TOS SITE CHARACTERIZATION REPORT: DOMAIN 08

PREPARED BY	ORGANIZATION	DATE
Rachel Krauss	SCI	1/9/2017
Michael Patterson	SCI	1/9/2017
Oliver Smith	SCI	1/9/2017

APPROVALS	ORGANIZATION	APPROVAL DATE
Andrea Thorpe	SCI	3/8/2017
Mike Stewart	SYS	2/22/2017

RELEASED BY	ORGANIZATION	RELEASE DATE
Judy Salazar	CM	3/9/2017

See configuration management system for approval history.

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CHANGE RECORD

REVISION	DATE	ECO#	DESCRIPTION OF CHANGE
A	3/9/2017	ECO-04404	Initial Release

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

1 DESCRIPTION

1.1 Purpose

Domain and site-specific information collected and described here is used to inform the execution of protocols for the NEON Terrestrial Observation System (TOS), and complements the official NEON TOS data products generated from each site. In addition, the TOS spatial layout and plot allocation is described for each site within the domain.

1.2 Scope

This document includes any site specific characterization methods and the results of characterization efforts for each of the three sites in the Ozarks Complex domain. For more information about the sampling methods, reference the TOS Site Characterization Methods Document (RD[06]). The geographic coordinates for all TOS sampling locations can be found in the Reference Documents area of the NEON Data Portal and are provided with TOS data product downloads.

2 RELATED DOCUMENTS AND ACRONYMS

2.1 Applicable Documents

Applicable documents contain information that shall be applied in the current document. Examples are higher level requirements documents, standards, rules and regulations.

AD[01]	NEON.DOC.004300	EHSS Policy, Program, and Management Plan
AD[02]	NEON.DOC.050005	Field Operations Job Instruction Training Plan
AD[03]	NEON.DOC.000909	TOS Science Design for Ground Beetle Abundance and Diversity
AD[04]	NEON.DOC.000910	TOS Science Design for Mosquito Abundance, Diversity and Phenology
AD[05]	NEON.DOC. 000912	TOS Science Design for Plant Diversity
AD[06]	NEON.DOC.000915	TOS Science Design for Small Mammal Abundance and Diversity
AD[07]	NEON.DOC.000914	TOS Science Design for Plant Biomass, Productivity, and Leaf Area Index
AD[08]	NEON.DOC.000001	NEON Observatory Design

2.2 Reference Documents

Reference documents contain information complementing, explaining, detailing, or otherwise supporting the information included in the current document.

RD[01]	NEON.DOC.000008	NEON Acronym List
RD[02]	NEON.DOC.000243	NEON Glossary of Terms
RD[03]	NEON.DOC.000913	TOS Science Design for Spatial Sampling
RD[04]	NEON.DOC.011038	TIS Site Characterization Report
RD[05]	NEON.DOC.001370	AIS Site Characterization Report
RD[06]	NEON.DOC.003885	TOS Site Characterization Methods
RD[07]	NEON.DOC.000481	TOS Protocol and Procedure: Small Mammal Sampling
RD[08]	NEON.DOC.014041	TOS Protocol and Procedure: Breeding Landbird Abundance and Diversity

2.3 Acronyms

Acronym	Definition
BOLD	Barcode of Life Datasystems
NLCD	National Land Cover Database

3 DOMAIN 08 OVERVIEW: OZARKS COMPLEX DOMAIN

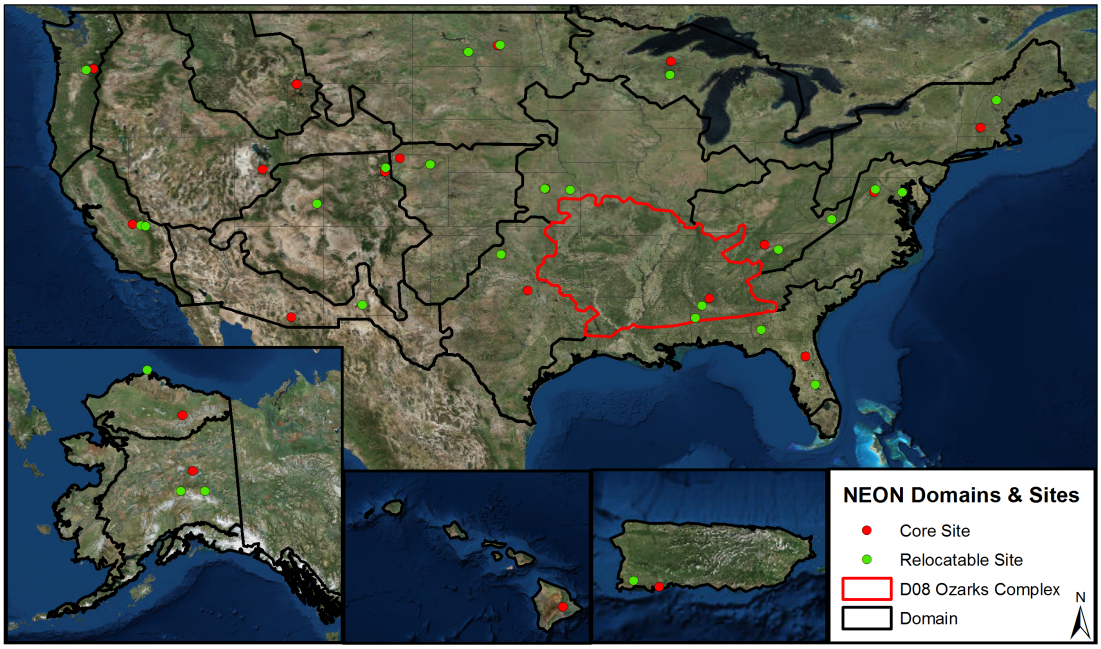

Figure 1: NEON project map with Domain 08 highlighted in red.

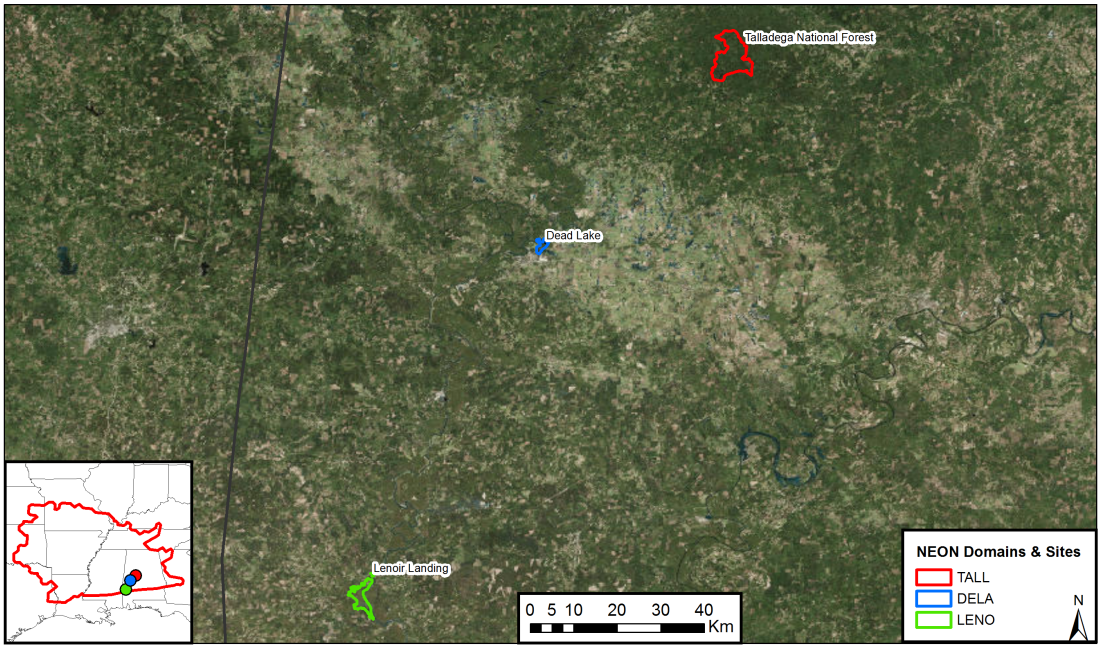

Figure 2: Site boundaries within Domain 08.

Domain eight is a mosaic of wetlands and forests located within the Mobile River Basin which is the sixth largest basin in the country and the fourth largest in terms of stream flow (National Water Quality Assessment Program, 2013). All three TOS sites are paired with aquatic sites to allow for linkages to be studied between terrestiral and aquatic systems.

- States included in the domain: Alabama, Arkansas, Georgia, Illinois, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, Tennessee, Texas
- Core site: Talladega National Forest
- Relocatable 1: Dead Lake
- Relocatable 2: Lenoir Landing
- Science themes: Climate Impacts

4 CORE SITE- TALLADEGA NATIONAL FOREST (TALL)

The Talladega National Forest site covers 53 km^2 within the larger Oakmulgee District of the Talladega National Forest in west-central Alabama.

Key Characteristics:

- Site host: U.S. Forest Service
- Located in: Hale and Bibb counties, Alabama
- Area: 53 km^2
- Elevation: 60-180 m
- Dominant vegetation type: Talladega's canopy is dominated by longleaf pine (*Pinus palustris*), loblolly pine (*Pinus taeda*), and slash pine (*Pinus elliottii*). The site also includes a mixture of hardwoods and wetlands.
- General management: Management includes logging, longleaf pine restoration, and restoring the natural fire regime.
- Mayfield Creek is a steam within Talladega forest. See the AIS site characterization report for more details (RD[05]).
- Plot Selection: NEON TOS Plots were allocated across the site following NEON standard criteria and avoiding existing research.

4.1 TOS Spatial Sampling Design

TOS plots were allocated at TALL according to a spatially balanced and stratified-random design (RD[3]). The 2006 National Land Cover Database (NLCD) was selected for stratification because of the consistent and comparable data availability across the United States. The maps below depict the plot locations for the first year of NEON sampling. Some plot locations may change over time due to logistics, safety, and science requirements. Please visit the NEON website (http://www.neonscience.org) for updated plot locations at each site.

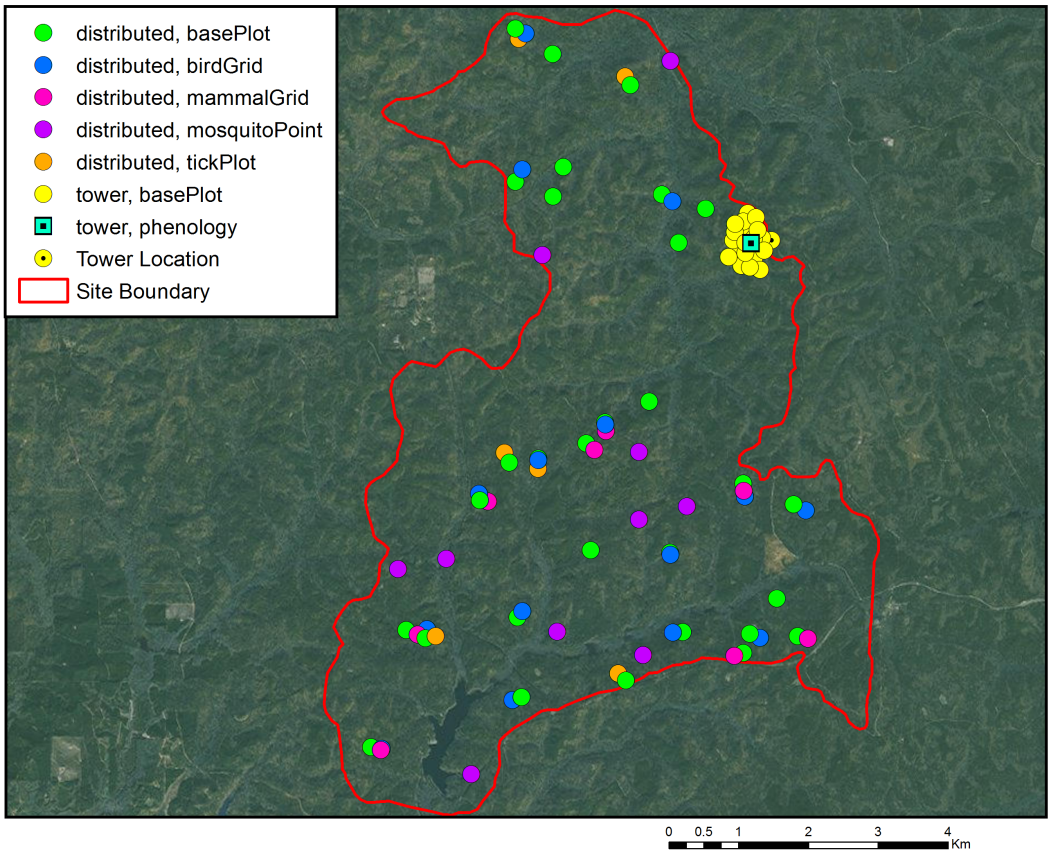

Figure 3: Map of TOS plot centroids within the NEON TOS sampling boundary at TALL.

For a list of protocols associated with each plot see tables below; for additional spatial design information see RD[03].

