TOS SITE CHARACTERIZATION REPORT: DOMAIN 03

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See configuration management system for approval history.

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CHANGE RECORD

REVISION	DATE	ECO#	DESCRIPTION OF CHANGE
A	11/02/2016	ECO-04253	Initial Release
B	12/05/2018	ECO-05647	• Added Phenocam images • Added Sampling Season Section • Added soil pit information table • Added percent cover of bryophyte to the plant diversity table • Updated introduction language to the site information, biomass, and plant sections

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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 Southeast 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 and Productivity
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.011034	TIS Site Characterization Report
RD[05]	NEON.DOC.001591	AOS 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
RD[09]	NEON.DOC.014042	TOS Protocol and Procedure: Plant Diversity Sampling
RD[10]	NEON.DOC.000987	TOS Protocol and Procedure: Measurement of Vegetation Structure
RD[11]	NEON.DOC.014040	TOS Protocol and Procedure: Plant Phenology
RD[12]	NEON.DOC.001709	TOS Protocol and Procedure: Bryophyte Productivity

2.3 Acronyms

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

3 DOMAIN 03 OVERVIEW: SOUTHEAST DOMAIN

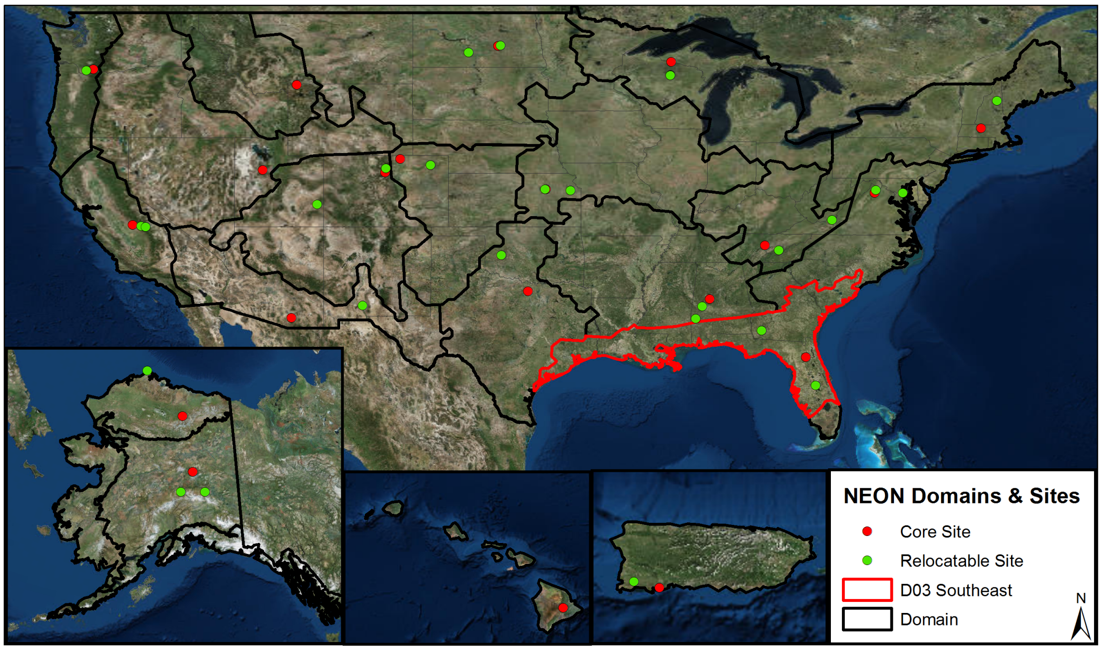

Figure 1: NEON project map with Domain 03 highlighted in red

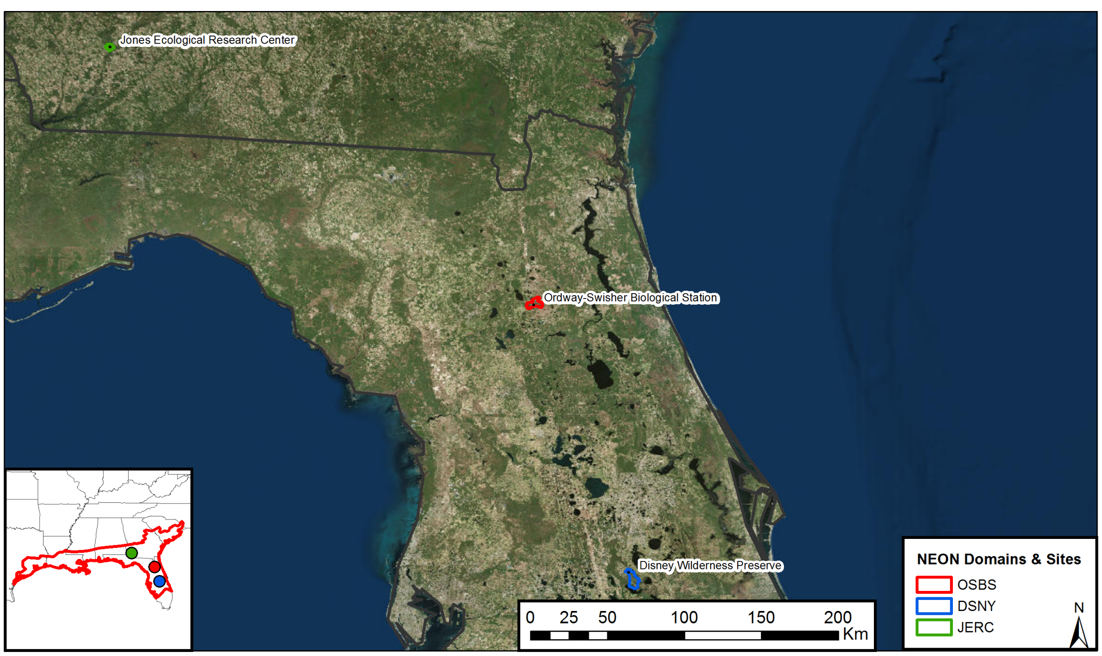

Figure 2: Site boundaries within Domain 03

The Southeast Domain is a patchwork of forest, grassland, and wetland communities embedded in a matrix that is increasingly dominated by a fast growing human population. The main theme for the Southeast Domain is understanding how forest management impacts ecology; in particular prescribed fires and restoration practices.

- States included in the domain: Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Texas
- Core site: Ordway-Swisher Biological Station
- Relocatable 1: Disney Wilderness Preserve
- Relocatable 2: Jones Ecological Research Center
- Science themes: Forest Management

4 CORE SITE- ORDWAY-SWISHER BIOLOGICAL STATION (OSBS)

The Ordway-Swisher Biological Station (OSBS) is operated by the University of Florida and comprises over 9,300 acres (38km^2). It is a year-round field station established for the long-term study and conservation of unique ecosystems through management, research, and education. The station is located approximately 20 miles east of Gainesville in Melrose (Putnam County, Florida). The OSBS site is managed to maintain intact longleaf pine ecosystem, which is one of the historically dominant forest types in the region. The longleaf pine ecosystem spans the region, with deep sandy soils through the central ridgeline from North-to-mid Florida.

