

Types Of Data Collected At Terrestrial And Aquatic Field Sites

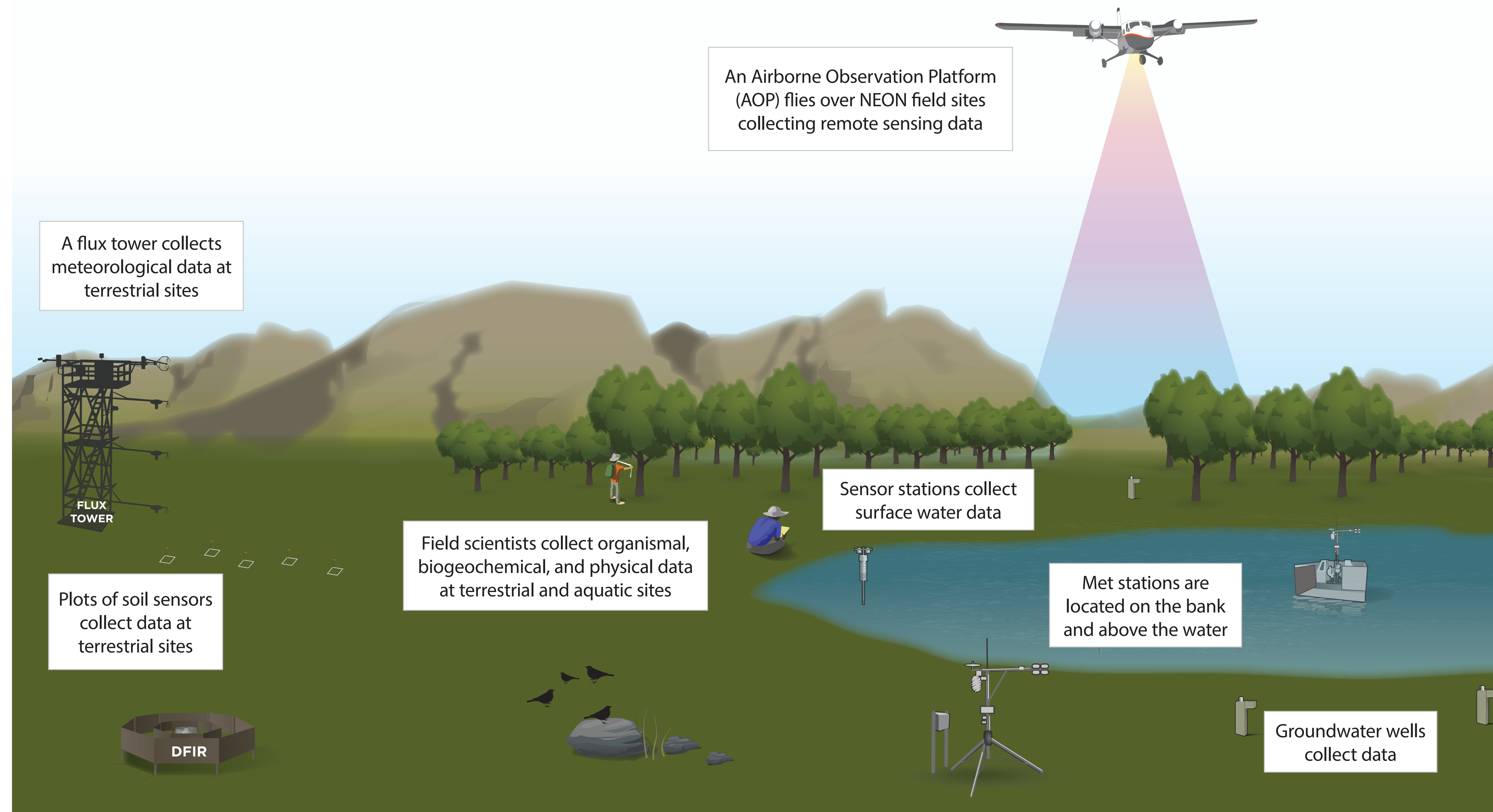
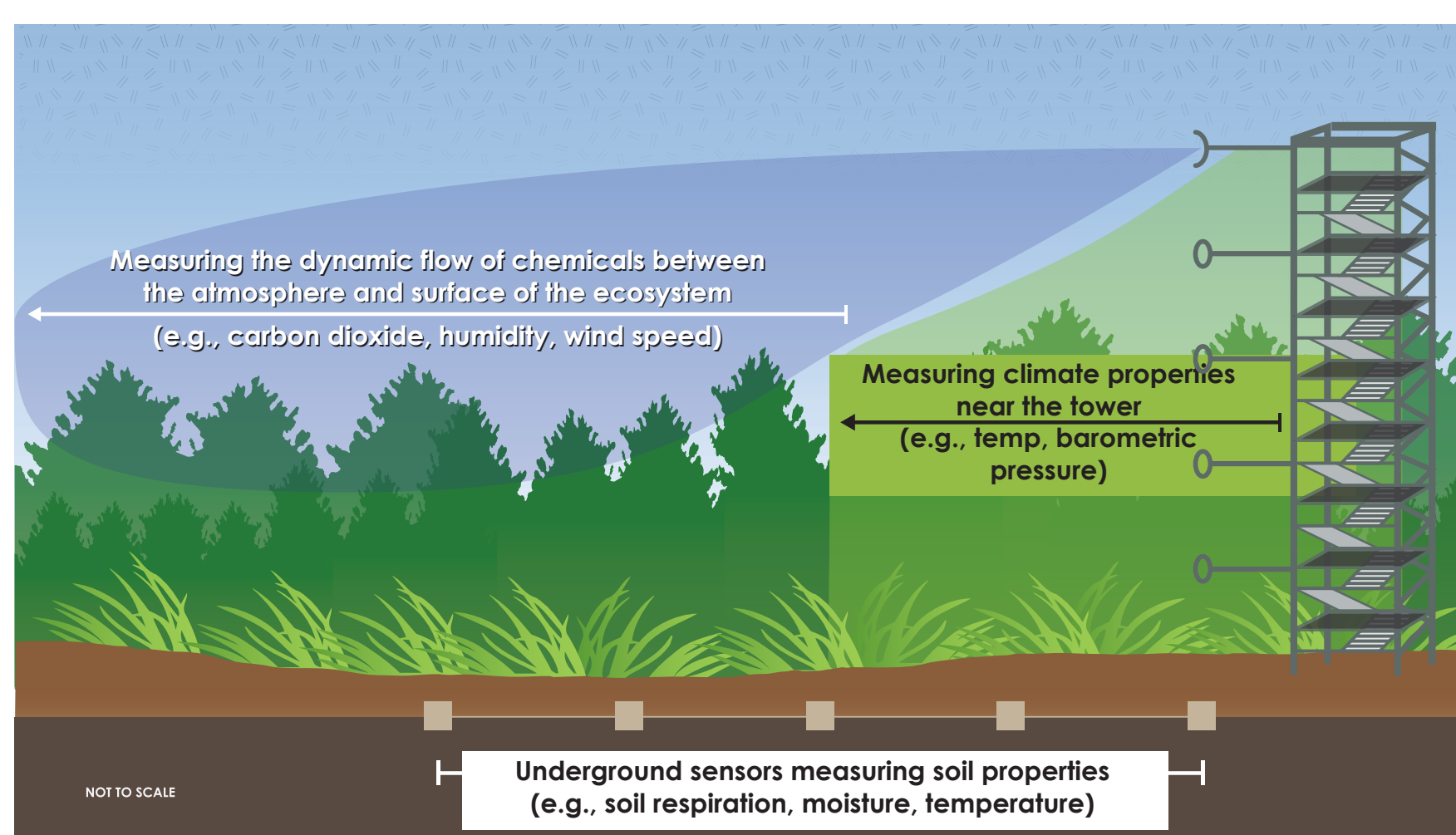