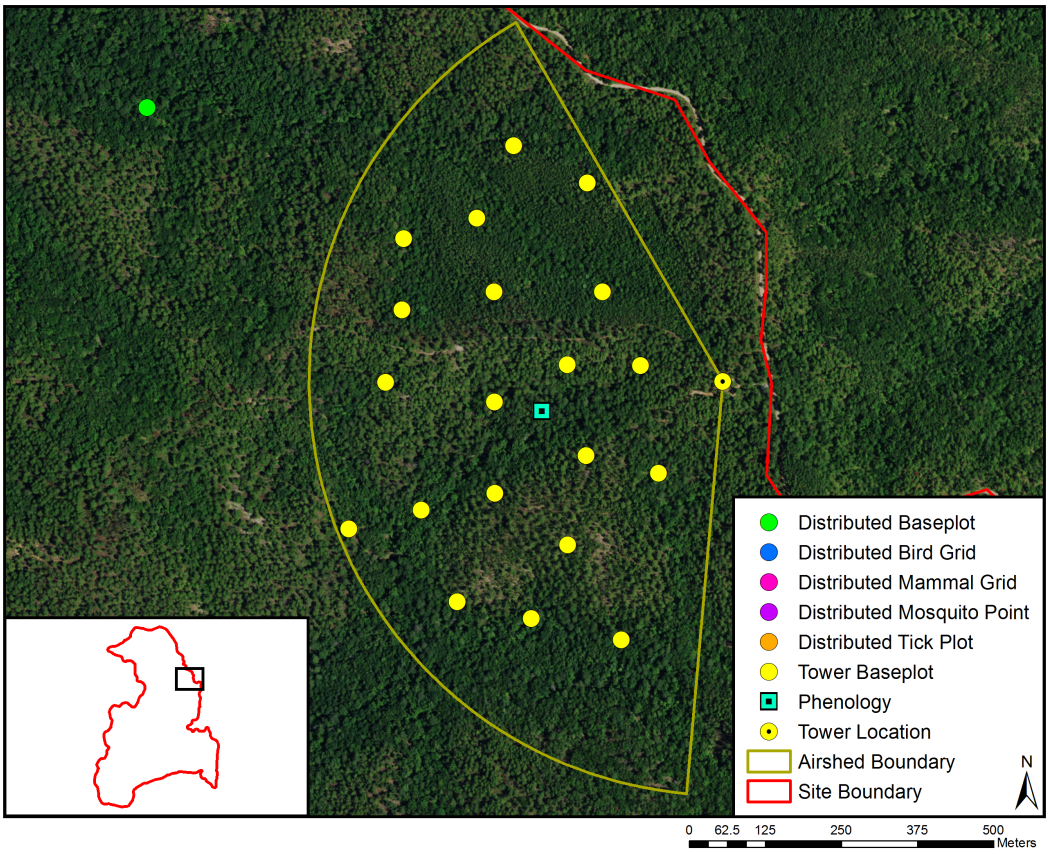

Figure 4: Map of the tower airshed and TOS plot centroids at TALL.

More information about the tower airshed can be found in the FIU site characterization report (RD[04]).

Table 1: NLCD land cover classes and area within the TOS site boundary at TALL.

NLCD Class	Site Area (km^2)	Percent (%)
Evergreen Forest	18.25	34.86
Deciduous Forest	16.61	31.74
Mixed Forest	13.8	26.37
Woody Wetlands	2.17	4.14
Open Water	0.55	1.05
Developed Open Space	0.55	1.05
Shrub Scrub	0.42	0.8

Note: Any NLCD land cover classes less than 5% will not be sampled. Additionally, no sampling will take place in Water, Developed, or Barren Land NLCD classes.

Table 2: NLCD land cover classes and TOS plot numbers at TALL.

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Base Plot	Deciduous Forest	10
Distributed	Base Plot	Evergreen Forest	10
Distributed	Base Plot	Mixed Forest	10
Distributed	Bird Grid	Deciduous Forest	5
Distributed	Bird Grid	Evergreen Forest	5
Distributed	Bird Grid	Mixed Forest	5
Distributed	Mammal Grid	Deciduous Forest	3
Distributed	Mammal Grid	Evergreen Forest	3
Distributed	Mammal Grid	Mixed Forest	2
Distributed	Mosquito Point	Deciduous Forest	3
Distributed	Mosquito Point	Evergreen Forest	4
Distributed	Mosquito Point	Mixed Forest	3
Distributed	Tick Plot	Deciduous Forest	2
Distributed	Tick Plot	Evergreen Forest	2
Distributed	Tick Plot	Mixed Forest	2
Tower	Base Plot	NA	20
Tower	phenology	NA	1

Note: NLCD land cover classes are not used to stratify Tower Plots.

Table 3: Number of Distributed Base Plots per NLCD land cover class per protocol at TALL.

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Deciduous Forest	Beetles	3
Distributed	Base Plot	Evergreen Forest	Beetles	4
Distributed	Base Plot	Mixed Forest	Beetles	3
Distributed	Base Plot	Deciduous Forest	Canopy Foliage Chemistry	2
Distributed	Base Plot	Evergreen Forest	Canopy Foliage Chemistry	2
Distributed	Base Plot	Mixed Forest	Canopy Foliage Chemistry	2
Distributed	Base Plot	Deciduous Forest	Coarse Downed Wood	7
Distributed	Base Plot	Evergreen Forest	Coarse Downed Wood	7
Distributed	Base Plot	Mixed Forest	Coarse Downed Wood	6
Distributed	Base Plot	Deciduous Forest	Digital Hemispherical Photos for Leaf Area Index	7

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Evergreen Forest	Digital Hemispherical Photos for Leaf Area Index	7
Distributed	Base Plot	Mixed Forest	Digital Hemispherical Photos for Leaf Area Index	6
Distributed	Base Plot	Deciduous Forest	Herbaceous Biomass	7
Distributed	Base Plot	Evergreen Forest	Herbaceous Biomass	7
Distributed	Base Plot	Mixed Forest	Herbaceous Biomass	6
Distributed	Base Plot	Deciduous Forest	Plant Diversity	10
Distributed	Base Plot	Evergreen Forest	Plant Diversity	10
Distributed	Base Plot	Mixed Forest	Plant Diversity	10
Distributed	Base Plot	Deciduous Forest	Soil Biogeochemistry	2
Distributed	Base Plot	Evergreen Forest	Soil Biogeochemistry	2
Distributed	Base Plot	Mixed Forest	Soil Biogeochemistry	2
Distributed	Base Plot	Deciduous Forest	Soil Microbes	2
Distributed	Base Plot	Evergreen Forest	Soil Microbes	2
Distributed	Base Plot	Mixed Forest	Soil Microbes	2
Distributed	Base Plot	Deciduous Forest	Vegetation Structure	7
Distributed	Base Plot	Evergreen Forest	Vegetation Structure	7
Distributed	Base Plot	Mixed Forest	Vegetation Structure	6

Note: Distributed Base Plots typically support more than one TOS protocol; 'Number of Plots' cannot be added to get total TOS Distributed Base Plot number.

Table 4: Number of Tower Plots per protocol at TALL.

Plot Type	Plot Subtype	Protocols	Number of Plots
Tower	Base Plot	Below Ground Biomass Coring	20
Tower	Base Plot	Canopy Foliage Chemistry	4
Tower	Base Plot	Coarse Downed Wood	20
Tower	Base Plot	Digital Hemispherical Photos for Leaf Area Index	20
Tower	Base Plot	Herbaceous Biomass	20
Tower	Base Plot	Litterfall and Fine Woody Debris	20
Tower	Base Plot	Plant Diversity	3
Tower	Base Plot	Soil Biogeochemistry	4
Tower	Base Plot	Soil Microbes	4
Tower	Base Plot	Vegetation Structure	20

Plot Type	Plot Subtype	Protocols	Number of Plots
Tower	Phenology	Plant Phenology	1

Note: Tower Base Plots typically support more than one TOS protocol; 'Number of Plots' cannot be added to get the total TOS Tower Base Plot number.

4.2 Belowground Biomass

4.2.1 Site-Specific Methods

Belowground biomass characterization data were collected down to a depth of 200 cm by NEON staff in January 2014. Since the NEON protocol for long-term, operational sampling of belowground biomass only collects data to a depth of 30 cm, the belowground biomass site characterization data are critical for scaling belowground biomass measurements to greater depths; see the TOS Science Design for Plant Biomass, Productivity, and Leaf Area Index (AD[7]) for more information. Samples were collected following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Roots were sorted to two diameter size categories ($\leq$ 2 mm and 2-30 mm) and by root status (live or dead). The tables below summarize all the belowground biomass less than or equal to 30 mm diameter; size class data and more information can be found by searching the NEON data portal for the data product numbers in Appendix A.

4.2.2 Results

Table 5: Fine root mass per depth increment (cm) at TALL.

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
0	10	2.85	0.57
10	20	1.4	0.51
20	30	2.53	2.29
30	40	3.05	3.27
40	50	1.61	0.91
50	60	0.57	0.18
60	70	0.23	0.12
70	80	0.04	0.03
80	90	0.08	0.08
90	100	0.08	0.06
100	120	0.02	0.02
120	140	0	0
140	160	0.02	0.03

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
160	180	0	0
180	200	0	0

Table 6: Cumulative fine root mass as a function of depth (cm) at TALL.

Upper Depth	Lower Depth	Mean Cumulative (g per m^2)	Cumulative Std Dev
0	10	285.09	57.04
10	20	425.4	107.68
20	30	678.12	257.45
30	40	983.01	535.07
40	50	1143.97	624.15
50	60	1200.74	638.22
60	70	1223.3	627.14
70	80	1227.7	624.43
80	90	1236	618.82
90	100	1244.3	622.06
100	120	1247.93	622.33
120	140	1248.62	621.9
140	160	1252.51	620.02
160	180	1252.86	620.14
180	200	1252.98	620.26

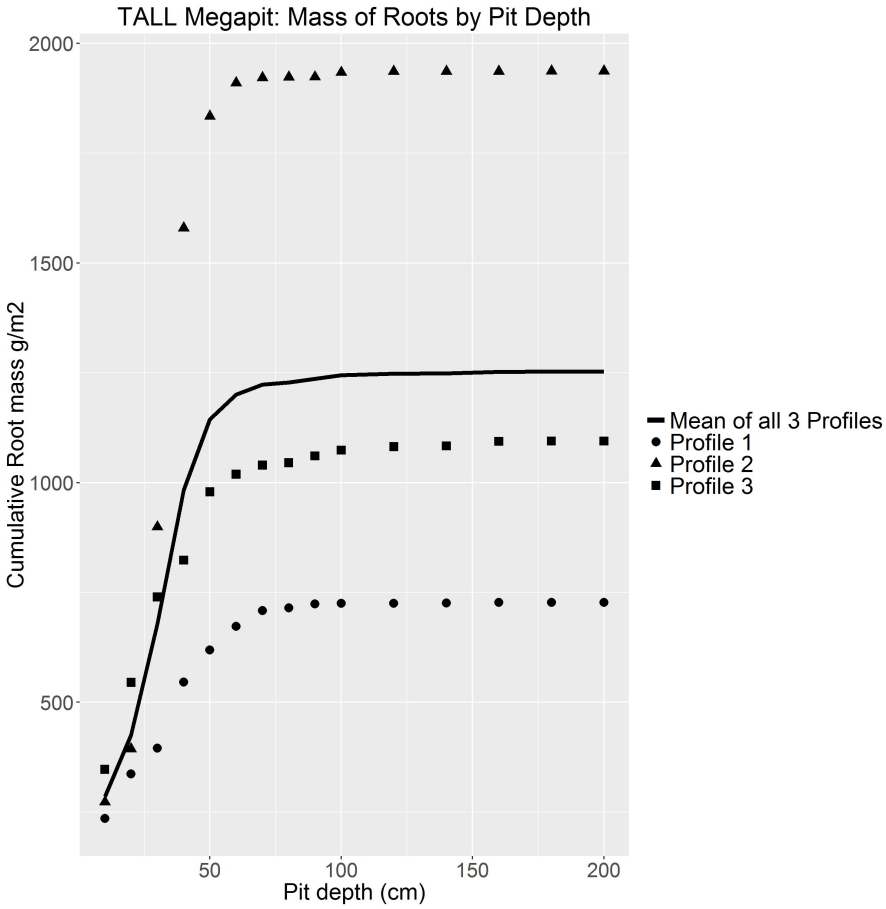

Figure 5: Cumulative root mass by pit depth at TALL.

Table 7: Fine root biomass sampling summary data at TALL.

Total Pit Depth (cm)	200
Total Cumulative Mass at 30cm (g per m^2)	678.12
Total Cumulative Mass at 100cm (g per m^2)	1244.3
Total Cumulative Mass (g per m^2)	1252.98

4.3 Plant Characterization and Phenology Species Selection

4.3.1 Site-Specific Methods

Plant characterization data were collected by an external contractor during September of 2013 following the standard methods outlined in TOS Site Characterization Methods (RD[6]). For more information on this protocol and data product numbers see Appendix A.

4.3.2 Results

Table 8: Site plant characterization and phenology species summary at TALL.