Figure 3: Phenocamera image for OSBS. The phenocamera is located at the top of the NEON tower and faces north. Phenocamera images are available at https://phenocam.sr.unh.edu/webcam/network/table/.

Key Characteristics:

- Site host: University of Florida Foundation
- Located in: Putnam County, Florida
- Sampling Area: 36.8 km^2
- Plot Elevation: 20-50m
- Dominant vegetation type- Ordway-Swisher is dominated by pine and turkey oak (*Quercus laevis*) vegetation with a grass and forb groundcover. Pines are primarily Longleaf Pines (*Pinus palustris* Mill.) and Lobolly

(*P. taeda*) and the dominant perennial grass is wiregrass (*Aristida stricta Michx.*). Numerous species of other perennial grasses and forbs are also present.
- General management: The forest is maintained by fire and has a relatively open structure: it is managed with prescribed burns at a frequency of 3-4 years.
- There are two aquatic arrays at Ordway-Swisher: 1) Suggs lake, a shallow surface water lake that is rich in taxa and biologically active in structure and function; and 2) Barco lake, a deep lake connected to ground water. See the AOS 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 (see next section for more detail).

4.1 TOS Spatial Sampling Design

TOS plots were allocated at OSBS 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. At the OSBS site, some vegetation dominated by turkey oak (*Quercus laevis*) and long-leaf pine (*Pinus palustris*) were erroneously classified as shrub-scrub by the NLCD due to short canopy height. Erroneously classified vegetation was not included in the initial TOS sampling design, and affected shrub-scrub vegetation will be reclassified with data from NEON's remote-sensing platform in the first years of Observatory operations. When re-classification is complete, TOS Distributed base plots will be reallocated to proportionally represent the re-classified vegetation. TOS Tower Plots were allocated according to a spatially balanced design in and around the NEON tower airshed (RD[03]). 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.

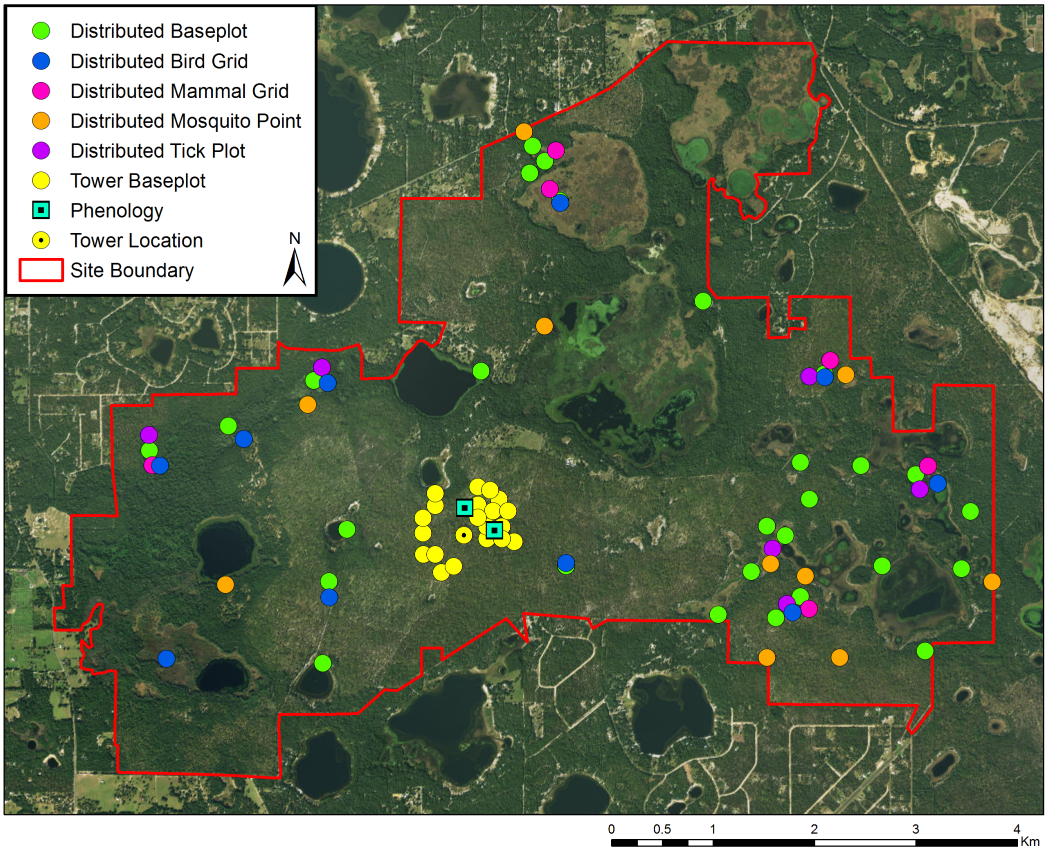

Figure 4: Map of TOS plot centroids within the NEON TOS sampling boundary at OSBS.

