

NEON Biorepository: Access NEON samples and specimens from across the US

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NEON Biorepository

The National Ecological Observatory Network (NEON) collects and provides free and open data from across the United States. The NEON Biorepository encompasses aquatic and terrestrial samples and specimens collected during sampling at NEON sites, including:

- whole organisms,
- tissues, and
- samples processed for
 - chemistry,
 - disease, and
 - genetics.

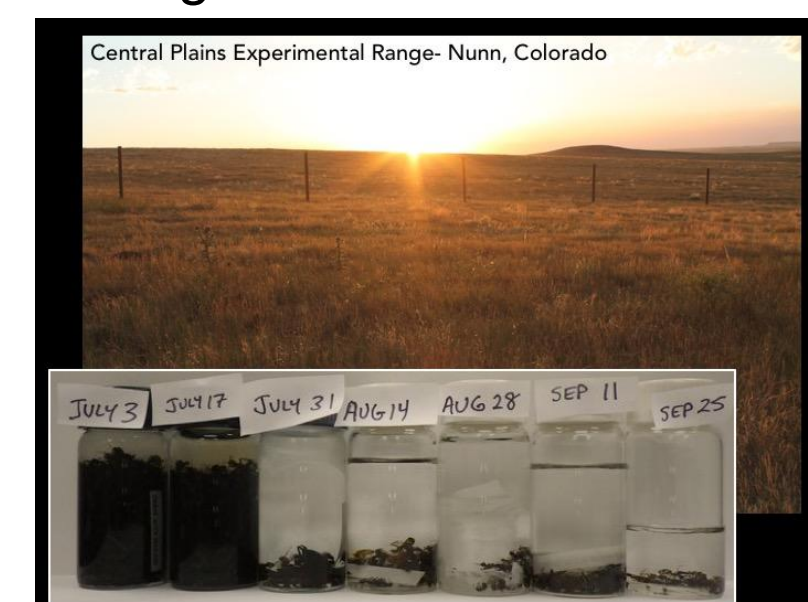
The collected samples provide a rich resource for future research efforts, enabling scientists to identify organisms, analyze archived blood and tissue samples for viruses and other pathogens, and perform new isotopic, biogeochemical and microbial analyses on water and soil samples.

The NEON Biorepository is unique among natural history collections as a result of its diversity of sample types collected consistently across spatial and temporal scales. It is intended to provide a record of samples of known provenance linked to contextual metadata that can be repeatedly used for verification of field observations, archived for new studies, and the application of new analytical techniques and technologies.



NEON Ants: A Case Study

Michael D. Weiser and Michael Kaspari, both of the University of Oklahoma, requested the ants caught as bycatch in the beetle pit fall traps to use with their large scale project on “20-year dynamics of North American ant communities: Evaluating the role of climate and biogeochemistry on ecological change.”



Ants are not part of the NEON data collection scheme and this project expands upon the research potential of NEON data and samples by utilizing bycatch from the biorepository.