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
VAAR	*Vaccinium arboreum* Marshall	1	12	NA	NA
PIPA2	*Pinus palustris* Mill.	2	4	NA	8.31
ARGI	*Arundinaria gigantea* (Walter) Muhl.	3	8	NA	NA
PITA	*Pinus taeda* L.	4	1	NA	6.31
GESE	*Gelsemium sempervirens* (L.) W.T. Aiton	5	6	NA	NA
OXAR	*Oxydendrum arboreum* (L.) DC.	6	6	NA	0.22
VIRO3	*Vitis rotundifolia* Michx.	7	6	NA	NA
RHCO	*Rhus copallinum* L.	8	5	NA	NA
COFL2	*Cornus florida* L.	9	4	NA	0.11
LIST2	*Liquidambar styraciflua* L.	10	3	NA	1.15
PTAQ	*Pteridium aquilinum* (L.) Kuhn	11	4	NA	NA
SCSC	*Schizachyrium scoparium* (Michx.) Nash	12	3	NA	NA
QUAL	*Quercus alba* L.	13	<1	NA	1.33
QUFA	*Quercus falcata* Michx.	14	<1	NA	1.1
ACRU	*Acer rubrum* L.	15	1	NA	0.16
LITU	*Liriodendron tulipifera* L.	16	<1	NA	1.5
QUVE	*Quercus velutina* Lam.	17	<1	NA	0.33
NYBI	*Nyssa biflora* Walter	18	<1	NA	1.24
QUNI	*Quercus nigra* L.	19	<1	NA	0.21
CAGL8	*Carya glabra* (Mill.) Sweet	20	<1	NA	NA
DIFR6	*Ditrysinia fruticosa* (W. Bartram) Govaerts & Frodin	21	<1	NA	NA
POAC4	*Polystichum acrostichoides* (Michx.) Schott	22	<1	NA	NA

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
QUCO2	*Quercus coccinea* Münchh.	23	<1	NA	0.41
SYTI	*Symplocos tinctoria* (L.) L'Hér.	24	<1	NA	NA
OSCI	*Osmunda cinnamomea* L.	25	<1	NA	NA
QUMA6	*Quercus margarettae* (Ashe) Small	26	<1	NA	NA
SMRO	*Smilax rotundifolia* L.	27	<1	NA	NA
CAAL27	*Carya tomentosa* (Lam.) Nutt.	28	<1	NA	0.11
HAVI4	*Hamamelis virginiana* L.	29	<1	NA	NA
NYSY	*Nyssa sylvatica* Marshall	30	<1	NA	0.42
DIVI5	*Diospyros virginiana* L.	31	<1	NA	NA
CAAM2	*Callicarpa americana* L.	32	<1	NA	NA
QURU	*Quercus rubra* L.	33	<1	NA	NA
MAVI2	*Magnolia virginiana* L.	34	NA	NA	0.5
QUMA3	*Quercus marilandica* Münchh.	35	<1	NA	NA
CHLA6	*Chasmanthium laxum* (L.) Yates	36	<1	NA	NA
MOCE2	*Morella cerifera* (L.) Small	37	<1	NA	NA
VAST	*Vaccinium stamineum* L.	38	<1	NA	NA
DIBO2	*Dichanthelium boscii* (Poir.) Gould & C.A. Clark	39	<1	NA	NA
CHSE2	*Chasmanthium sessiliflorum* (Poir.) Yates	40	<1	NA	NA
DICO2	*Dichanthelium commutatum* (Schult.) Gould	40	<1	NA	NA
CAPA24	*Carya pallida* (Ashe) Engl. & Graebn.	42	<1	NA	0.02
TEVI	*Tephrosia virginiana* (L.) Pers.	43	<1	NA	NA
VAEL	*Vaccinium elliottii* Chapm.	44	<1	NA	NA

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
SAAL5	*Sassafras albidum* (Nutt.) Nees	45	<1	NA	NA
QUST	*Quercus stellata* Wangenh.	46	<1	NA	0.16
SMGL	*Smilax glauca* Walter	47	<1	NA	NA
AEPA	*Aesculus pavia* L.	48	<1	NA	NA
WOAR	*Woodwardia areolata* (L.) T. Moore	49	<1	NA	NA
VAPA4	*Vaccinium pallidum* Aiton	50	<1	NA	NA
SAAL21	*Saccharum alopecuroides* (L.) Nutt.	51	<1	NA	NA
SYDU2	*Symphyotrichum dumosum* (L.) G.L. Nesom	51	<1	NA	NA
ASPA18	*Asimina parviflora* (Michx.) Dunal	53	<1	NA	NA
VAFU	*Vaccinium fuscatum* Aiton	54	<1	NA	NA
PIVI2	*Pinus virginiana* Mill.	55	NA	NA	0.18
CLMA4	*Clitoria mariana* L.	56	<1	NA	NA
DILA9	*Dichanthelium laxiflorum* (Lam.) Gould	56	<1	NA	NA
PIEC2	*Pinus echinata* Mill.	58	NA	NA	0.17
SMBO2	*Smilax bona-nox* L.	59	<1	NA	NA
RUFL	*Rubus flagellaris* Willd.	60	<1	NA	NA
SOAR	*Solidago arguta* Aiton	60	<1	NA	NA
ITVI	*Itea virginica* L.	62	<1	NA	NA
EUPU7	*Euphorbia pubentissima* Michx.	63	<1	NA	NA
MIRE	*Mitchella repens* L.	63	<1	NA	NA
COMA6	*Coreopsis major* Walter	65	<1	NA	NA
CANI3	*Carex nigromarginata* Schwein.	66	<1	NA	NA
STGR4	*Styrax grandifolius* Aiton	67	<1	NA	NA
ILOP	*Ilex opaca* Aiton	68	<1	NA	0.03
RHCA7	*Rhododendron canescens* (Michx.) Sweet	70	<1	NA	NA

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
SEPE2	*Seymeria pectinata* Pursh	71	<1	NA	NA
CAOD3	*Carphephorus odoratissimus* (J.F. Gmel.) Herb.	72	<1	NA	NA
SCINA	*Scutellaria incana* Biehler var. *australis* (Epling) Collins, ined.	73	<1	NA	NA
TORA2	*Toxicodendron radicans* (L.) Kuntze	74	<1	NA	NA
HYHY	*Hypericum hypericoides* (L.) Crantz	75	<1	NA	NA
ELEL3	*Elephantopus elatus* Bertol.	76	<1	NA	NA
SOOD	*Solidago odora* Aiton	76	<1	NA	NA
CAGL5	*Carex glaucescens* Elliott	78	<1	NA	NA
SETO7	*Sericocarpus tortifolius* (Michx.) Nees	78	<1	NA	NA
BESC	*Berchemia scandens* (Hill) K. Koch	80	<1	NA	NA
DEBA4	*Decumaria barbara* L.	80	<1	NA	NA
DECI	*Desmodium ciliare* (Muhl. ex Willd.) DC.	80	<1	NA	NA
TRSM	*Tragia smallii* Shinners	80	<1	NA	NA
DIDI6	*Dichanthelium dichotomum* (L.) Gould	84	<1	NA	NA
TRUR	*Tragia urens* L.	84	<1	NA	NA
AGAR4	*Ageratina aromatica* (L.) Spach	86	<1	NA	NA
AUPE	*Aureolaria pectinata* (Nutt.) Pennell	86	<1	NA	NA
CEVI2	*Centrosema virginianum* (L.) Benth.	86	<1	NA	NA
GADU	*Gaylussacia dumosa* (Andrews) Torr. & A. Gray	86	<1	NA	NA
GAPI2	*Galium pilosum* Aiton	86	<1	NA	NA

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
GYAM	*Gymnopogon ambiguus* (Michx.) Britton, Sterns & Poggenb.	86	<1	NA	NA
HIGR3	*Hieracium gronovii* L.	86	<1	NA	NA
IPPA	*Ipomoea pandurata* (L.) G. Mey.	86	<1	NA	NA
PAQU2	*Parthenocissus quinquefolia* (L.) Planch.	86	<1	NA	NA
PRENA	*Prenanthes* sp.	86	<1	NA	NA
SILY	*Sideroxylon lycioides* L.	86	<1	NA	NA
VIAE	*Vitis aestivalis* Michx.	86	<1	NA	NA
YUFI	*Yucca filamentosa* L.	86	<1	NA	NA
JUVI	*Juniperus virginiana* L.	99	NA	NA	0.02
AGTE3	*Agalinis tenuifolia* (Vahl) Raf.	100	<1	NA	NA
ARSE3	*Aristolochia serpentaria* L.	100	<1	NA	NA
BOBI	*Botrychium biternatum* (Sav.) Underw.	100	<1	NA	NA
CNURS	*Cnidoscolus urens* (L.) Arthur var. *stimulosus* (Michx.) Govaerts	100	<1	NA	NA
DEVI4	*Desmodium viridiflorum* (L.) DC.	100	<1	NA	NA
DIAC2	*Dichanthelium acuminatum* (Sw.) Gould & C.A. Clark	100	<1	NA	NA
EUAL2	*Eupatorium album* L.	100	<1	NA	NA
EUPAT	*Eupatorium* sp.	100	<1	NA	NA
HEDI2	*Helianthus divaricatus* L.	100	<1	NA	NA
LERE2	*Lespedeza repens* (L.) W.P.C. Barton	100	<1	NA	NA
PALA10	*Paspalum laeve* Michx.	100	<1	NA	NA
SMLA	*Smilax laurifolia* L.	100	<1	NA	NA
SOCA4	*Solidago caesia* L.	100	<1	NA	NA

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
STBI2	*Stylosanthes biflora* (L.) Britton, Sterns & Poggenb.	100	<1	NA	NA
STPA8	*Stylisma patens* (Desr.) Myint	100	<1	NA	NA
SYPA11	*Symphyotrichum patens* (Aiton) G.L. Nesom	100	<1	NA	NA
TRUR2	*Tragia urticifolia* Michx.	100	<1	NA	NA
VEAN	*Vernonia angustifolia* Michx.	100	<1	NA	NA
VINU	*Viburnum nudum* L.	100	<1	NA	NA
ARAT	*Arnoglossum atriplicifolium* (L.) H. Rob.	119	<1	NA	NA
ATFI	*Athyrium filix-femina* (L.) Roth	119	<1	NA	NA
CAREX	*Carex* sp.	119	<1	NA	NA
CHVI3	*Chionanthus virginicus* L.	119	<1	NA	NA
CRSA4	*Crotalaria sagittalis* L.	119	<1	NA	NA
DEPA6	*Desmodium paniculatum* (L.) DC.	119	<1	NA	NA
DEPE80	*Desmodium perplexum* B.G. Schub.	119	<1	NA	NA
DIOV	*Dichanthelium ovale* (Elliott) Gould & C.A. Clark	119	<1	NA	NA
DIVI4	*Dioscorea villosa* L.	119	<1	NA	NA
EURO4	*Eupatorium rotundifolium* L.	119	<1	NA	NA
GARE2	*Galactia regularis* (L.) Britton, Sterns & Poggenb.	119	<1	NA	NA
GEVI5	*Gentiana villosa* L.	119	<1	NA	NA
HEAR6	*Hexastylis arifolia* (Michx.) Small	119	<1	NA	NA
HEMI3	*Helianthus microcephalus* Torr. & A. Gray	119	<1	NA	NA
HYQU3	*Hydrangea quercifolia* W. Bartram	119	<1	NA	NA

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
LIMET	*Linum medium* (Planch.) Britton var. *texanum* (Planch.) Fernald	119	<1	NA	NA
MARA7	*Maianthemum racemosum* (L.) Link	119	<1	NA	NA
MOCA7	*Morella caroliniensis* (Mill.) Small	119	<1	NA	NA
OXDI2	*Oxalis dillenii* Jacq.	119	<1	NA	NA
PHPY4	*Photinia pyrifolia* (Lam.) K.R. Robertson & Phipps	119	<1	NA	NA
PIGR4	*Pityopsis graminifolia* (Michx.) Nutt.	119	<1	NA	NA
RUCA4	*Ruellia caroliniensis* (J.F. Gmel.) Steud.	119	<1	NA	NA
SCOL2	*Scleria oligantha* Michx.	119	<1	NA	NA
SYLA4	*Symphyotrichum lateriflorum* (L.) Á. Löve & D. Löve	119	<1	NA	NA
SYUN	*Symphyotrichum undulatum* (L.) G.L. Nesom	119	<1	NA	NA
TOPU2	*Toxicodendron pubescens* Mill.	119	<1	NA	NA
RHGL	*Rhus glabra* L.	145	<1	NA	NA

Note: Mean canopy area is collected for shrubs. Mean area at breast height (ABH) is collected for trees. Taxon IDs and scientific names are based on the USDA Plants database (plants.usda.gov).

Table 9: Per plot breakdown of species richness, diversity, and herbaceous cover at TALL.

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover
230445	15	1.94	54
6445	22	2.51	73
TALL_042	22	2.03	88
TALL_043	20	2.53	60
TALL_044	15	2.28	76
TALL_045	32	2.5	142

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover
TALL_046	24	2.31	65
TALL_047	34	2.98	116
TALL_048	17	2.44	71
TALL_049	21	2.04	99
TALL_050	12	2.06	47
TALL_051	30	2.56	137
TALL_052	18	2.16	74
TALL_053	9	1.55	35
TALL_054	19	2.34	61
TALL_055	25	2.76	67
TALL_056	16	1.85	110
TALL_057	18	2.49	52
TALL_058	24	2.7	76
TALL_059	14	2.28	42

Note: Percent herbaceous cover was measured by species and then added together to calculate the percent total herbaceous cover for each plot. Plots 230445 and 6445 are no longer being sampled and were not assigned a TALL plot ID.

4.4 Beetles

4.4.1 Site-Specific Methods

Beetle site characterization was conducted in June 2013 by NEON staff following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Beetle site characterization data was collected to start site level teaching collections. All samples were pooled before being sent for identification. For DNA sequence data generated as a result of these efforts, visit the Barcode of Life Datasystems (BOLD) at http://www.boldsystems.org. For more information on this protocol and data product numbers see Appendix A.

4.4.2 Results

Table 10: Beetle identification results at TALL.

Sample ID	Scientific Name
NEONcarabid8166	*Semiardistomis puncticollis*
NEONTcarabid8161	*Semiardistomis puncticollis*
NEONTcarabid8162	*Semiardistomis puncticollis*

Sample ID	Scientific Name
NEONTcarabid8160	*Semiardistomis puncticollis*
NEONTcarabid8164	*Semiardistomis puncticollis*
NEONTcarabid8159	*Semiardistomis puncticollis*
NEONcarabid8165	*Semiardistomis puncticollis*
NEONTcarabid8158	*Semiardistomis puncticollis*
NEONTcarabid8147	Carabidae
NEONTcarabid8150	Carabidae
NEONTcarabid8148	Carabidae
NEONTcarabid8153	Carabidae
NEONTcarabid8157	Carabidae
NEONTcarabid8155	Carabidae
NEONTcarabid8156	Carabidae
NEONTcarabid8154	Carabidae
NEONTcarabid8163	Carabidae
NEONTcarabid8149	Carabidae
NEONTcarabid8146	Carabidae
NEONTcarabid8151	Carabidae
NEONTcarabid8152	Carabidae
NEONTcarabid8144	Carabidae
NEONTcarabid8143	Carabidae
NEONcarabid8167	*Dicaelus furvus*
NEONTcarabid8145	*Anisodactylus* sp.