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

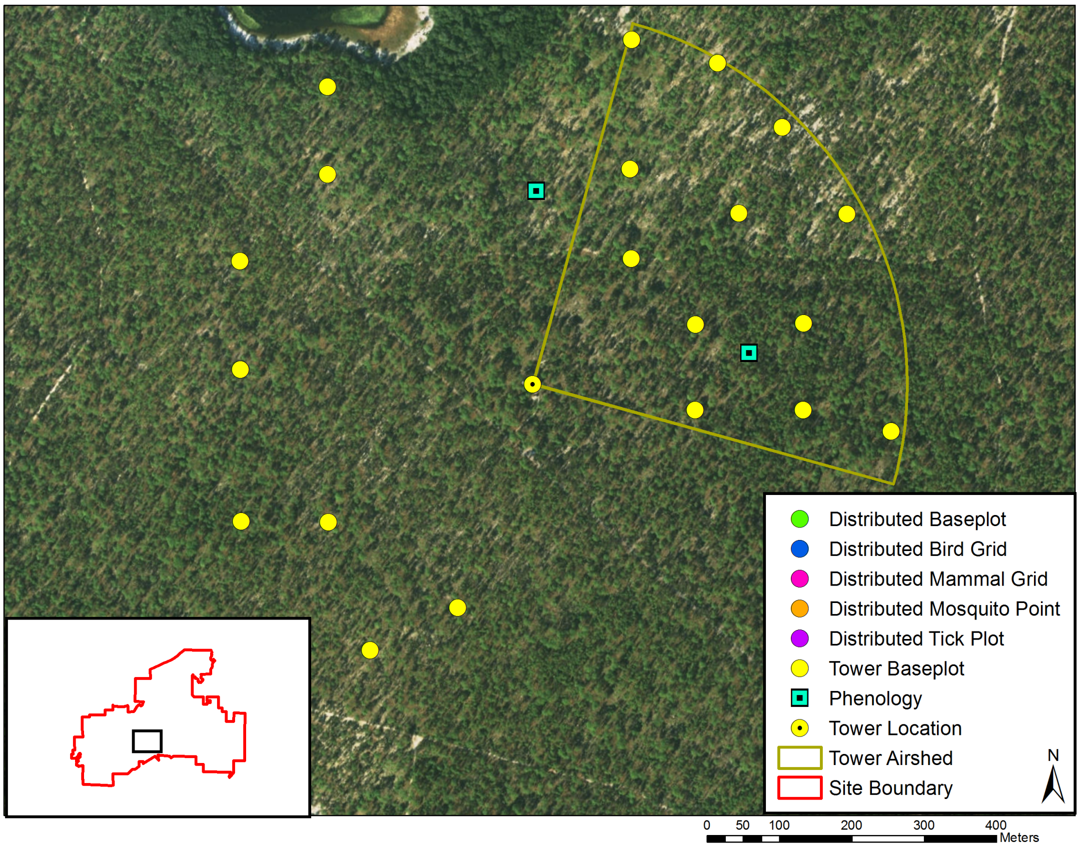

Figure 5: Map of the tower airshed and TOS Tower Plot centroids at OSBS.

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 OSBS.

NLCD Class	Site Area (km^2)	Percent (%)
Evergreen Forest	11.89	32.25
Shrub Scrub	8.99	24.38
Woody Wetlands	6.18	16.76
Emergent Herbaceous Wetlands	3.49	9.47
Developed Open Space	2.01	5.46
Open Water	2.01	5.44
Grassland Herbaceous	1.72	4.66
Pasture Hay	0.33	0.9
Mixed Forest	0.2	0.54
Deciduous Forest	0.04	0.1
Developed Low Intensity	0.01	0.03

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 OSBS.

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Base Plot	Evergreen Forest	11
Distributed	Base Plot	Woody Wetlands	10
Distributed	Base Plot	Emergent Herbaceous Wetlands	7
Distributed	Bird Grid	Evergreen Forest	5
Distributed	Bird Grid	Woody Wetlands	4
Distributed	Bird Grid	Emergent Herbaceous Wetlands	1
Distributed	Mammal Grid	Evergreen Forest	4
Distributed	Mammal Grid	Woody Wetlands	2
Distributed	Mammal Grid	Emergent Herbaceous Wetlands	1
Distributed	Mosquito Point	Evergreen Forest	6
Distributed	Mosquito Point	Woody Wetlands	2
Distributed	Mosquito Point	Emergent Herbaceous Wetlands	2
Distributed	Tick Plot	Evergreen Forest	3
Distributed	Tick Plot	Woody Wetlands	2
Distributed	Tick Plot	Emergent Herbaceous Wetlands	1
Tower	Base Plot	NA	20

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Tower	Phenology Plot	NA	2

Note: NLCD land cover classes are not used to stratify Tower Plots which are located in and around the NEON tower airshed. The dominant NLCD land cover type within the airshed is evergreen forest.

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

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Emergent Herbaceous Wetlands	Beetles	2
Distributed	Base Plot	Evergreen Forest	Beetles	6
Distributed	Base Plot	Woody Wetlands	Beetles	2
Distributed	Base Plot	Emergent Herbaceous Wetlands	Canopy Foliage Chemistry	2
Distributed	Base Plot	Evergreen Forest	Canopy Foliage Chemistry	5
Distributed	Base Plot	Woody Wetlands	Canopy Foliage Chemistry	3
Distributed	Base Plot	Emergent Herbaceous Wetlands	Coarse Downed Wood	4
Distributed	Base Plot	Evergreen Forest	Coarse Downed Wood	10
Distributed	Base Plot	Woody Wetlands	Coarse Downed Wood	6
Distributed	Base Plot	Emergent Herbaceous Wetlands	Digital Hemispherical Photos for Leaf Area Index	4
Distributed	Base Plot	Evergreen Forest	Digital Hemispherical Photos for Leaf Area Index	10
Distributed	Base Plot	Woody Wetlands	Digital Hemispherical Photos for Leaf Area Index	6
Distributed	Base Plot	Emergent Herbaceous Wetlands	Herbaceous Biomass	4
Distributed	Base Plot	Evergreen Forest	Herbaceous Biomass	10
Distributed	Base Plot	Woody Wetlands	Herbaceous Biomass	6
Distributed	Base Plot	Emergent Herbaceous Wetlands	Plant Diversity	7
Distributed	Base Plot	Evergreen Forest	Plant Diversity	11
Distributed	Base Plot	Woody Wetlands	Plant Diversity	10
Distributed	Base Plot	Emergent Herbaceous Wetlands	Soil Biogeochemistry	2
Distributed	Base Plot	Evergreen Forest	Soil Biogeochemistry	2
Distributed	Base Plot	Woody Wetlands	Soil Biogeochemistry	2
Distributed	Base Plot	Emergent Herbaceous Wetlands	Soil Microbes	2
Distributed	Base Plot	Evergreen Forest	Soil Microbes	2
Distributed	Base Plot	Woody Wetlands	Soil Microbes	2
Distributed	Base Plot	Emergent Herbaceous Wetlands	Vegetation Structure	4

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Evergreen Forest	Vegetation Structure	10
Distributed	Base Plot	Woody Wetlands	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 OSBS.

Plot Type	Plot Subtype	Protocols	Number of Plots
Tower	Base Plot	Canopy Foliage Chemistry	4
Tower	Base Plot	Coarse Downed Wood	20
Tower	Base Plot	Digital Hemispherical Photos for Leaf Area Index	3
Tower	Base Plot	Herbaceous Biomass	20
Tower	Base Plot	Litterfall and Fine Woody Debris	20
Tower	Base Plot	Plant Belowground Biomass	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 the total TOS Tower Base Plot number.

4.2 Sampling Season Characterization: OSBS

For numerous TOS protocols, the length of the sampling season, the number of bouts, and when those bouts occur is dictated by the seasonal status of the plant community. By monitoring 'greenness' on a 16 day interval, the MODIS/Terra EVI phenology product provides consistent, reliable insight into plant community phenology and intensity at the continental scale. For those protocols for which timing is standardized by greenness transitions and/or peak green status, NEON has utilized these data as the primary means of guiding temporal aspects of TOS sampling at each site.

