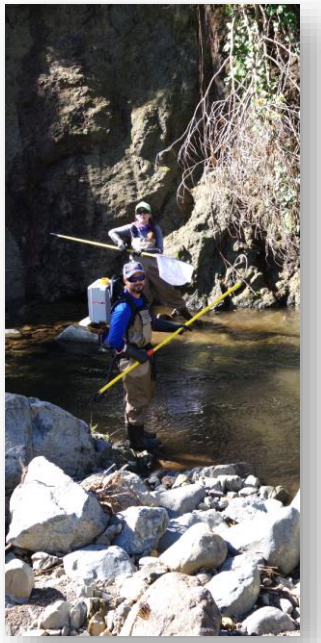
Data portal: data.neonscience.org



- Download data
- View the Data Product Catalog
- API
- Read protocols
- Register a free account

Assignable Assets Program

- **Makes available certain components of NEON's infrastructure to members of the community to support their own research or other activities.**





Assignable Assets Program

- Airborne Observation Program (AOP)
- Mobile Deployment Platforms (MDPs)
- Sensor Infrastructure (SI)
- Observational Sampling Infrastructure (OSI)
- Field Site Access and Coordination (FSAC)
- Letters of Support/Collaboration

Learn & Experience

Operated by Battelle

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