Note: Taxonomic identifications below the family level determined via genetic analysis (CO1).

4.5 Mosquitoes

4.5.1 Site-Specific Methods

Mosquito site characterization was conducted in June 2013 by NEON staff following the standard methods outlined in TOS Site Characterization Methods (RD[6]) to test protocol methods and start site level species lists. No pathogen testing was performed. All samples were pooled before being sent for identification. For more information on this protocol and data product numbers see Appendix A.

4.5.2 Results

Table 11: Mosquito identification results at TALL.

Sample ID	Scientific Name	Sex	Count
TALL.June2013.SC.1	*Aedes albopictus*	female	1
TALL.June2013.SC.1	*Aedes canadensis canadensis*	female	769
TALL.June2013.SC.1	*Aedes triseriatus*	female	16
TALL.June2013.SC.1	*Aedes vexans*	female	4
TALL.June2013.SC.1	Aedes spp.	female	3
TALL.June2013.SC.1	*Anopheles barberi*	female	1
TALL.June2013.SC.1	*Anopheles crucians*	female	6
TALL.June2013.SC.1	*Anopheles punctipennis*	female	4
TALL.June2013.SC.1	*Coquilllettidia perturbans*	female	27
TALL.June2013.SC.1	*Culex erraticus*	female	3
TALL.June2013.SC.1	*Culex nigripalpus*	female	1
TALL.June2013.SC.1	*Psorophora ferox*	female	4

4.6 Ticks

4.6.1 Site-Specific Methods

Tick drags were conducted at TALL in June 2013 by NEON staff to test protocol methods and calculate capture rates. No pathogen testing was performed. All samples were pooled before being sent for identification. For more information on this protocol and data product numbers see Appendix A.

4.6.2 Results

Table 12: Tick identification results at TALL.

Scientific Name	Number of Adult Females	Number of Adult Males
Dermacentor variabilis	2	1
Amblyomma maculatum	1	0
Ixodes scapularis	1	0
Amblyomma americanum	63	54

4.7 Species Reference Lists

A review of the literature for taxonomic lists of interest for each site was conducted prior to field work. In the case of vertebrates that NEON may capture (e.g., reptiles, amphibians, small mammals), these lists were often required

to secure permits. Key references identified in this effort are listed below. Species lists and associated references for small mammals and breeding landbirds can be found in the appendices of the respective protocols (RD[07], RD[08]).

Bousquet, Y. 2012. Catalogue of Geadephaga (Coleoptera, Adephaga) of America, north of Mexico. ZooKeys, (245), 1-1722.

Carter, R.E. and G. Cobb. 2012. Woody species composition following a wildfire in the Dugger Mountain Wilderness, Talladega National Forest, AL. Journal of the Alabama Academy of Science 83(1): 1-7. http://www.alabamaacademyofscience.org/jcurrent.php

Centers for Disease Control and Prevention. (2015). *Geographic distribution of ticks that bite humans.* Retrieved from http://www.cdc.gov/ticks/geographic/_distribution.html

Darsie Jr., R. F., and R. A. Ward. 2005. Identification and geographical distribution of the mosquitoes of North America, North of Mexico. University Press of Florida, Gainesville.

Scott Beckett, & Golden, M. (1982). Forest Vegetation and Vascular Flora of Reed Brake Research Natural Area, Alabama. Castanea, 47(4), 368-392. Retrieved from http://www.jstor.org/stable/4033029

Smith, W. H., and L. J. Rissler. 2010. Quantifying disturbance in terrestrial communities: Abundance-biomass comparisons of herpetofauna closely track forest succession. Restoration Ecology 18:195-204.

Species Inventory List. 2008. The University of Alabama/Talladega NF Oakmulgee District, Longleaf Herpetofaunal Diversity, Talladega National Forest. http://bama.ua.edu/~fi regrant/

Willis, D., R. Carter, C. Murdock, and B. Blair. 2012. Relationship between habitat type, fire frequency, and Amblyomma americanum populations in east-central Alabama. Journal of Vector Ecology 37(2): 1-9. http://onlinelibrary.wiley.com/doi/10.1111/j.1948-7134.2012.00241.x/abstract

5 RELOCATABLE SITE 1- DEAD LAKE (DELA)

Dead Lake is a seasonally flooded hardwood bottomland located in western Alabama.

Key Characteristics:

- Site host: U.S Army Corps of Engineers
- Located in: Greene County, Alabama
- Area: 4.1 km^2
- Elevation: 20-40m
- Dominant vegetation type: Overstory is broad mix of cypress (*Taxodium* spp.), black gum (*Nyssa sylvatica*), shagbark hickory (*Carya ovata*), oaks, and green ash (*Fraxinus pennsylvanica*). Ground cover includes bamboo, grass, smilax and sometimes large and in places, complete poison ivy (*Toxicodendrom radicans*) cover.
- General management: The Black Warrior & Tombigbee Waterway system surrounding Dead Lake serves commercial navigation purposes as well as recreational opportunities.
- The Black River Warrior aquatic site is located east of DELA. See the AIS site characterization report for more details (RD[05]).
- Plot Selection: NEON TOS Plots were allocated across the site following NEON standard criteria and avoiding existing research.

5.1 TOS Spatial Sampling Design

TOS plots were allocated at DELA according to a spatially balanced and stratified-random design (RD[3]). The 2006 National Land Cover Database (NLCD) was selected for stratification because of the consistent and comparable data availability across the United States. The maps below depict the plot locations for the first year of NEON sampling. Some plot locations may change over time due to logistics, safety, and science requirements. Please visit the NEON website (http://www.neonscience.org) for updated plot locations at each site.

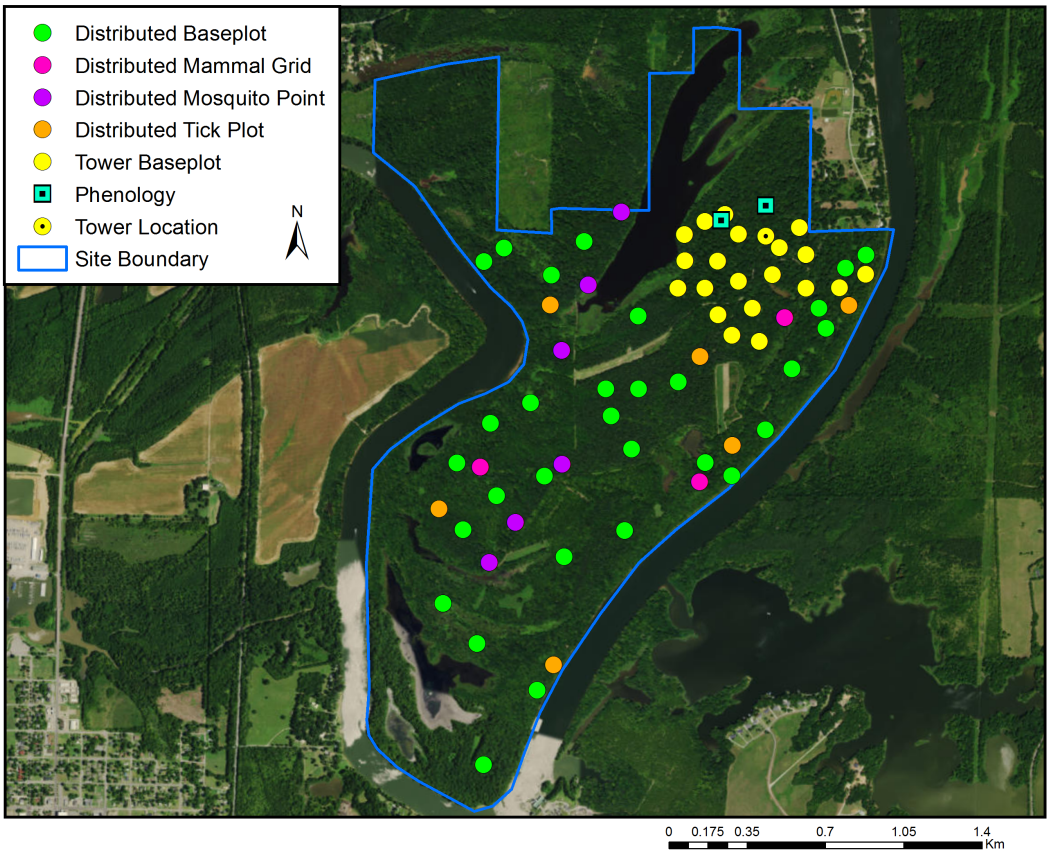

Figure 6: Map of TOS plot centroids within the NEON TOS sampling boundary at DELA.

For a list of protocols associated with each plot see tables below; for additional spatial design information see RD[03].

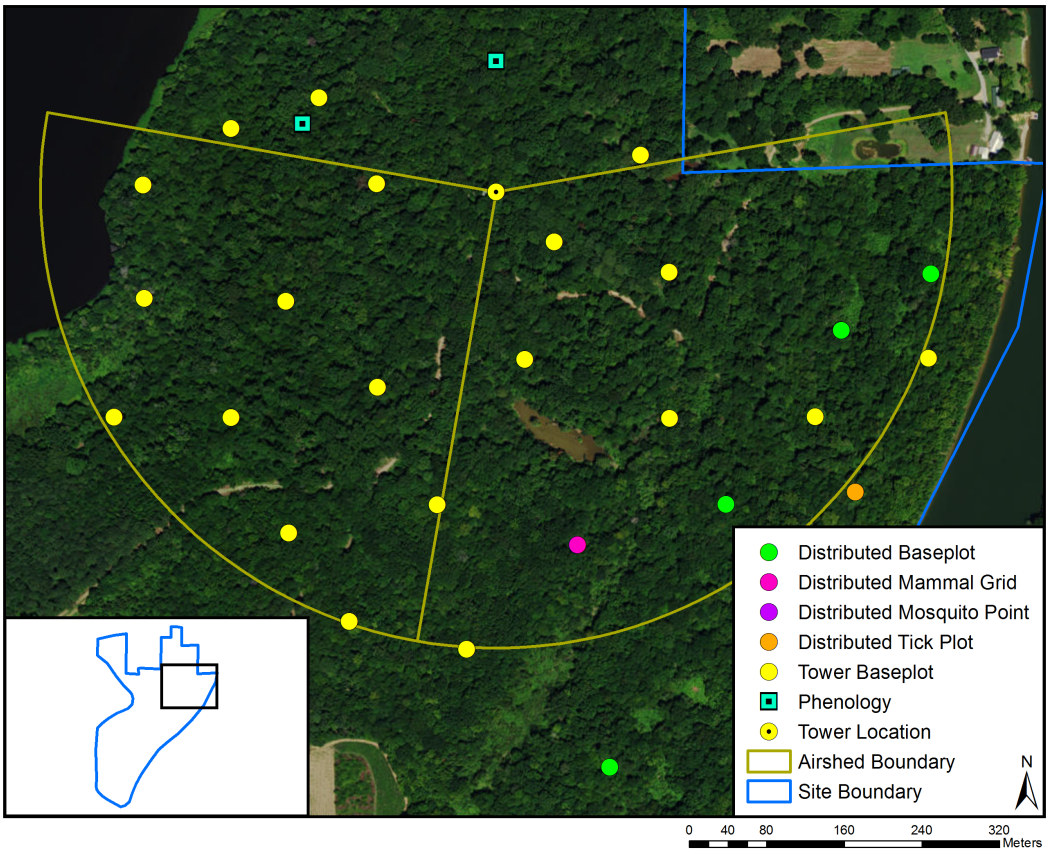

Figure 7: Map of the tower airshed and TOS plot centroids at DELA.

More information about the tower airshed can be found in the FIU site characterization report (RD[04]).

Table 13: NLCD land cover classes and area within the TOS site boundary at DELA.

NLCD Class	Site Area (km^2)	Percent (%)
Woody Wetlands	2.96	72.15
Open Water	0.57	13.95
Evergreen Forest	0.38	9.14
Deciduous Forest	0.06	1.47
Pasture Hay	0.05	1.12
Developed Open Space	0.03	0.81
Emergent Herbaceous Wetlands	0.03	0.61
Mixed Forest	0.02	0.59
Shrub Scrub	0.01	0.15

Note: Any NLCD land cover classes less than 5% will not be sampled. Additionally, no sampling will take place in Water, Developed, or Barren Land NLCD classes.

Table 14: NLCD land cover classes and TOS plot numbers at DELA.

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Base Plot	Evergreen Forest	8
Distributed	Base Plot	Woody Wetlands	22
Distributed	Mammal Grid	Woody Wetlands	3
Distributed	Mosquito Point	Evergreen Forest	1
Distributed	Mosquito Point	Woody Wetlands	9
Distributed	Tick Plot	Evergreen Forest	2
Distributed	Tick Plot	Woody Wetlands	4
Tower	Base Plot	NA	20
Tower	Phenology Plot	NA	2

Note: NLCD land cover classes are not used to stratify Tower Plots.

Table 15: Number of Distributed Base plots per NLCD land cover class per protocol at DELA.