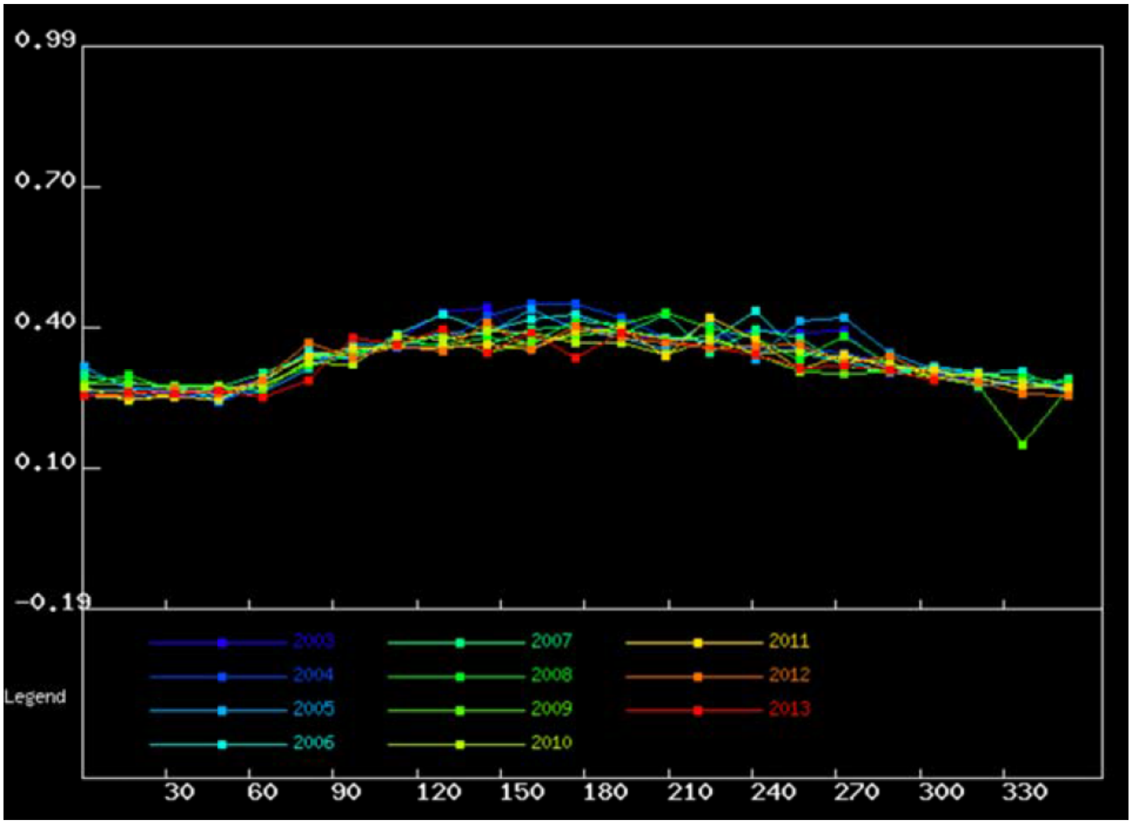

Figure 6: MODIS-EVI greenness (y-axis = EVI ratio) as a function of time (x-axis = DOY) for the years 2003-2013 at the NEON OSBS site.

Table 5: Average MODIS-EVI greenness dates for the NEON OSBS site, based on data from 2003-2013 (DOY, with MM/DD in parentheses).

Average Increase	Average Maximum	Average Decrease	Average Minimum
70 (03/12)	150 (05/31)	190 (07/10)	315 (11/12)

MODIS Product Details

- Product: MODIS-EVI phenology product, 16 day interval, 250 m grid, data included from all pixels with acceptable quality within user-defined square that roughly overlaps the TOS site boundary.
- Date range: 2003-2013
- User selected area: 10.25 km x 10.25 km box, Latitude: 29.68927, Longitude: -81.99343 (WGS84 datum)

4.3 Belowground Biomass

4.3.1 Site-Specific Methods

Belowground biomass characterization data were collected down to a depth of 170 cm by NEON staff in June 2012. 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[8]) for more information. Samples were collected following the standard methods outlined in TOS Site Characterization Methods (RD[6]). A bulk density soil corer was used instead of a soil knife to extract soil. Roots were sorted by diameter size (less than or greater than two mm) and 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.

4.3.2 Results

Table 6: Soil Pit Information at OSBS.

Latitude	Longitude	Soil Family	Soil Order
29.68819	-81.99345	Hyperthermic - uncoated Typic Quartzipsamments	Entisol

Soil Profile was described by experts from the University of Florida.

Table 7: Fine root mass per depth increment (cm) at OSBS

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
0	10	1.77	2.06
10	20	0.99	0.7
20	30	1.61	1.19
30	40	0.71	0.66
40	50	0.21	0.19
50	60	0.22	0.05
60	70	0.18	0.14
70	80	0.12	0.04
80	90	0.05	0.03
90	100	0.05	0.01
100	110	0.02	0.02
110	120	0.15	0.08
120	130	0.02	0.03

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
130	140	0.06	0.05
140	150	0.01	0.01
150	160	0.01	0
160	170	0.02	0.01

Table 8: Cumulative fine root mass as a function of depth (cm) at OSBS

Upper Depth	Lower Depth	Mean Cumulative (g per m^2)	Cumulative Std Dev
0	10	177.1	205.81
10	20	275.73	274.98
20	30	436.34	394.37
30	40	507.11	456.76
40	50	528.38	475.39
50	60	550.25	478.45
60	70	568.64	484
70	80	581.06	480.52
80	90	586.05	477.76
90	100	590.79	478.95
100	110	592.99	477.57
110	120	608.37	472.38
120	130	610.74	471.31
130	140	617.13	468.68
140	150	618.57	468.32
150	160	619.19	468.32
160	170	620.72	467.43