NEON Sample Catalog

Biological Archival Samples				Genomic Archival Samples				
Name	Site Type	Storage	Volume/Mass	Sample Name	Site Type	Storage	Volume/Mass	
Algae: Periphyton, seston, phytoplankton diatoms	Aquatic Sites	dry	vials (freeze dried)/glass slides (permanent mounts)	Macroinvertebrate genomic homogenates	Aquatic Sites	-80°C/ETOH	2mL cryovial (TBD)	
Algae: Periphyton, seston, phytoplankton soft algae	Aquatic Sites	glutaraldehyde	60mL jar	Zooplankton genomic homogenates	Aquatic Sites	-80°C/ETOH	2mL cryovial (TBD)	
Macroalgae	Aquatic Sites	glutaraldehyde	60mL jar	Fish: DNA extractions	Aquatic Sites	-80°C	96-well plate or 2 mL cryovial	
Aquatic macrophyte vouchers	Aquatic Sites	dry	Herbarium paper	Beetles: DNA extractions	Terrestrial Sites	-80°C	96-well plate or 2 mL cryovial	
Aquatic mosses/lichens/liverworts vouchers	Aquatic Sites	dry	Herbarium envelope	Mosquitoes: DNA extractions	Terrestrial Sites	-80°C	96-well plate or 2 mL cryovial	
Aquatic microbes: benthic	Aquatic Sites	-80°C	Sterivex filters	Small mammals: DNA extractions	Terrestrial Sites	-80°C	96-well plate or 2 mL cryovial	
Aquatic microbes: water	Aquatic Sites	-80°C	Sterivex filters	Soils: DNA extractions	Terrestrial Sites	-80°C	96-well plate	
Macroinvertebrate specimens	Aquatic Sites	ETOH	250mL-1000mL jar	Geological Archival Samples				
Fish voucher specimens	Aquatic Sites	ETOH	Individual/lot	Sample Name	Site Type	Storage	Volume/Mass	Horizons
Fish tissue: fin clip	Aquatic Sites	ETOH	2-10mL vial	Excess soils	Terrestrial Sites	Temporary-monthly; ambient, dry cabinet	Highly variable; <0.3L per core sample	Organic layer; mineral soil to 30 cm
Zooplankton specimens	Aquatic Sites	ETOH	500mL jar	Soils: physical and chemical	Terrestrial Sites	Ambient, glass jars	200g max total mass	Organic/mineral horiz.,
Disease: mosquito pools	Terrestrial Sites	-80°C	96-well plate or cryovial	Wet deposition for chemical analysis	Terrestrial Sites	-4°C	Any remaining sample after 20 mL	N/A
Disease: tick pools	Terrestrial Sites	-80°C	96-well plate or 2 mL cryovial	Wet deposition for isotope analysis	Terrestrial Sites	-18°C	Any remaining sample after 20 mL	N/A
Ground beetle pinned/pointed	Terrestrial Sites	dry	Individual	Particulate mass (PM10)	Terrestrial Sites	Dry	Filter (8"x10")	N/A
Ground beetle pooled	Terrestrial Sites	ETOH	50mL tubes	Mega-pit soil	Terrestrial Sites	Ambient temperature, glass jars	1.2 or 3.6 kg, each horizon	Multiple, up to 2m or bedrock
Ground beetle bycatch in bulk	Terrestrial Sites	ETOH	50mL tubes					
Leaf litter	Terrestrial Sites	dry	20mL vial					
Plant voucher specimens	Terrestrial Sites	dry	Individual					
Plant (biomass)	Terrestrial Sites	dry	20mL vial					
Plant belowground (biomass)	Terrestrial Sites	dry	20mL vial					
Mosquitos bulk	Terrestrial Sites	-80°C	2-15mL cryovial					
Mosquitoes pinned/pointed	Terrestrial Sites	dry	Individual					
Small mammal blood	Terrestrial Sites	-80°C	2 mL cryovial					
Small mammal ear punch	Terrestrial Sites	-80°C	2 mL cryovial					
Small mammal fecal sample	Terrestrial Sites	-80°C	2 mL cryovial					
Small mammal hairs/whiskers	Terrestrial Sites	dry	Sample					
Ticks	Terrestrial Sites	ETOH	2mL vial					
Soil microbes: organic and mineral horizons	Terrestrial Sites	-80°C	2013-2014: 50 ml tubes; 2015 - on: 2 oz. Whirlpaks					

70,000 new specimens and samples every year, for 30 years

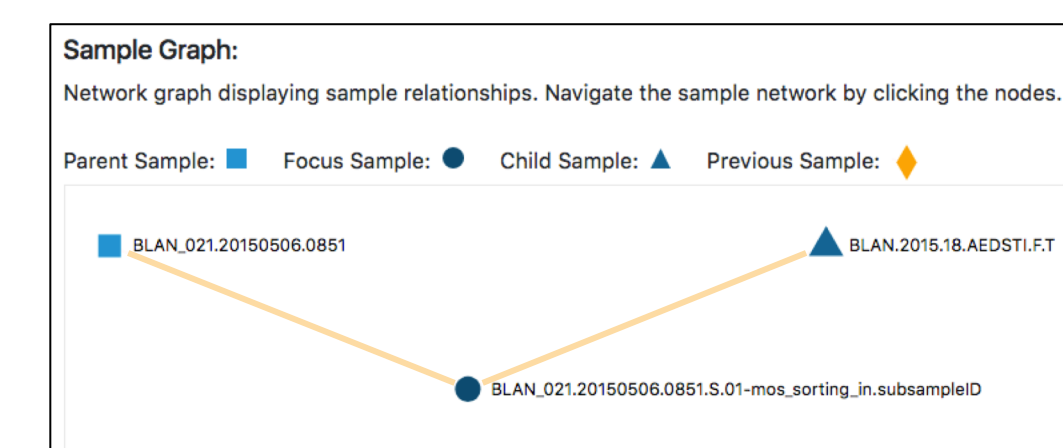


Accessing Specimen Information

Use the NEON Sample Viewer on the NEON Data Portal to find location, condition, and related samples from specimens/samples listed in other NEON data products.

Example: Mosquito collected at Blandy Experimental Farm, VA (Sample Tag: BLAN_021.20150506.0851.S.01).

table	fate date	fate	fate location	sample condition	specimen count
mos_sorting_in	2016-10-26 12:00:00.0	active	Connecticut Agricultural Exp...	OK	n/a
mos_identification_in	2016-10-26 12:00:00.0	processed	Connecticut Agricultural Exp...	OK	1



Request NEON Biorepository Samples



During initial NEON operations, samples and specimens can be requested directly from NEON. Please contact NEON at

neonscience.org/archival-samples-inquiry

Once the complete NEON Biorepository is established, the request procedure will be directly through the host institution(s). The host institution(s) will manage the request and loan process for all samples.