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Evergreen Forest	Beetles	1
Distributed	Base Plot	Woody Wetlands	Beetles	9
Distributed	Base Plot	Evergreen Forest	Birds	5
Distributed	Base Plot	Woody Wetlands	Birds	13
Distributed	Base Plot	Evergreen Forest	Canopy Foliage Chemistry	1
Distributed	Base Plot	Woody Wetlands	Canopy Foliage Chemistry	5
Distributed	Base Plot	Evergreen Forest	Coarse Downed Wood	2
Distributed	Base Plot	Woody Wetlands	Coarse Downed Wood	18
Distributed	Base Plot	Evergreen Forest	Digital Hemispherical Photos for Leaf Area Index	2
Distributed	Base Plot	Woody Wetlands	Digital Hemispherical Photos for Leaf Area Index	18
Distributed	Base Plot	Evergreen Forest	Herbaceous Biomass	2
Distributed	Base Plot	Woody Wetlands	Herbaceous Biomass	18
Distributed	Base Plot	Evergreen Forest	Plant Diversity	8
Distributed	Base Plot	Woody Wetlands	Plant Diversity	22
Distributed	Base Plot	Evergreen Forest	Soil Biogeochemistry	1

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Woody Wetlands	Soil Biogeochemistry	5
Distributed	Base Plot	Evergreen Forest	Soil Microbes	1
Distributed	Base Plot	Woody Wetlands	Soil Microbes	5
Distributed	Base Plot	Evergreen Forest	Vegetation Structure	2
Distributed	Base Plot	Woody Wetlands	Vegetation Structure	18

Note: Distributed Base Plots typically support more than one TOS protocol; 'Number of Plots' cannot be added to get total TOS Distributed Base Plot number.

Table 16: Number of Tower Plots per protocol at DELA.

Plot Type	Plot Subtype	Protocols	Number of Plots
Tower	Base Plot	Below Ground Biomass Coring	20
Tower	Base Plot	Canopy Foliage Chemistry	4
Tower	Base Plot	Coarse Downed Wood	20
Tower	Base Plot	Digital Hemispherical Photos for Leaf Area Index	20
Tower	Base Plot	Herbaceous Biomass	20
Tower	Base Plot	Litterfall and Fine Woody Debris	20
Tower	Base Plot	Plant Diversity	3
Tower	Base Plot	Soil Biogeochemistry	4
Tower	Base Plot	Soil Microbes	4
Tower	Base Plot	Vegetation Structure	20
Tower	Phenology	Plant Phenology	2

Note: Tower Base Plots typically support more than one TOS protocol; 'Number of Plots' cannot be added to get total TOS Tower Base Plot number.

5.2 Belowground Biomass

5.2.1 Site-Specific Methods

Belowground biomass characterization data were collected down to a depth of 180 cm by NEON staff in April 2013. Since the NEON protocol for long-term, operational sampling of belowground biomass only collects data to a depth of 30 cm, the belowground biomass site characterization data are critical for scaling belowground biomass measurements to greater depths; see the TOS Science Design for Plant Biomass, Productivity, and Leaf Area Index (AD[7]) for more information. Samples were collected following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Roots were sorted to two diameter size categories ($\leq$ 2 mm and 2-30 mm) and by root status (live or dead). The tables below summarize all the belowground biomass less than or equal to

30 mm diameter; size class data and more information can be found by searching the NEON data portal for the data product numbers in Appendix A.

5.2.2 Results

Table 17: Fine root mass per depth increment (cm) at DELA.

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
0	10	2.61	1.49
10	20	1.28	0.32
20	30	1.57	1.7
30	40	0.43	0.25
40	50	2.25	1.86
50	60	0.22	0.22
60	70	0.42	0.4
70	80	0.19	0.14
80	90	0.25	0.19
90	100	0.52	0.66
100	120	0.32	0.4
120	140	0.14	0.08
140	160	0.01	0.02
160	180	0	0

Table 18: Cumulative fine root mass as a function of depth (cm) at DELA.

Upper Depth	Lower Depth	Mean Cumulative (g per m^2)	Cumulative Std Dev
0	10	260.75	149.44
10	20	388.53	131.79
20	30	545.92	290.26
30	40	588.57	310.43
40	50	813.37	482.61
50	60	835.55	477.25
60	70	878.04	511.79
70	80	897.51	510.65
80	90	922.96	494.87
90	100	975.03	483.18

Upper Depth	Lower Depth	Mean Cumulative (g per m^2)	Cumulative Std Dev
100	120	1038.33	480.19
120	140	1066.41	471.96
140	160	1069.03	475.52
160	180	1069.03	475.52

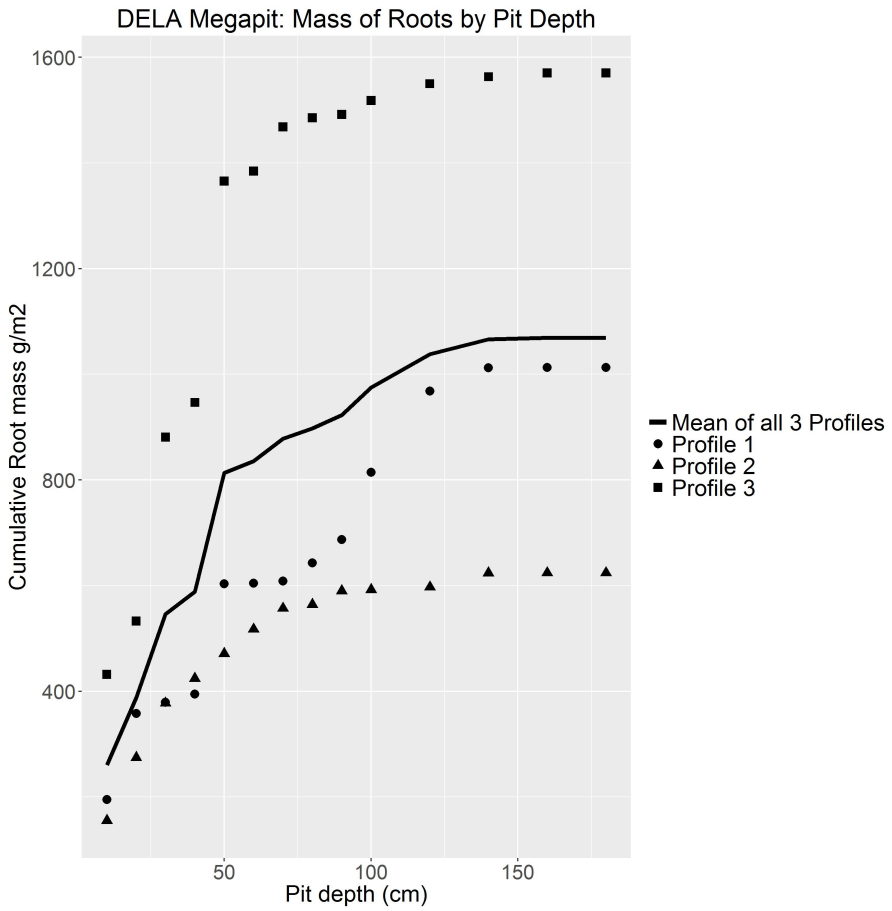

Figure 8: Cumulative root mass by pit depth at DELA.

Table 19: Fine root biomass sampling summary data at DELA.

Total Pit Depth (cm)	180
Total Cumulative Mass at 30cm (g per m^2)	545.92
Total Cumulative Mass at 100cm (g per m^2)	975.03
Total Cumulative Mass (g per m^2)	1069.03

5.3 Plant Characterization and Phenology Species Selection

5.3.1 Site-Specific Methods

Plant characterization data were collected by NEON staff in July 2015 following the standard methods outlined in TOS Site Characterization Methods (RD[6]). For more information on this protocol and data product numbers see Appendix A.

5.3.2 Results

Table 20: Site plant characterization and phenology species summary at DELA.

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
QUNI	*Quercus nigra* L.	1	<1	NA	3.32
CELA	*Celtis laevigata* Willd.	2	<1	0.001	2.38
ACRU	*Acer rubrum* L.	3	<1	0.002	2.74
CACA18	*Carpinus caroliniana* Walter	4	<1	0.006	0.55
LISI	*Ligustrum sinense* Lour.	5	<1	0.009	0
TORA2	*Toxicodendron radicans* (L.) Kuntze	6	5	NA	0.01
CATO6	*Carya tomentosa* (Lam.) Nutt.	7	<1	NA	2.1
LIST2	*Liquidambar styraciflua* L.	8	<1	NA	1.67
FRAM2	*Fraxinus americana* L.	9	<1	0	0.65
ARGI	*Arundinaria gigantea* (Walter) Muhl.	10	2	NA	NA
FRPE	*Fraxinus pennsylvanica* Marshall	11	<1	0.001	0.49
NYAQ2	*Nyssa aquatica* L.	12	NA	NA	0.95

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
CAOV2	*Carya ovata* (Mill.) K. Koch	13	<1	NA	0.92
ILDE	*Ilex decidua* Walter	14	<1	0.002	0.01
QUAL	*Quercus alba* L.	15	NA	NA	0.91
QULY	*Quercus lyrata* Walter	16	<1	NA	0.81
OSVI	*Ostrya virginiana* (Mill.) K. Koch	17	<1	NA	0.79
BICA	*Bignonia capreolata* L.	18	2	NA	0
MORU2	*Morus rubra* L.	19	<1	NA	0.56
QUFA	*Quercus falcata* Michx.	20	NA	NA	0.58
CYPER	*Cyperus* sp.	21	1	NA	NA
ASTR	*Asimina triloba* (L.) Dunal	22	<1	NA	0.03
BROV4	*Brunnichia ovata* (Walter) Shinners	23	1	NA	0
QUMI	*Quercus michauxii* Nutt.	24	NA	NA	0.48
VIRO3	*Vitis rotundifolia* Michx.	25	<1	NA	0.04
CAAQ2	*Carya aquatica* (Michx. f.) Nutt.	26	NA	NA	0.42
RUBUS	*Rubus* sp.	28	<1	NA	NA
PAQU2	*Parthenocissus quinquefolia* (L.) Planch.	29	<1	NA	0
COFO	*Cornus foemina* Mill.	30	<1	0.001	NA
ACNE2	*Acer negundo* L.	31	<1	NA	0.25
SACE	*Saururus cernuus* L.	32	<1	NA	NA
PLOC	*Platanus occidentalis* L.	33	NA	NA	0.3
2PLANT	Unknown plant	34	<1	NA	NA
POACEA	Poaceae sp.	35	<1	NA	NA
DIVI4	*Dioscorea villosa* L.	36	<1	NA	NA
AMAR5	*Ampelopsis arborea* (L.) Koehne	37	<1	NA	0
QUVE	*Quercus velutina* Lam.	38	<1	NA	0.18
BOCY	*Boehmeria cylindrica* (L.) Sw.	39	<1	NA	NA
ASIMI	*Asimina* sp.	40	<1	NA	NA

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
CAGL8	*Carya glabra* (Mill.) Sweet	41	<1	NA	0.18
SMRO	*Smilax rotundifolia* L.	43	<1	NA	NA
CARA2	*Campsis radicans* (L.) Seem. ex Bureau	44	<1	NA	0
CARYA	*Carya* sp.	45	<1	NA	0.01
DICHA2	*Dichanthelium* sp.	46	<1	NA	NA
COCA	*Cocculus carolinus* (L.) DC.	47	<1	NA	0
QURU	*Quercus rubra* L.	48	NA	NA	0.11
LOSE	*Lonicera sempervirens* L.	49	<1	NA	NA
TRDI	*Trachelospermum difforme* (Walter) A. Gray	50	<1	NA	NA
TRSE6	*Triadica sebifera* (L.) Small	51	<1	NA	0.11
CEPHA	*Cephalanthus* sp.	52	NA	0	NA
LOJA	*Lonicera japonica* Thunb.	53	<1	NA	NA
CECA	*Cedronella canariensis* (L.) Willd. ex Webb & Bethel.	54	<1	NA	NA
QUST	*Quercus stellata* Wangenh.	55	NA	NA	0.08
LIJA	*Ligustrum japonicum* Thunb.	56	<1	NA	0
SABAL	*Sabal* sp.	57	<1	NA	NA
DESMO	*Desmodium* sp.	58	<1	NA	NA
QUPH	*Quercus phellos* L.	59	<1	NA	NA
BENI	*Betula nigra* L.	60	NA	NA	0.06
DIVI5	*Diospyros virginiana* L.	61	<1	NA	0.04
SMLA	*Smilax laurifolia* L.	62	<1	NA	NA
SMGL	*Smilax glauca* Walter	63	<1	NA	NA
VIOLA	*Viola* sp.	64	<1	NA	NA
LESPE	*Lespedeza* sp.	66	<1	NA	NA
MATEL	*Matelea* sp.	66	<1	NA	NA
SANIC4	*Sambucus nigra* L. ssp. *canadensis* (L.) R. Bolli	66	<1	NA	NA
RUAR2	*Rubus argutus* Link	69	<1	NA	NA
JUVI	*Juniperus virginiana* L.	70	<1	NA	0