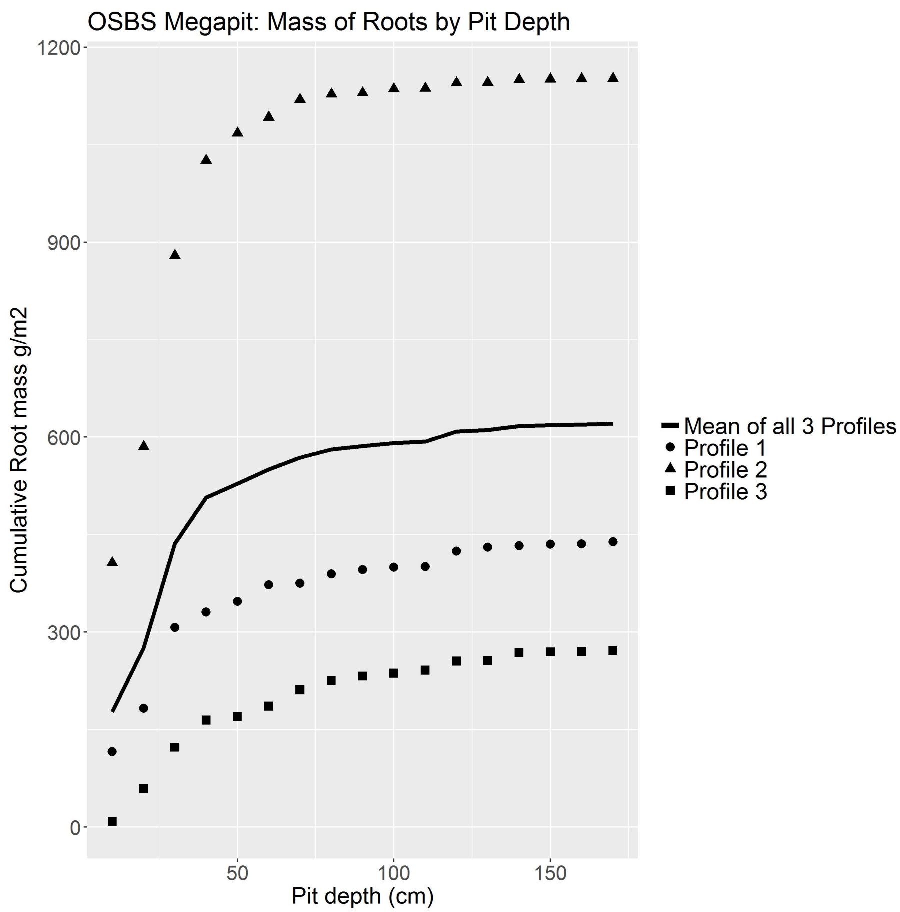

Figure 7: Cumulative root mass by pit depth at OSBS

Table 9: Fine root biomass sampling summary data at OSBS

Total Pit Depth (cm)	170
Total Mean Cumulative Mass at 30cm (g per m^2)	436.34
Total Mean Cumulative Mass at 100cm (g per m^2)	590.79
Total Mean Cumulative Mass (g per m^2)	620.72

4.4 Plant Characterization and Phenology Species Selection

4.4.1 Site-Specific Methods

Plant characterization data were collected by an external contractor during the summer of July 2013. Plant characterization data informs sampling procedures for plant phenology and plant productivity protocols.

The overall ranking ("Rank" in the table below) was calculated based on three separate measurements. Overall ranking weights are influenced by the number of species within each grouping.

1. Mean percent cover values were calculated based on species specific cover estimation for all plant species under 3m tall in eight 1m by 1m subplots per plot; see the TOS Protocol and Procedure: Plant Diversity Sampling (RD[09]) for more information.
2. Mean canopy area values were calculated based on all species specific shrub canopy diameter measurements within the entire plot or subplot; see the TOS Protocol and Procedure: Measurement of Vegetation Structure (RD[10]) for more information.
3. Mean ABH (area at breast height) measurements were calculated based on diameter at breast height measurements for all woody vegetation with a diameter greater than 1cm at 130cm height within the entire plot or subplot; see the TOS Protocol and Procedure: Measurement of Vegetation Structure (RD[10]) for more information.

The standard field methods and ranking calculations are further outlined in TOS Site Characterization Methods (RD[6]). For more information on this protocol and data product numbers see Appendix A.

4.4.2 Results

Table 10: Site plant characterization and phenology species summary at OSBS

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
QULA2	*Quercus laevis* Walter	1	9	NA	2.22
DIVI5	*Diospyros virginiana* L.	10	<1	NA	NA
GARE2	*Galactia regularis* (L.) Britton, Sterns & Poggenb.	11	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
CHFL2	*Chapmannia floridana* Torr. & A. Gray	12	<1	NA	NA
ARPU8	*Aristida purpurascens* Poir.	13	<1	NA	NA
SPJU	*Sporobolus junceus* (P. Beauv.) Kunth	14	<1	NA	NA
TEVI	*Tephrosia virginiana* (L.) Pers.	15	<1	NA	NA
DIAC	*Dichanthelium aciculare* (Desv. ex Poir.) Gould & C.A. Clark	16	<1	NA	NA
SCSC	*Schizachyrium scoparium* (Michx.) Nash	17	<1	NA	NA
LITE6	*Liatris tenuifolia* Nutt.	18	<1	NA	NA
TRAM7	*Triplasis americana* P. Beauv.	19	<1	NA	NA
PIPA2	*Pinus palustris* Mill.	2	3	NA	5.86
CRAR2	*Croton argyranthemus* Michx.	20	<1	NA	NA
VAAR	*Vaccinium arboreum* Marshall	21	<1	NA	NA
ARMO3	*Aristida mohrii* Nash	22	<1	NA	NA
TRUR	*Tragia urens* L.	23	<1	NA	NA
AGFI2	*Agalinis filifolia* (Nutt.) Raf.	24	<1	NA	NA
BUWA	*Bulbostylis warei* (Torr.) C.B. Clarke	25	<1	NA	NA
CYRE5	*Cyperus retrorsus* Chapm.	25	<1	NA	NA
QUGE2	*Quercus geminata* Small	27	<1	NA	0.1
BUCI	*Bulbostylis ciliatifolia* (Elliott) Fernald	28	<1	NA	NA
RHCI3	*Rhynchosia cinerea* Nash	29	<1	NA	NA
STAB	*Stylisma abdita* Myint	29	<1	NA	NA
ARBE7	*Aristida beyrichiana* Trin. & Rupr.	3	5	NA	NA
STSY	*Stillingia sylvatica* L.	31	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
ERTO2	*Eriogonum tomentosum* Michx.	32	<1	NA	NA
PTAQ	*Pteridium aquilinum* (L.) Kuhn	32	<1	NA	NA
AGJU2	*Ageratina jucunda* (Greene) Clewell & Woot.	34	<1	NA	NA
ANFL	*Andropogon floridanus* Scribn.	34	<1	NA	NA
DYOB	*Dyschoriste oblongifolia* (Michx.) Kuntze	34	<1	NA	NA
PAPA16	*Paronychia patula* Shinners	34	<1	NA	NA
CRRO5	*Crotalaria rotundifolia* Walter ex J.F. Gmel.	38	<1	NA	NA
BAAN3	*Balduina angustifolia* (Pursh) B.L. Rob.	39	<1	NA	NA
COER	*Commelina erecta* L.	39	<1	NA	NA
STSE3	*Stipulicida setacea* Michx.	39	<1	NA	NA
LIMI5	*Licania michauxii* Prance	4	2	NA	NA
CNURS	*Cnidoscolus urens* (L.) Arthur var. *stimulosus* (Michx.) Govaerts	42	<1	NA	NA
CLMA4	*Clitoria mariana* L.	43	<1	NA	NA
PASE5	*Paspalum setaceum* Michx.	43	<1	NA	NA
RHCO	*Rhus copallinum* L.	43	<1	NA	NA
TEFL	*Tephrosia florida* (F.G. Dietr.) C.E. Wood	43	<1	NA	NA
ANGY2	*Andropogon gyrans* Ashe	47	<1	NA	NA
OPHU	*Opuntia humifusa* (Raf.) Raf.	47	<1	NA	NA
STBI2	*Stylosanthes biflora* (L.) Britton, Sterns & Poggenb.	47	<1	NA	NA
DAPI2	*Dalea pinnata* (J.F. Gmel.) Barneby	5	2	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
ANTE2	*Andropogon ternarius* Michx.	50	<1	NA	NA
CACO37	*Carphephorus corymbosus* (Nutt.) Torr. & A. Gray	50	<1	NA	NA
CAGR25	*Callisia graminea* (Small) G. Tucker	50	<1	NA	NA
LEDE4	*Lechea deckertii* Small	50	<1	NA	NA
SCCI	*Scleria ciliata* Michx.	54	<1	NA	NA
STPA8	*Stylisma patens* (Desr.) Myint	54	<1	NA	NA
LEHI2	*Lespedeza hirta* (L.) Hornem.	56	<1	NA	NA
ORLU3	*Orbexilum lupinellum* (Michx.) Isely	56	<1	NA	NA
PAIN8	*Palafoxia integrifolia* (Nutt.) Torr. & A. Gray	56	<1	NA	NA
ARSE3	*Aristolochia serpentaria* L.	59	<1	NA	NA
CYCR6	*Cyperus croceus* Vahl	59	<1	NA	NA
DICHA2	*Dichanthelium* sp.	59	<1	NA	NA
MIMI22	*Mimosa microphylla* Dryand.	59	<1	NA	NA
QUHE2	*Quercus hemisphaerica* W. Bartram ex Willd.	59	<1	NA	NA
RHME	*Rhynchospora megalocarpa* A. Gray	59	<1	NA	NA
YUFI	*Yucca filamentosa* L.	59	<1	NA	NA
TECH	*Tephrosia chrysophylla* Pursh	6	1	NA	NA
ARFL2	*Arnoglossum floridanum* (A. Gray) H. Rob.	66	<1	NA	NA
GYAM	*Gymnopogon ambiguus* (Michx.) Britton, Sterns & Poggenb.	66	<1	NA	NA
LYAP3	*Lygodesmia aphylla* (Nutt.) DC.	66	<1	NA	NA
PHAR14	*Physalis arenicola* Kearney	66	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
RHGR2	*Rhynchospora grayi* Kunth	66	<1	NA	NA
SOSE5	*Sorghastrum secundum* (Elliott) Nash	7	<1	NA	NA
ASTO	*Asclepias tomentosa* Elliott	71	<1	NA	NA
CRMI8	*Croton michauxii* G.L. Webster	71	<1	NA	NA
CYLU2	*Cyperus lupulinus* (Spreng.) Marcks	71	<1	NA	NA
PHGR12	*Phoebanthus grandiflorus* (Torr. & A. Gray) S.F. Blake	71	<1	NA	NA
RHRE	*Rhynchosia reniformis* DC.	71	<1	NA	NA
RUCAC	*Ruellia caroliniensis* (J.F. Gmel.) Steud. ssp. *ciliosa* (Pursh) R.W. Long	71	<1	NA	NA
SETO7	*Sericocarpus tortifolius* (Michx.) Nees	71	<1	NA	NA
SMAU	*Smilax auriculata* Walter	71	<1	NA	NA
AUPE	*Aureolaria pectinata* (Nutt.) Pennell	79	<1	NA	NA
COCA5	*Conyza canadensis* (L.) Cronquist	79	<1	NA	NA
CYPER	*Cyperus* sp.	79	<1	NA	NA
HIME	*Hieracium megacephalon* Nash	79	<1	NA	NA
SCSA	*Schizachyrium sanguineum* (Retz.) Alston	79	<1	NA	NA
TOPU2	*Toxicodendron pubescens* Mill.	79	<1	NA	NA
VAMY3	*Vaccinium myrsinites* Lam.	79	<1	NA	NA
ASIN12	*Asimina incana* (W. Bartram) Exell	8	<1	NA	NA
PIGR4	*Pityopsis graminifolia* (Michx.) Nutt.	9	<1	NA	NA

