

Derated by Battelle

Open Access Soil, Meteorological, Surface Water and Groundwater Data



Terrestrial Field Sites

NEON collects automated instrument data at 47 terrestrial field sites. Field sites are strategically located in distinct ecoclimatic regions across the United States. See figure 1 to understand meteorological measurements across field sites. See figure 2 to understand the data collected in our soil plots.

Sensors on tower to	o, lower levels and in the soil array				
Measuring the dynamic flow	of chemicals between				
the atmosphere and surfa	ice of the ecosystem				
(e.g., carbon dioxide, hu	midity, wind speed)				
	Measuring climate properties				
	near the tower				
A CONTRACTOR	(e.g., temp, barometric				
and the second	pressure)				
the the show					
a la					
H	Underground sensors measuring soil properties				
	(e.g., soil respiration, moisture, temperature)				

Fig. 2 SOIL SENSORS ARE IN AN ARRAY OF FIVE SOIL PLOTS					
Measurement	Near Soil Surface	Multiple Depths			
Precipitation/Throughfall	On event	\otimes			
Net-longwave radiation	1 Hz	\otimes			
PAR - quantum line	1 Hz	\otimes			
IR biological temperature	1 Hz	\otimes			
Relative humidity	1 Hz	\bigotimes			
Soil heat flux plate	.1 Hz	\otimes			
Soil CO ₂ concentration	\otimes	.1 Hz			
Soil temperature	\otimes	.1 Hz			
Soil water and salinity	\otimes	.1 Hz			

The Airborne Observation Platform (AOP) flies over NEON field sites collecting remote sensing data Met stations collect meteorological data at aquatic sites Plots of soil sensors collect data at terrestrial sites Automated \square sensors collect \square surface water and Field scientists collect organismal, biogeochemical, and groundwater data physical data at terrestrial and aquatic sites at aquatic sites

Fig. 1: METEOROLOGICAL MEASURE	EMENTS AT T	ERREST	RIAL AN	D AQUATI	C SITES	
	TERRE (freque	STRIAL SIT	AQUATIC SITES (frequency/location)			
Measurement	Tower Top	Lower Levels	Soil Array	On Bank Met Station	Above Water Met Station	
Global shortwave radiation	1 Hz (only core sites)	\otimes	\otimes	\otimes	\otimes	
Direct and diffuse shortwave radiation	1 Hz	\otimes	\otimes	\otimes	\otimes	
Net-shortwave and net-longwave radiation (4-component)	1 Hz	\otimes	1 Hz (only longwave)	1 Hz	30 s	
Photosynthetically Active Radiation (PAR)	1 Hz	1 Hz	\otimes	1 Hz	30 s	
Photosynthetically Active Radiation (PAR) - quantum line	\otimes	⊘ 1 Hz		\otimes	\otimes	
Spectral sun photometer - calibrated sky radiances	15 min	\otimes	\otimes	\otimes	\otimes	
Air temperature	1 Hz	1 Hz	\otimes	1 Hz	1 min	
IR biological temperature	\otimes	1 Hz 1		\otimes	\otimes	
Relative humidity	1 Hz	\otimes	1 Hz	1 Hz	1 min	
Barometric pressure	\otimes	1 Hz	\otimes	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)	\otimes	\otimes	On event (six sites)	\otimes	
Precipitation/Throughfall	\otimes	\otimes	When event occurs	\otimes	\otimes	
2D wind speed and direction	\otimes	1 Hz	\otimes	1 Hz	~4 s	
3D wind speed, direction and sonic temperature	20 Hz	\otimes	\otimes	\otimes	\otimes	
3D wind attitude and motion reference	40 Hz	\otimes	\otimes	\otimes	\otimes	
CO ₂ and H ₂ O concentration & flux	20 Hz	\otimes	\otimes	\otimes	\otimes	
CO ₂ and H ₂ O concentration (storage/profile)	1 Hz	1 Hz	\otimes	\otimes	\otimes	
CO_2 and H_2O atmospheric isotopes (storage/profile)	1 Hz	1 Hz	\otimes	\otimes	\otimes	
Wet deposition chemistry and precipitation isotopes	2 wks (37 sites)	\otimes	\otimes	2 wks (seven sites)	\otimes	
Phenology images	15 min	15 min	\otimes	15	5 min	

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







QUICK FACTS ABOUT OUR AUTOMATED INSTRUMENTS

At terrestrial field sites:

- Meteorological and flux data are collected from flux towers have multiple levels of sensors.
- ✓ Five soil plots are placed in an array near the tower.

All data are open access. NEON infrastructure and field staff may also be used for PI-led research projects through the NEON Assignable Assets program.

Aquatic Field Sites

NEON has 34 freshwater aquatic field sites, including 24 wadeable streams, seven lakes, and three non-wadeable rivers. Locations are representative of aquatic features and habitats typical of regions across the United States within each NEON domain (excluding D20: Pacific Tropical) and near to NEON terrestrial field sites whenever feasible. Refer to Fig 3 and 4 to understand where sensor stations are located at aquatic field sites and what data they collect.







	Fig. 4 AUTOMATED INSTRUMENT MEASUREMENTS BY AQUATIC SITE TYPE							
		Streams Rivers		Lakes				
	Automated Instrument Measurements	Upstream	Downstream	Buoy B	Near Bank	Buoy B	Inlet In	Outlet
	PAR at water surface	\	✓	1	\bigcirc	1	\bigcirc	\bigcirc
	PAR below water surface	\otimes	\bigcirc	√	✓	\checkmark	1	1
	Elevation of surface water (pressure transducer based)	1	1	\bigcirc		\bigcirc	1	1
	Temperature in surface water	✓	1	\bigcirc	1	\bigcirc	1	1
	Temperature at specific depth in surface water (depths vary by site)	\otimes	\bigotimes	1	\otimes	1	\otimes	\otimes
	Water quality: specific conductivity, chlorophyll a, dissolved oxygen content, pH, turbidity, and fluorescent dissolved organic matter (fDOM)	✓ (no fDOM)	√	√	\otimes	√	\otimes	\otimes
	Nitrate in surface water	\otimes	1	1	\bigcirc	1	\bigcirc	\otimes
	Groundwater wells: specific conductivity, water temperature, elevation of groundwater	✓ Up to 8 per field site						
Μ	Meteorological measurements: wind speed and direction, air temperature, barometric pressure, relative humidity, shortwave radiation, and photosynthetically active radiation (PAR)	Image: Constraint of the second sec		✓ ne on bank, ne on buoy				

At aquatic field sites:

- Meteorological data are collected on the bank at all aquatic sites above the water at lake and river sites.
- ✓ Surface water and groundwater data are collected.