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
VICI2	*Vitis cinerea* (Engelm.) Engelm. ex Millard	71	<1	NA	0.02
SMBO2	*Smilax bona-nox* L.	72	<1	NA	NA
SOLID	*Solidago* sp.	73	<1	NA	NA
MIRE	*Mitchella repens* L.	74	<1	NA	NA
MORU	*Monarda russeliana* Nutt. ex Sims	74	<1	NA	NA
ARDR3	*Arisaema dracontium* (L.) Schott	77	<1	NA	NA
BESC	*Berchemia scandens* (Hill) K. Koch	78	<1	NA	0.01
QUERC	*Quercus* sp.	79	<1	NA	0.02
DIFR6	*Ditrysinia fruticosa* (W. Bartram) Govaerts & Frodin	80	<1	NA	NA
IPOMO	*Ipomoea* sp.	81	<1	NA	NA
VILA8	*Vitis labrusca* L.	81	<1	NA	NA
CECA4	*Cercis canadensis* L.	84	NA	NA	0.02
ASTER	*Aster* sp.	85	<1	NA	NA
CEOC2	*Cephalanthus occidentalis* L.	86	<1	NA	0.01
QUHE2	*Quercus hemisphaerica* W. Bartram ex Willd.	88	<1	NA	0.02
LYJA	*Lygodium japonicum* (Thunb.) Sw.	89	<1	NA	NA
RUAR	*Rubus arcticus* L.	90	<1	NA	NA
QULA3	*Quercus laurifolia* Michx.	91	NA	NA	0.02
CECA2	*Centaurea calcitrapa* L.	92	NA	NA	0.02
CAAM2	*Callicarpa americana* L.	93	<1	NA	0
AMARA	*Amaranthus* sp.	94	<1	NA	NA
CLEMA	*Clematis* sp.	94	<1	NA	NA
DICHA	*Dichaetophora* sp.	94	<1	NA	NA
SANIC	*Sanicula* sp.	98	<1	NA	NA
MEAZ	*Melia azedarach* L.	99	NA	NA	0.01

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
MECA3	*Menispermum canadense* L.	100	<1	NA	NA
MISC	*Mikania scandens* (L.) Willd.	100	<1	NA	NA
POPU5	*Polygonum punctatum* Elliott	100	<1	NA	NA
ROCA4	*Rosa carolina* L.	100	<1	NA	NA
VITIS	*Vitis* sp.	104	<1	NA	0.01
FAGR	*Fagus grandifolia* Ehrh.	105	NA	NA	0.01
ARSE3	*Aristolochia serpentaria* L.	106	<1	NA	NA
RUCA4	*Ruellia caroliniensis* (J.F. Gmel.) Steud.	106	<1	NA	NA
CAAQ	*Carex aquatilis* Wahlenb.	108	NA	NA	0.01
ARIST	*Aristida* sp.	109	<1	NA	NA
CELA	*Celtis laevigata* Willd.	109	<1	NA	2.38
CELA	*Celtis laevigata* Willd.	109	<1	NA	2.38
ONSE	*Onoclea sensibilis* L.	109	<1	NA	NA
PAGL17	*Packera glabella* (Poir.) C. Jeffrey	109	<1	NA	NA
IPPU2	*Ipomoea purpurea* (L.) Roth	115	<1	NA	NA
LOFO	*Lomatium foeniculaceum* (Nutt.) J.M. Coult. & Rose	115	<1	NA	NA
TADI2	*Taxodium distichum* (L.) Rich.	117	NA	NA	0
QUMO4	*Quercus montana* Willd.	118	NA	NA	0
ARDR	*Arabis drummondii* A. Gray	119	<1	NA	NA
CAREXSPP	*Carex* sp.	119	<1	NA	NA
CHCA4	*Chenopodium capitatum* (L.) Asch.	119	<1	NA	NA
DICHA2SPP	*Dichanthelium* sp.	119	<1	NA	NA
NYAQ	*Nymphoides aquatica* (J.F. Gmel.) Kuntze	119	<1	NA	NA
PALU2	*Passiflora lutea* L.	119	<1	NA	NA

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
POACEA	Poaceae sp.	119	<1	NA	NA
RULO4	*Rubus longii* Fernald	119	<1	NA	NA
SMBO	*Smelowskia borealis* (Greene) Drury & Rollins	119	<1	NA	NA
SMTA2	*Smilax tamnoides* L.	119	<1	NA	NA
VIAE	*Vitis aestivalis* Michx.	129	<1	NA	0
VIRO2	*Viola rotundifolia* Michx.	130	NA	NA	0
ANDRO2	*Andropogon* sp.	131	<1	NA	NA
AQUIL	*Aquilegia* sp.	131	<1	NA	NA
ARTO3	*Aristolochia tomentosa* Sims	131	<1	NA	NA
ASPE	*Asclepias perennis* Walter	131	<1	NA	NA
COREO	*Coreocarpus* sp.	131	<1	NA	NA
FRAGA	*Fragaria* sp.	131	<1	NA	NA
FRAXI	*Fraxinus* sp.	131	<1	NA	NA
JUOV	*Justicia ovata* (Walter) Lindau	131	<1	NA	NA
RUELL	*Ruellia* sp.	131	<1	NA	NA
SAMI8	*Sabal minor* (Jacq.) Pers.	131	<1	NA	NA
SMILA2	*Smilax* sp.	131	<1	NA	NA
VIVU	*Vitis vulpina* L.	131	<1	NA	NA
HAVI2	*Hackelia virginiana* (L.) I.M. Johnst.	143	NA	NA	0
LIBE3	*Lindera benzoin* (L.) Blume	144	NA	NA	0

Note: Mean canopy area is collected for shrubs. Mean area at breast height (ABH) is collected for trees. Taxon IDs and scientific names are based on the USDA Plants database (plants.usda.gov).

Table 21: Per plot breakdown of species richness, diversity, and herbaceous cover at DELA.

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover
DELA_037	27	2.86	82
DELA_038	47	2.87	112
DELA_039	30	3.04	107
DELA_040	21	2	75

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover
DELA_041	18	2.21	107
DELA_042	27	2.44	163
DELA_043	21	2.62	78
DELA_044	22	2.69	95
DELA_045	29	2.76	170
DELA_046	23	2.44	49
DELA_047	22	2.77	95
DELA_048	27	2.83	48
DELA_050	21	2.64	105
DELA_051	13	1.86	21
DELA_052	33	3.24	147
DELA_053	27	2.62	80
DELA_054	17	2.19	70
DELA_055	22	2.88	34
DELA_056	29	2.94	88

Note: Percent herbaceous cover was measured by species and then added together to calculate the percent total herbaceous cover for each plot.

5.4 Beetles

5.4.1 Site-Specific Methods

Beetle site characterization was conducted in June of 2014 following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Beetle site characterization data was collected to start site level teaching collections. All samples were pooled before being sent for identification. For DNA sequence data generated as a result of these efforts, visit the Barcode of Life Datasystems (BOLD) at http://www.boldsystems.org. For more information on this protocol and data product numbers see Appendix A.

5.4.2 Results

Table 22: Beetle identification results at DELA.

Sample ID	Scientific Name	Sex
NEONcarabid8282	*Dicaelus sculptilis*	F
NEONcarabid8283	*Dicaelus sculptilis*	F
NEONcarabid8284	*Dicaelus sculptilis*	M

Sample ID	Scientific Name	Sex
NEONcarabid8285	*Dicaelus sculptilis*	F
NEONcarabid8286	*Dicaelus sculptilis*	F
NEONcarabid8287	*Dicaelus sculptilis*	F
NEONcarabid8288	*Dicaelus sculptilis*	F
NEONcarabid8289	*Dicaelus sculptilis*	F
NEONcarabid8290	*Dicaelus sculptilis*	M
NEONcarabid8291	*Dicaelus sculptilis*	F
NEONcarabid8292	*Dicaelus sculptilis*	M
NEONcarabid8293	*Dicaelus sculptilis*	F
NEONcarabid8294	*Dicaelus sculptilis*	F
NEON8281	*Dicaelus dilatatus*	F

Note: Samples that include “carabid” in their sample ID indicate BOLD records are available. Samples without “carabid” were identified by a parataxonimist.

5.5 Mosquitoes

5.5.1 Site-Specific Methods

Mosquito site characterization was conducted in June of 2014 following the standard methods outlined in TOS Site Characterization Methods (RD[6]) to test protocol methods and start site level species lists. No pathogen testing was performed. All samples were pooled before being sent for identification. For more information on this protocol and data product numbers see Appendix A.

5.5.2 Results

Table 23: Mosquito identification results at DELA.

Sample ID	Scientific Name	Count
DELA.30June2014.SC.1	*Aedes vexans*	33
DELA.30June2014.SC.1	*Anopheles crucians*	2
DELA.30June2014.SC.1	*Anopheles quadrimaculatus*	24
DELA.30June2014.SC.1	Anopheles spp.	2
DELA.30June2014.SC.1	*Coquillettidia perturbans*	3
DELA.30June2014.SC.1	*Culex erraticus*	38
DELA.30June2014.SC.1	*Culex nigripalpus*	2

Sample ID	Scientific Name	Count
DELA.30June2014.SC.1	*Mansonia titillans*	5
DELA.30June2014.SC.1	Psorophora spp.	2

5.6 Ticks

5.6.1 Site-Specific Methods

Tick drags were conducted at DELA in June of 2014 to test protocol methods and calculate capture rates. No pathogen testing was performed. All samples were pooled before being sent for identification. For more information on this protocol and data product numbers see Appendix A.

5.6.2 Results

Table 24: Tick identification results at DELA.

Sample ID	Scientific Name	Sex
DELA_000.20140730.SC.1	*Amblyomma maculatum*	M

5.7 Species Reference Lists

A review of the literature for taxonomic lists of interest for each site was conducted prior to field work. In the case of vertebrates that NEON may capture (e.g., reptiles, amphibians, small mammals), these lists were often required to secure permits. Key references identified in this effort are listed below. Species lists and associated references for small mammals and breeding landbirds can be found in the appendices of the respective protocols (RD[07], RD[08]).

Bousquet, Y. 2012. Catalogue of Geadephaga (Coleoptera, Adephaga) of America, north of Mexico. ZooKeys, (245), 1-1722.

Centers for Disease Control and Prevention. (2015). *Geographic distribution of ticks that bite humans.* Retrieved from http://www.cdc.gov/ticks/geographic/_distribution.html

Darsie Jr., R. F., and R. A. Ward. 2005. Identification and geographical distribution of the mosquitoes of North America, North of Mexico. University Press of Florida, Gainesville.

Keener, B. R., A.R. Diamond, L. J. Davenport, P. G. Davison, S. L. Ginzbarg, C. J. Hansen, C. S. Major, D. D. Spaulding, J. K. Triplett, and M. Woods. 2016. Alabama Plant Atlas. [S.M. Landry and K.N. Campbell (original application development), Florida Center for Community Design and Research. University of South Florida]. University of West Alabama, Livingston, Alabama.

Mount, R. H. 1975. The Reptiles and Amphibians of Alabama. Auburn Univ. Agr. Exp. Sta., Auburn. Alabama.

6 RELOCATABLE SITE 2- LENOIR LANDING (LENO)

LENO is a hardwood bottomland with seasonal flooding each spring located in southwest Alabama. The tower and Tower Plots are located at Lenoir Landing and the Distributed Plots are located approximately 5km south of the tower at Choctaw National Wildlife Refuge.

Key Characteristics:

- Site host: U.S. Army Corps of Engineers,Choctaw National Wildlife Refuge- U.S. Fish and Wildlife Service
- Located in: Choctaw County, Alabama
- Area: 16.30 km^2
- Elevation: 5-30m
- Dominant vegetation type: The ecosystem at LENO is dominated by closed-canopy pine-oak mixed forest with a developed understory, and also includes a small fraction of meadows, wetlands, and smaller water bodies. Dominant plant species include American sweetgum (*Liquidambar styraciflua*), American hornbeam (*Carpinus caroliniana*), and loblolly pine (*Pinus taeda*).
- General management: Choctaw National wildlife Refuge provides a protected wintering area for waterfowl and wood duck brood habitat.
- LENO is paired with the Lower Tombigbee river aquatic site. See the AIS site characterization report for more details (RD[05]).
- Plot Selection: NEON TOS Plots were allocated across the site following NEON standard criteria and avoiding existing research.

6.1 TOS Spatial Sampling Design

TOS plots were allocated at LENO according to a spatially balanced and stratified-random design (RD[3]). The 2006 National Land Cover Database (NLCD) was selected for stratification because of the consistent and comparable data availability across the United States. The maps below depict the plot locations for the first year of NEON sampling. Some plot locations may change over time due to logistics, safety, and science requirements. Please visit the NEON website (http://www.neonscience.org) for updated plot locations at each site.

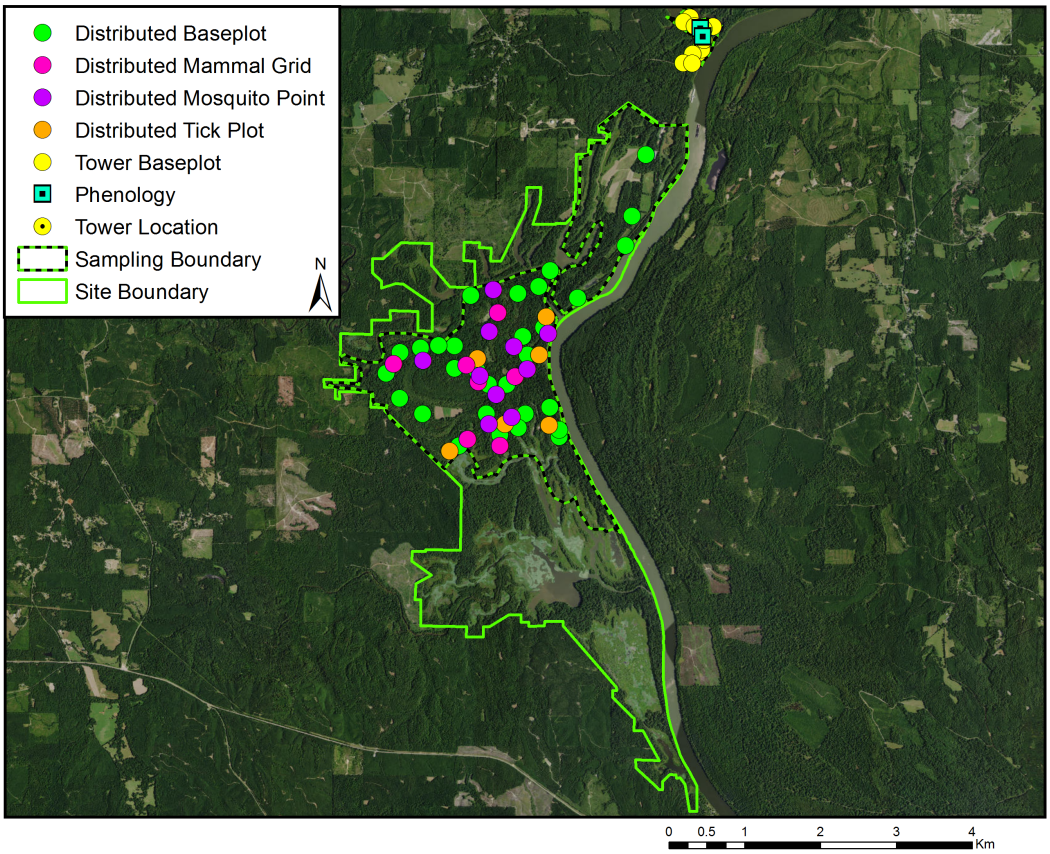

Figure 9: Map of TOS plot centroids within the NEON TOS sampling boundary at LENO.