Note: Taxon IDs and scientific names are based on the USDA Plants database (plants.usda.gov). Plants identified as *Mimosa microphylla* are likely misidentified *M. quadrivalvis*. Plants identified as *Lechea deckertii* are likely misidentified *L. minor*, *L. sessilflora*, or *L. mucronata*. Plants identified as *Toxicodendron pubescens* are likely misidentified *T. radicans*.

Table 11: Per plot breakdown of species richness, diversity, and herbaceous cover at OSBS

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover
OSBS_025	17	2.4	36
OSBS_026	25	2.9	86
OSBS_027	22	2.76	55
OSBS_028	33	3.19	91
OSBS_029	21	2.84	35
OSBS_030	30	3.01	88
OSBS_031	19	2.35	89
OSBS_032	17	2.73	26
OSBS_033	23	2.68	47
OSBS_034	16	2.59	33
OSBS_035	39	3.3	125
OSBS_036	16	2.23	54
OSBS_037	30	2.9	134
OSBS_038	21	2.7	62
OSBS_039	23	2.71	69
OSBS_040	22	2.78	39
OSBS_041	26	2.81	76
OSBS_042	28	3.16	69
OSBS_043	23	2.04	74
OSBS_044	21	2.41	59

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

Bryophyte percent cover data were used to determine which sites qualify for implementation of the Bryophyte Productivity protocol. However, bryophyte productivity sampling was discontinued in 2018 and NEON no longer implements this protocol. No bryophyte cover was recorded in OSBS Tower Base Plots.

4.5 Beetles

4.5.1 Site-Specific Methods

Beetle site characterization was conducted in August and September 2012 by NEON staff following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Beetle site characterization data were collected to start site level teaching collections. 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.

4.5.2 Results

Table 12: Beetle trap locations at OSBS

Trap ID	Lat	Long
1	29.69675	-82.02558
2	29.68679	-81.983002
3	29.67829934	-82.00368121
4	29.72783678	-81.96789448
5	29.6909	-81.9759
6	29.7297	-81.9738
7	29.7004	-82.0188
8	29.68721334	-81.96967652
9	29.697	-81.994

Table 13: Beetle identification results at OSBS

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
7162	*Pasimachus punctulatus*		9/5/2012	7
7161	*Pasimachus punctulatus*		8/1/2012	9
7160	*Pasimachus punctulatus*		9/5/2012	5
7159	*Pasimachus punctulatus*		8/1/2012	2
7158	*Pasimachus punctulatus*		8/29/2012	9
7157	*Pasimachus punctulatus*		8/29/2012	5
7156	*Pasimachus punctulatus*		9/5/2012	7
7155	*Pasimachus punctulatus*		8/1/2012	2
7154	*Pasimachus punctulatus*		8/22/2012	2
7153	*Pasimachus punctulatus*		8/8/2012	3