Fig. 1: METEOROLOGICAL MEASUREMENTS AT TERRESTRIAL AND AQUATIC SITES

Measurement	TERRESTRIAL SITES (frequency/location)			AQUATIC SITES (frequency/location)	
	Tower Top	Lower Levels	Soil Array	On Bank Met Station	Above Water Met Station
Global shortwave radiation	1 Hz (only core sites)	☉	☉	☉	☉
Direct and diffuse shortwave radiation	1 Hz	☉	☉	☉	☉
Net-shortwave and net-longwave radiation (4-component)	1 Hz	☉	1 Hz (only longwave)	1 Hz	30 s
Photosynthetically Active Radiation (PAR)	1 Hz	1 Hz	☉	1 Hz	30 s
Photosynthetically Active Radiation (PAR) - quantum line	☉	☉	1 Hz	☉	☉
Spectral sun photometer - calibrated sky radiances	15 min	☉	☉	☉	☉
Air temperature	1 Hz	1 Hz	☉	1 Hz	1 min
IR biological temperature	☉	1 Hz	1 Hz	☉	☉
Relative humidity	1 Hz	☉	1 Hz	1 Hz	1 min
Barometric pressure	☉	1 Hz	☉	1 Hz	1 min
Precipitation/Primary - Double Fence Intercomparison Reference (DFIR)	0.1 Hz (20 sites)			0.1 Hz (four sites)	
Precipitation/Secondary	On event (37 sites)	☉	☉	On event (six sites)	☉
Precipitation/Throughfall	☉	☉	When event occurs	☉	☉
2D wind speed and direction	☉	1 Hz	☉	1 Hz	~4 s
3D wind speed, direction and sonic temperature	20 Hz	☉	☉	☉	☉
3D wind attitude and motion reference	40 Hz	☉	☉	☉	☉
CO ₂ and H ₂ O concentration & flux	20 Hz	☉	☉	☉	☉
CO ₂ and H ₂ O concentration (storage/profile)	1 Hz	1 Hz	☉	☉	☉
CO ₂ and H ₂ O atmospheric isotopes (storage/profile)	1 Hz	1 Hz	☉	☉	☉
Wet deposition chemistry and precipitation isotopes	2 wks (37 sites)	☉	☉	2 wks (seven sites)	☉
Phenology images	15 min	15 min	☉	15 min	