For a list of protocols associated with each plot see tables below; for additional spatial design information see RD[03].

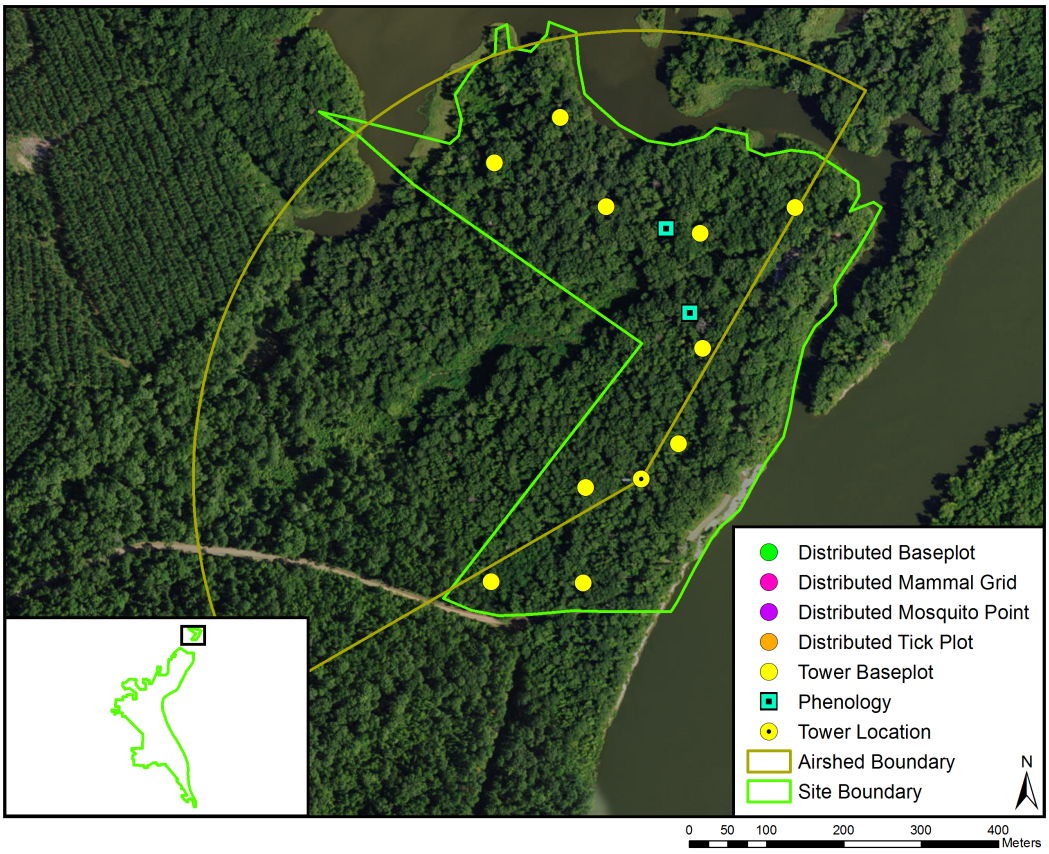

Figure 10: Map of the tower airshed and TOS plot centroids at LENO.

More information about the tower airshed can be found in the TIS site characterization report (RD[04]).

Table 25: NLCD land cover classes and area within the TOS site boundary at LENO.

NLCD Class	Site Area (km^2)	Percent (%)
Woody Wetlands	4.3	58.3
Deciduous Forest	1.92	26.02
Open Water	0.51	6.97
Developed Open Space	0.25	3.44
Pasture Hay	0.25	3.39
Shrub Scrub	0.06	0.81
Mixed Forest	0.04	0.48
Barren Land	0.02	0.22
Grassland Herbaceous	0.01	0.2
Evergreen Forest	0.01	0.18

Note: Any NLCD land cover classes less than 5% will not be sampled. Additionally, no sampling will take place in Water, Developed, or Barren Land NLCD classes.

Table 26: NLCD land cover classes and TOS plot numbers at LENO.

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Base Plot	Evergreen Forest	8
Distributed	Base Plot	Woody Wetlands	22
Distributed	Mammal Grid	Woody Wetlands	3
Distributed	Mosquito Point	Evergreen Forest	1
Distributed	Mosquito Point	Woody Wetlands	9
Distributed	Tick Plot	Evergreen Forest	2
Distributed	Tick Plot	Woody Wetlands	4
Tower	Base Plot	NA	20
Tower	Phenology Plot	NA	2

Note: NLCD land cover classes are not used to stratify Tower Plots.

Table 27: Number of Distributed Base plots per NLCD land cover class per protocol at LENO.

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Evergreen Forest	Beetles	1
Distributed	Base Plot	Woody Wetlands	Beetles	9
Distributed	Base Plot	Evergreen Forest	Birds	5
Distributed	Base Plot	Woody Wetlands	Birds	13
Distributed	Base Plot	Evergreen Forest	Canopy Foliage Chemistry	1
Distributed	Base Plot	Woody Wetlands	Canopy Foliage Chemistry	5
Distributed	Base Plot	Evergreen Forest	Coarse Downed Wood	2
Distributed	Base Plot	Woody Wetlands	Coarse Downed Wood	18
Distributed	Base Plot	Evergreen Forest	Digital Hemispherical Photos for Leaf Area Index	2
Distributed	Base Plot	Woody Wetlands	Digital Hemispherical Photos for Leaf Area Index	18
Distributed	Base Plot	Evergreen Forest	Herbaceous Biomass	2
Distributed	Base Plot	Woody Wetlands	Herbaceous Biomass	18
Distributed	Base Plot	Evergreen Forest	Plant Diversity	8
Distributed	Base Plot	Woody Wetlands	Plant Diversity	22
Distributed	Base Plot	Evergreen Forest	Soil Biogeochemistry	1

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Woody Wetlands	Soil Biogeochemistry	5
Distributed	Base Plot	Evergreen Forest	Soil Microbes	1
Distributed	Base Plot	Woody Wetlands	Soil Microbes	5
Distributed	Base Plot	Evergreen Forest	Vegetation Structure	2
Distributed	Base Plot	Woody Wetlands	Vegetation Structure	18

Note: Distributed Base Plots typically support more than one TOS protocol; 'Number of Plots' cannot be added to get total TOS Distributed Base Plot number.

Table 28: Number of Tower Plots per protocol at LENO.

Plot Type	Plot Subtype	Protocols	Number of Plots
Tower	Base Plot	Below Ground Biomass Coring	20
Tower	Base Plot	Canopy Foliage Chemistry	4
Tower	Base Plot	Coarse Downed Wood	20
Tower	Base Plot	Digital Hemispherical Photos for Leaf Area Index	20
Tower	Base Plot	Herbaceous Biomass	20
Tower	Base Plot	Litterfall and Fine Woody Debris	20
Tower	Base Plot	Plant Diversity	3
Tower	Base Plot	Soil Biogeochemistry	4
Tower	Base Plot	Soil Microbes	4
Tower	Base Plot	Vegetation Structure	20
Tower	Phenology	Plant Phenology	2

Note: Tower Base Plots typically support more than one TOS protocol; 'Number of Plots' cannot be added to get total TOS Tower Base Plot number.

6.2 Belowground Biomass

6.2.1 Site-Specific Methods

Belowground biomass characterization data were collected down to a depth of 200 cm by NEON staff in March 2015. Since the NEON protocol for long-term, operational sampling of belowground biomass only collects data to a depth of 30 cm, the belowground biomass site characterization data are critical for scaling belowground biomass measurements to greater depths; see the TOS Science Design for Plant Biomass, Productivity, and Leaf Area Index (AD[7]) for more information. Samples were collected following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Roots were sorted to two diameter size categories ($\leq$ 4 mm and 4-30 mm) and by root status (live or dead). The tables below summarize all the belowground biomass less than or equal to

30 mm diameter; size class data and more information can be found by searching the NEON data portal for the data product numbers in Appendix A.

6.2.2 Results

Table 29: Fine root mass per depth increment (cm) at LENO.

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
0	10	11.93	6.15
10	20	3.38	1.02
20	30	4.97	6.73
30	40	6.78	11.13
40	50	27.31	24.56
50	60	0.48	0.33
60	70	0.53	0.48
70	80	1.33	1.62
80	90	1.25	1.62
90	100	0.86	1.26
100	120	0.13	0.08
120	140	0.07	0.11
140	160	0.1	0.12
160	180	0.05	0.03
180	200	0.28	0.48

Table 30: Cumulative fine root mass as a function of depth (cm) at LENO.

Upper Depth	Lower Depth	Mean Cumulative (g per m^2)	Cumulative Std Dev
0	10	1193.17	614.75
10	20	1530.93	513.28
20	30	2027.81	203.17
30	40	2705.63	1297.85
40	50	5437.03	3565.51
50	60	5485.37	3598.05
60	70	5538.69	3550.22
70	80	5671.46	3693.94
80	90	5796.29	3839.64

Upper Depth	Lower Depth	Mean Cumulative (g per m^2)	Cumulative Std Dev
90	100	5881.93	3949.37
100	120	5907.22	3960.76
120	140	5922.05	3943.36
140	160	5941.63	3926.24
160	180	5951.38	3921.41
180	200	6008.13	3915.28

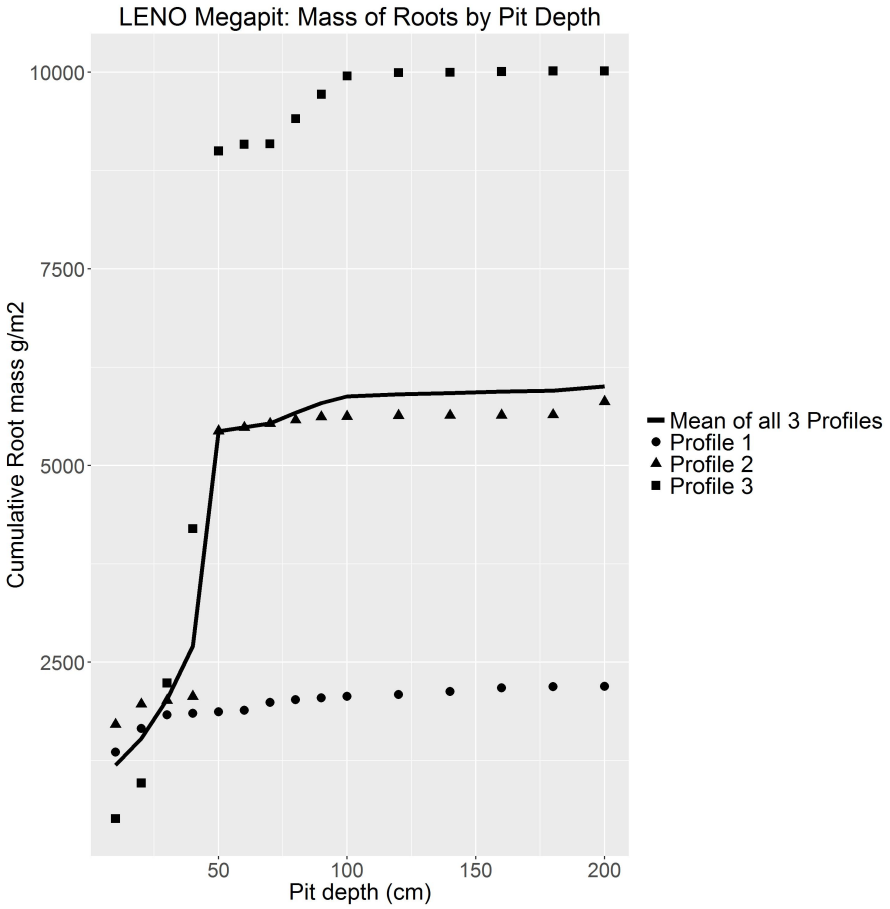

Figure 11: Cumulative root mass by pit depth at LENO.

Table 31: Fine root biomass sampling summary data at LENO.

Total Pit Depth (cm)	200
Total Cumulative Mass at 30cm (g per m^2)	2027.81
Total Cumulative Mass at 100cm (g per m^2)	5881.93
Total Cumulative Mass (g per m^2)	6008.13

6.3 Plant Characterization and Phenology Species Selection

6.3.1 Site-Specific Methods

Plant characterization data were collected by NEON staff in August 2015 following the standard methods outlined in TOS Site Characterization Methods (RD[6]). For more information on this protocol and data product numbers see Appendix A.