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
7152	*Pasimachus punctulatus*		8/8/2012	3
7151	*Pasimachus punctulatus*		9/5/2012	5
7150	*Pasimachus punctulatus*		8/15/2012	2
7149	*Pasimachus punctulatus*		8/1/2012	5
7148	*Pasimachus punctulatus*		8/1/2012	2
7147	*Pasimachus punctulatus*		8/15/2012	5
7146	*Pasimachus punctulatus*		8/8/2012	2
7145	*Pasimachus punctulatus*		8/8/2012	5
7144	*Pasimachus punctulatus*		9/5/2012	5
7143	*Pasimachus punctulatus*		9/5/2012	7
7004	*Pasimachus sublaevis*		8/29/2012	1
7003	*Pasimachus sublaevis*		9/5/2012	1
7002	*Pasimachus sublaevis*		8/29/2012	1
7001	*Pasimachus sublaevis*		8/15/2012	1
7000	*Pasimachus sublaevis*		8/22/2012	1
6067	*Pasimachus punctulatus*		8/8/2012	2
6066	*Pasimachus punctulatus*		9/5/2012	5
6065	*Pasimachus punctulatus*		8/22/2012	2
6064	*Pasimachus punctulatus*		8/1/2012	3
6063	*Pasimachus punctulatus*		9/5/2012	2
6062	*Pasimachus punctulatus*		8/1/2012	5
6061	*Pasimachus punctulatus*		8/1/2012	2
6060	*Pasimachus punctulatus*		8/1/2012	2
6059	*Pasimachus punctulatus*		8/1/2012	1
6058	*Pasimachus punctulatus*		8/29/2012	5
6057	*Pasimachus sublaevis*		8/29/2012	1
6056	*Pasimachus sublaevis*		8/22/2012	1
6055	*Pasimachus sublaevis*		8/15/2012	1
6054	*Pasimachus subsulcatus*		8/15/2012	9
6053	*Pasimachus subsulcatus*		8/22/2012	6
6052	*Pasimachus subsulcatus*		8/8/2012	5
6051	*Pasimachus subsulcatus*		8/8/2012	2
6050	*Pasimachus subsulcatus*		8/15/2012	5
6049	Unknown	D03.2012.MorphOB	8/15/2012	8

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
6048	Unknown	D03.2012.MorphOB	8/15/2012	8
6047	Unknown	D03.2012.MorphOA	8/29/2012	4

4.6 Mosquitoes

4.6.1 Site-Specific Methods

Mosquito site characterization was conducted in June and July 2010 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. 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.

4.6.2 Results

Table 14: Mosquito trap locations at OSBS

Trap ID	Lat	Long
1	29.697	-82.026
2	29.7	-82.019
3	29.678	-82.004
4	29.697	-81.994
5	29.687	-81.983
6	29.691	-81.976
7	29.73	-81.974
8	29.728	-81.968
9	29.692	-81.959

Note: Trap locations were recorded to only three decimal places, thus introducing mapping error. No sampling occurred outside of the permitted boundary.

Table 15: Mosquito identification results at OSBS

BOLD Sample ID	Scientific Name	Collection Date	Trap Location
NEONTculicid6239	*Aedes triseriatus*	7/26/2012	1
NEONTculicid6258	*Aedes fulvus pallens*	7/25/2012	1
NEONTculicid6416	*Psorophora ferox*	7/25/2012	1

BOLD Sample ID	Scientific Name	Collection Date	Trap Location
NEONTculicid6257	*Aedes fulvus pallens*	7/25/2012	1
NEONTculicid6385	*Psorophora ferox*	9/5/2012	1
NEONTculicid6256	*Aedes fulvus pallens*	7/25/2012	1
NEONTculicid6275	*Psorophora ferox*	7/25/2012	1
NEONTculicid6253	*Psorophora howardii*	9/5/2012	1
NEONTculicid6250	*Psorophora howardii*	9/5/2012	1
NEONTculicid6251	*Psorophora howardii*	9/5/2012	1
NEONTculicid6249	*Psorophora howardii*	9/5/2012	1
NEONTculicid6246	*Psorophora howardii*	9/5/2012	1
NEONTculicid6247	*Psorophora howardii*	9/5/2012	1
NEONTculicid6262	*Aedes atlanticus*	7/25/2012	1
NEONTculicid6245	*Psorophora howardii*	9/5/2012	1
NEONTculicid6255	*Aedes fulvus pallens*	7/25/2012	1
NEONTculicid6263	*Aedes atlanticus*	7/25/2012	1
NEONTculicid6259	*Aedes fulvus pallens*	7/25/2012	1
NEONTculicid6254	*Psorophora howardii*	9/5/2012	1
NEONTculicid6248	*Psorophora howardii*	9/5/2012	1
NEONTculicid6252	*Psorophora howardii*	9/5/2012	1
NEONTculicid6242	*Aedes triseriatus*	7/25/2012	2
NEONTculicid6241	*Aedes triseriatus*	7/25/2012	2
NEONTculicid6236	*Aedes triseriatus*	7/26/2012	2
NEONTculicid6238	*Aedes triseriatus*	7/26/2012	2
NEONTculicid6237	*Aedes hendersoni*	7/26/2012	2
NEONTculicid6243	*Aedes triseriatus*	7/25/2012	3
NEONTculicid6314	*Aedes atlanticus*	9/6/2012	4
NEONTculicid6240	*Aedes triseriatus*	7/26/2012	4
NEONTculicid6351	*Aedes mitchellae*	9/5/2012	5
NEONTculicid6274	*Culex coronator*	9/5/2012	5
NEONTculicid6273	*Culex coronator*	9/5/2012	6
NEONTculicid6218	*Uranotaenia sapphirina*	9/25/2012	7
NEONTculicid6215	*Uranotaenia sapphirina*	9/25/2012	7
NEONTculicid6217	*Uranotaenia sapphirina*	9/25/2012	7
NEONTculicid6235	*Aedes triseriatus*	9/26/2012	7
NEONTculicid6216	*Uranotaenia sapphirina*	9/25/2012	7

BOLD Sample ID	Scientific Name	Collection Date	Trap Location
NEONTculicid6276	*Culex tarsalis*	7/25/2012	8
NEONTculicid6281	*Culex salinarius*	9/25/2012	8
NEONTculicid6214	*Culex salinarius*	9/25/2012	8
NEONTculicid6279	*Culex salinarius*	9/25/2012	8
NEONTculicid6280	*Culex salinarius*	9/25/2012	8
NEONTculicid6261	*Culex erraticus*	7/25/2012	9
NEONTculicid6267	*Aedes infirmatus*	7/25/2012	9
NEONTculicid6260	*Culex erraticus*	7/25/2012	9
NEONTculicid6268	*Aedes infirmatus*	7/25/2012	9
NEONTculicid6265	*Psorophora columbiae*	7/25/2012	9
NEONTculicid6271	*Aedes mitchellae*	7/25/2012	9
NEONTculicid6414	*Psorophora columbiae*	7/25/2012	9
NEONTculicid6264	*Psorophora columbiae*	7/25/2012	9
NEONTculicid6272	*Aedes mitchellae*	7/25/2012	9
NEONTculicid6270	*Aedes mitchellae*	7/25/2012	9
NEONTculicid6266	*Psorophora columbiae*	7/25/2012	9
NEONTculicid6244	*Aedes triseriatus*	7/25/2012	9
NEONTculicid6411	*Uranotaenia sapphirina*	9/6/2012	9
NEONTculicid6269	*Aedes infirmatus*	7/25/2012	9
NEONTculicid6586	*Culex erraticus*	7/25/2012	9
NEONTculicid6590	*Aedes infirmatus*	7/25/2012	9

4.7 Ticks

4.7.1 Site-Specific Methods

Tick drags were conducted at OSBS in the spring and summer of 2012 to test protocol methods and calculate capture rates. No tick identification or pathogen testing was performed. For more information on this protocol and data product numbers see Appendix A.