Additional measurements only at MOAB, ONAQ, NIWO, RMNP, STER, CPER:
Dust and particulate size distribution: 1 Hz; Particulate mass: 2 wks

Sensors on tower top, lower levels and in the soil array



SOIL PLOT MEASUREMENTS

Measurement	Near Soil Surface	Multiple Depths
Precipitation/Throughfall	On event	☉
Net-longwave radiation	1 Hz	☉
PAR - quantum line	1 Hz	☉
IR biological temperature	1 Hz	☉
Relative humidity	1 Hz	☉
Soil heat flux plate	.1 Hz	☉
Soil CO ₂ concentration	☉	.1 Hz
Soil temperature	☉	.1 Hz
Soil water and salinity	☉	.1 Hz

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The NSF's National Ecological Observatory Network has 47 terrestrial field sites. Locations are representative of terrestrial features and habitats typical of regions across the United States within each NEON domain and near to NEON's 34 freshwater aquatic field sites whenever feasible.

Data Collection Systems at Terrestrial Sites

Automated instruments • Observational Sampling • Airborne Remote Sensing

NEON data products are open access and can be used in conjunction with one another because they're gathered in close proximity to each other at a site. The data are also comparable among field sites so researchers can study connections and patterns across ecosystems, and then develop models to forecast environmental change locally, regionally and at a continental scale.

TERRESTRIAL OBSERVATIONAL SAMPLING

Sampling plots are established within the flux tower airshed, as well as throughout the dominant land cover/vegetation types identified at each field site. All data and archival samples collected are open access.



Soils & Soil Microbes

- Soil physical properties (Distributed initial characterization)
- Soil physical properties (Distributed periodic)
- Soil microbe biomass
- Soil microbe community composition
- Soil microbe group abundances

Terrestrial Plants

- Plant phenology observations
- Plant presence and percent cover
- Digital hemispheric photos of plot vegetation
- Herbaceous clip harvest
- Litterfall and fine woody debris sampling
- Non-herbaceous perennial vegetation structure
- Root sampling (Megapit)
- Root sampling tower plots
- Woody plant vegetation structure
- Coarse downed wood bulk density sampling
- Coarse downed wood log survey

Ticks, Mosquitoes and Ground Beetles

- Ticks sampled using drag cloths
- Mosquitoes sampled from CO₂ traps
- Ground beetles sampled from pitfall traps

Birds & Small Mammals

- Breeding landbird point counts
- Small mammal box trapping

Pathogens

- Rodent-borne pathogen status
- Tick-borne pathogen status
- Mosquito-borne pathogen status

DNA & Meta-Barcode Sequences

- Small mammal DNA barcodes
- Mosquito DNA barcodes
- Ground beetle DNA barcodes
- Soil microbe marker genes
- Soil microbe metagenomes

Biogeochemical

- Soil chemical properties (Distributed initial characterization)
- Soil chemical properties (Distributed periodic)
- Soil inorganic nitrogen pools and transformations
- Soil stable isotopes (Distributed periodic)
- Plant foliar physical and chemical properties
- Plant foliar stable isotopes
- Litter chemical properties
- Litter stable isotopes
- Root chemical properties
- Root stable isotopes

AIRBORNE REMOTE SENSING SURVEYS

A NEON Airborne Observation Platform (AOP) is an array of instruments installed into a light aircraft to collect high resolution remote sensing data.

Collection of AOP data is synchronized with data collected on the ground at each site and takes place at peak greenness for each field site. Instruments include a discrete and waveform lidar, a hyperspectral imaging spectrometer, and a high resolution digital camera. All data are open access.

NEON has three AOPs that are used to capture data over NEON field sites and collect research-specific flight campaign data requested by the community.