6.3.2 Results

Table 32: Site plant characterization and phenology species summary at LENO.

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
LIST2	*Liquidambar styraciflua* L.	1	1	NA	10.12
CACA18	*Carpinus caroliniana* Walter	2	2	0.004	2.45
ILDE	*Ilex decidua* Walter	3	4	0.1	0.43
PITA	*Pinus taeda* L.	4	<1	NA	2.63
QUNI	*Quercus nigra* L.	5	<1	NA	1.76
QUVE	*Quercus velutina* Lam.	6	<1	NA	2.23
FRAM2	*Fraxinus americana* L.	7	<1	NA	0.21
QULA3	*Quercus laurifolia* Michx.	8	<1	NA	1.9
SYTI	*Symplocos tinctoria* (L.) L'Hér.	9	NA	NA	1.9
QUPA	*Quercus* ×*palaeolithicola* Trel.	10	<1	NA	1.45
CAPA24	*Carya pallida* (Ashe) Engl. & Graebn.	11	NA	NA	1.17
HADI3	*Halesia diptera* Ellis	12	<1	0.008	0.48

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
OSVI	*Ostrya virginiana* (Mill.) K. Koch	13	<1	NA	0.75
ILOP	*Ilex opaca* Aiton	14	<1	0.008	0.22
CYPER	*Cyperus* sp.	15	4	NA	NA
NYSY	*Nyssa sylvatica* Marshall	16	<1	NA	0.64
CELTI	*Celtis* sp.	17	<1	0.004	0.33
LISI	*Ligustrum sinense* Lour.	18	<1	0.017	0
CAOV2	*Carya ovata* (Mill.) K. Koch	19	NA	NA	0.51
QUPH	*Quercus phellos* L.	20	<1	NA	0.5
QULY	*Quercus lyrata* Walter	21	<1	NA	0.33
PAQU2	*Parthenocissus quinquefolia* (L.) Planch.	22	2	NA	0
TORA2	*Toxicodendron radicans* (L.) Kuntze	23	2	NA	0.04
CAAQ2	*Carya aquatica* (Michx. f.) Nutt.	24	NA	NA	0.37
DESMO	*Desmodium* sp.	25	2	NA	NA
LOJA	*Lonicera japonica* Thunb.	26	2	NA	NA
RUBUS	*Rubus* sp.	27	2	NA	NA
CATO6	*Carya tomentosa* (Lam.) Nutt.	28	<1	NA	0.25
PIEC2	*Pinus echinata* Mill.	29	<1	NA	0.3
QUPA5	*Quercus pagoda* Raf.	30	NA	NA	0.29
DIVI5	*Diospyros virginiana* L.	32	<1	NA	0.05
POTR4	*Poncirus trifoliata* (L.) Raf.	33	<1	NA	NA
RUCA4	*Ruellia caroliniensis* (J.F. Gmel.) Steud.	34	1	NA	NA
ILVO	*Ilex vomitoria* Aiton	35	NA	NA	0
BUMEL	*Sideroxylon* sp.	36	NA	NA	NA
BICA	*Bignonia capreolata* L.	37	<1	NA	NA
QUMI	*Quercus michauxii* Nutt.	39	<1	NA	0.02
MIRE	*Mitchella repens* L.	40	<1	NA	NA
LITU	*Liriodendron tulipifera* L.	41	NA	NA	0.13

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
SAAL5	*Sassafras albidum* (Nutt.) Nees	42	NA	NA	0.11
VIRO3	*Vitis rotundifolia* Michx.	43	<1	NA	0.04
PRSE	*Prenanthes serpentaria* Pursh	45	<1	NA	0.03
CARYA	*Carya* sp.	46	<1	NA	NA
ITVI	*Itea virginica* L.	47	NA	NA	NA
CRATA	*Crataegus* sp.	48	NA	NA	0.01
AMAR5	*Ampelopsis arborea* (L.) Koehne	49	<1	NA	NA
ACRU	*Acer rubrum* L.	50	<1	NA	0.07
TRDI	*Trachelospermum difforme* (Walter) A. Gray	51	<1	NA	NA
CARA2	*Campsis radicans* (L.) Seem. ex Bureau	52	<1	NA	0.01
CLMA4	*Clitoria mariana* L.	53	<1	NA	NA
DICHA2	*Dichanthelium* sp.	54	<1	NA	NA
BROV4	*Brunnichia ovata* (Walter) Shinners	55	<1	NA	NA
VAEL	*Vaccinium elliottii* Chapm.	56	<1	NA	NA
SMBO2	*Smilax bona-nox* L.	57	<1	NA	NA
ARDR3	*Arisaema dracontium* (L.) Schott	58	<1	NA	NA
VIVU	*Vitis vulpina* L.	59	<1	NA	0.01
ACNE2	*Acer negundo* L.	60	<1	NA	0.05
SANIC	*Sanicula* sp.	61	<1	NA	NA
DIVI4	*Dioscorea villosa* L.	62	<1	NA	NA
CAGL8	*Carya glabra* (Mill.) Sweet	63	NA	NA	0.04
CAAQ3	*Catabrosa aquatica* (L.) P. Beauv.	64	NA	NA	0.03
FAGR	*Fagus grandifolia* Ehrh.	65	NA	NA	0.03
SMLA	*Smilax laurifolia* L.	66	<1	NA	NA
SMRO	*Smilax rotundifolia* L.	66	<1	NA	NA
SACE	*Saururus cernuus* L.	68	<1	NA	NA

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
SOLID	*Solidago* sp.	68	<1	NA	NA
BOCY	*Boehmeria cylindrica* (L.) Sw.	70	<1	NA	NA
JUVI	*Juniperus virginiana* L.	71	NA	NA	0.02
MATEL	*Matelea* sp.	72	<1	NA	NA
URTIC	*Urtica* sp.	73	<1	NA	NA
ACSA2	*Acer saccharinum* L.	74	NA	NA	0.01
GALIU	*Galium* sp.	75	<1	NA	NA
SMGL	*Smilax glauca* Walter	75	<1	NA	NA
VICI2	*Vitis cinerea* (Engelm.) Engelm. ex Millard	77	NA	NA	0.01
COCA	*Cocculus carolinus* (L.) DC.	78	<1	NA	NA
HILA8	*Hieracium lachenalii* C.C. Gmel.	78	<1	NA	NA
SILY	*Sideroxylon lycioides* L.	78	<1	NA	NA
MORU2	*Morus rubra* L.	81	<1	NA	0
SECA4	*Seymeria cassioides* (J.F. Gmel.) S.F. Blake	82	NA	NA	0.01
TIUS	*Tillandsia usneoides* (L.) L.	83	<1	NA	NA
JUOV	*Justicia ovata* (Walter) Lindau	84	<1	NA	NA
MECA3	*Menispermum canadense* L.	85	<1	NA	NA
OXALI	*Oxalis* sp.	85	<1	NA	NA
TRPI	*Tradescantia pinetorum* Greene	85	<1	NA	NA
NYAQ2	*Nyssa aquatica* L.	89	NA	NA	0.01
IMPAT	*Impatiens* sp.	90	<1	NA	NA
ONSE	*Onoclea sensibilis* L.	90	<1	NA	NA
PALU2	*Passiflora lutea* L.	90	<1	NA	NA
SMTA2	*Smilax tamnoides* L.	90	<1	NA	NA
ARSE3	*Aristolochia serpentaria* L.	94	<1	NA	NA
LYVI4	*Lycopus virginicus* L.	94	<1	NA	NA

Taxon ID	Scientic Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
SANIC4	*Sambucus nigra* L. ssp. *canadensis* (L.) R. Bolli	94	<1	NA	NA
SMWA	*Smilax walteri* Pursh	94	<1	NA	NA
VIOLA	*Viola* sp.	94	<1	NA	NA
WISTE	*Wisteria* sp.	100	NA	NA	0

Note: Mean canopy area is collected for shrubs. Mean area at breast height (ABH) is collected for trees. Taxon IDs and scientific names are based on the USDA Plants database (plants.usda.gov).

Table 33: Per plot breakdown of species richness, diversity, and herbaceous cover at LENO.

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover
LENO_061	37	3.23	112
LENO_062	23	2.85	49
LENO_063	28	2.07	161
LENO_064	30	2.48	137
LENO_065	28	2.62	101
LENO_066	28	3.01	78
LENO_067	28	3.1	93
LENO_068	18	1.7	82
LENO_069	23	1.83	130
LENO_070	32	2.42	277

Note: Percent herbaceous cover was measured by species and then added together to calculate the percent total herbaceous cover for each plot.

6.4 Beetles

6.4.1 Site-Specific Methods

No beetle site characterization was conducted at LENO. For more information on this protocol and data product numbers see Appendix A.

6.5 Mosquitoes

6.5.1 Site-Specific Methods

No mosquito site characterization was conducted at LENO. For more information on this protocol and data product numbers see Appendix A.

6.6 Ticks

6.6.1 Site-Specific Methods

No tick site characterization was conducted at LENO. For more information on this protocol and data product numbers see Appendix A.

6.7 Species Reference Lists

A review of the literature for taxonomic lists of interest for each site was conducted prior to field work. In the case of vertebrates that NEON may capture (e.g., reptiles, amphibians, small mammals), these lists were often required to secure permits. Key references identified in this effort are listed below. Species lists and associated references for small mammals and breeding landbirds can be found in the appendices of the respective protocols (RD[07], RD[08]). See the DELA species reference list section for statewide resources.

Bousquet, Y. 2012. Catalogue of Geadephaga (Coleoptera, Adephaga) of America, north of Mexico. ZooKeys, (245), 1-1722.

Centers for Disease Control and Prevention. (2015). *Geographic distribution of ticks that bite humans.* Retrieved from http://www.cdc.gov/ticks/geographic/_distribution.html

Darsie Jr., R. F., and R. A. Ward. 2005. Identification and geographical distribution of the mosquitoes of North America, North of Mexico. University Press of Florida, Gainesville.

7 REFERENCES

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, *PE&RS*, Vol. 77(9):858-864.

National Water Quality Assessment Program (NAWQA): Mobile River Basin Study. 2013, January 15. USGS. http://al.water.usgs.gov/nawqa/mobl/basin.html.

USDA, NRCS. 2016. The PLANTS Database (http://plants.usda.gov, 1 August 2016). National Plant Data Team, Greensboro, NC 27401-4901 USA.

8 APPENDIX A: DATA PRODUCT NUMBERS

For more information on the sampling protocols and the latest observatory data visit http://data.neonscience.org/data-product-catalog and search by name or code number.

Table 34: NEON data product names and descriptions.

Name	Description	Identification Code
Root sampling (megapit)	Fine root biomass in 10cm increments (first 1m depth) and 20cm increments (from 1m to 2m depth) from soil pit sampling	NEON.DOM.SITE.DP1.10066
Soil physical properties (Megapit)	Soil taxonomy, horizon names, horizon depths, as well as soil bulk density, porosity, texture (sand, silt, and clay content) in the <= 2 mm soil fraction for each soil horizon. Data were derived from a sampling location expected to be representative of the area where the Instrumented Soil Plots per site are located and were collected once during site construction. Also see distributed soil data products.	NEON.DOM.SITE.DP1.00096
Soil chemical properties (Megapit)	Total content of a range of chemical elements, pH, and electrical conductivity in the <= 2 mm soil fraction for each soil horizon. Data were derived from a sampling location expected to be representative of the area where the Instrumented Soil Plots per site are located and were collected once during site construction. Also see distributed soil data products.	NEON.DOM.SITE.DP1.00097
Woody plant vegetation structure	Structure measurements, including height, canopy diameter, and stem diameter, as well as mapped position of individual woody plants	NEON.DOM.SITE.DP1.10098
Plant presence and percent cover	Plant species presence as observed in multi-scale plots: species and associated percent cover at 1-m2 and plant species presence at 10-m2, 100-m2 and 400-m2	NEON.DOM.SITE.DP1.10058
Plant phenology observations	Phenophase status and intensity of tagged plants	NEON.DOM.SITE.DP1.10055
Plant foliar stable isotopes	Field collection metadata describing the sampling of sun-lit canopy foliar tissues for stable isotope compositions. Also includes raw data returned from the laboratory.	NEON.DOM.SITE.DP1.10053
Plant foliar physical and chemical properties	Plant sun-lit canopy foliar physical (e.g., leaf mass per area) and chemical properties reported at the level of the individual.	NEON.DOM.SITE.DP1.10026

Name	Description	Identification Code
Non-herbaceous perennial vegetation structure	Field measurements of individual non-herbaceous perennial plants (e.g. cacti, ferns)	NEON.DOM.SITE.DP1.10045.
Ground beetles sampled from pitfall traps	Taxonomically identified ground beetles and the plots and times from which they were collected.	NEON.DOM.SITE.DP1.10022
Ground beetle sequences DNA barcode	CO1 DNA sequences from select ground beetles	NEON.DOM.SITE.DP1.10020
Mosquitoes sampled from CO2traps	Taxonomically identified mosquitoes and the plots and times from which they were collected	NEON.DOM.SITE.DP1.10043
Mosquito-borne pathogen status	Presence/absence of a pathogen in a single mosquito sample (pool)	NEON.DOM.SITE.DP1.10041
Mosquito sequences DNA barcode	CO1 DNA sequences from select mosquitoes	NEON.DOM.SITE.DP1.10038
Ticks sampled using drag cloths	Abundance and density of ticks collected by drag and/or flag sampling (by species and/or lifestage)	NEON.DOM.SITE.DP1.10093
Tick-borne pathogen status	Presence/absence of a pathogen in each single tick sample	NEON.DOM.SITE.DP1.10092