4.7.2 Results

Table 16: Tick sampling results at OSBS

Vegetation Type	Number of Plots Sampled	Tick Abundance (Mean)	Tick Abundance (stDev)	Total Number of Ticks Collected	Max Number of Ticks Collected	Number of Plots With No Ticks	Total Area Sampled (m^2)
Evergreen open tree canopy	3	20	17.1	60	39	0	811
Mixed evergreen/deciduous open tree canopy	14	0.2	0.6	3	2	12	6156
Perennial graminoid grassland	5	1.2	1.8	6	4	3	1615
Total	22	3.1	8.7	69	39	15	8582

Note: Land cover classes here match LANDFIRE (Landscape Fire and Resource Management Planning Tools; http://www.landfire.gov/) vegetation categories, rather than NLCD land cover types employed in current protocols.

4.8 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[06], RD[07]).

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.

Dodd, C.K., Jr. 1992. Biological diversity of a temporary pond herpetofauna in north Florida sandhills. Biodiversity and Conservation. 1: 125-142.

Dodd, C.K., Jr. 1995. Reptiles and amphibians in the endangered longleaf pine ecosystem. Pp. 129-131 In: E.T. LaRoe, G.S. Farris, C.E. Puckett, P.D. Doran and M.J. Mac (eds.). Our Living Resources, National Biological Service, Washington, D.C.

"Flora and DNA Barcoding of Ordway-Swisher Biological Station." University of Florida Herbarium Digital Imaging Projects. University of Florida Herbarium. 31 March 2016. Web. 20 Sep 2016.

Franz, R., Hall, D.W. (1991): Vegetative communities and annotated plant lists for the Katharine Ordway Preserve-Swisher Memorial Sanctuary, Putnam County, Florida. Ordway Preserve Series,Report 3.

5 RELOCATABLE SITE 1- DISNEY WILDERNESS PRESERVE (DSNY)

The 12,000-acre (49 km^2) Disney Wilderness Preserve (DSNY) straddles the headwaters of the Everglades ecosystem in south-central Florida. This site is seasonally wet and flooded. Data from DSNY support greater understanding of wetland regeneration, water storage and quality, and predictive models for future large-scale restorations.

Figure 8: Phenocamera image for DSNY. The phenocamera is located at the top of the NEON tower and faces north. Phenocamera images are available at https://phenocam.sr.unh.edu/webcam/network/table/.

Key Characteristics:

- Site host: The Nature Conservancy
- Located in Polk and Osceola Counties, Florida
- Sampling Area: 49 km^2
- Plot Elevation: 16-22 m
- Dominant vegetation type- The dominant ecosystem type is restored wet prairie with regenerating pine; vegetation cover at Disney site is primarily restored broom sedge prairie, interspersed with perennial grasses. The Disney site is composed of short gasses, interspersed with pine saplings. Dominant vegetation types within the Disney Wilderness Preserve include:
  - Pine Flatwoods

  - Southern Coastal Plain Non-riverine Cypress Dome
  - Florida Dry Prairie
- The dominant perennial grass at the site is wiregrass (*Aristida stricta* Michx.), with numerous other species of perennial grasses also present, including:
  - *Andropogon* sp.
  - Bottlebrush threeawn (*Aristida spiciformis*)
  - Broom sedge (*Andropogon virginicus*)
- General management: The Disney site was heavily logged and used as ranchland for decades. However, vegetation and site conditions have been restored to closely represent site condition records, documented by the area's first Spanish missionaries. The large-scale wetland and upland restoration at Disney included the removal of non-native, invasive plants and grasses and the removal of agricultural ditches. The primary management activity is controlled burns.
- 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 Disney Wilderness Preserve 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. TOS Tower Plots were allocated according to a spatially balanced design in and around the NEON tower airshed (RD[03]). 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.

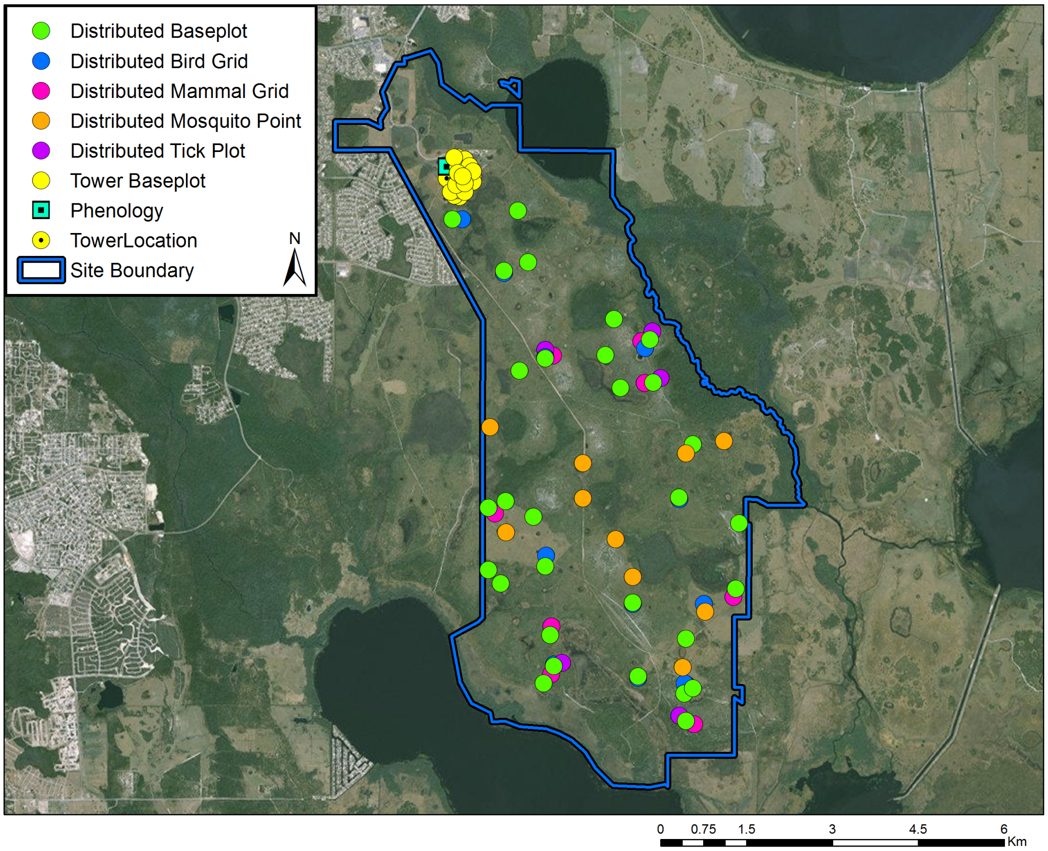

Figure 9: Map of TOS plot centroids within the NEON TOS sampling boundary at DSNY

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

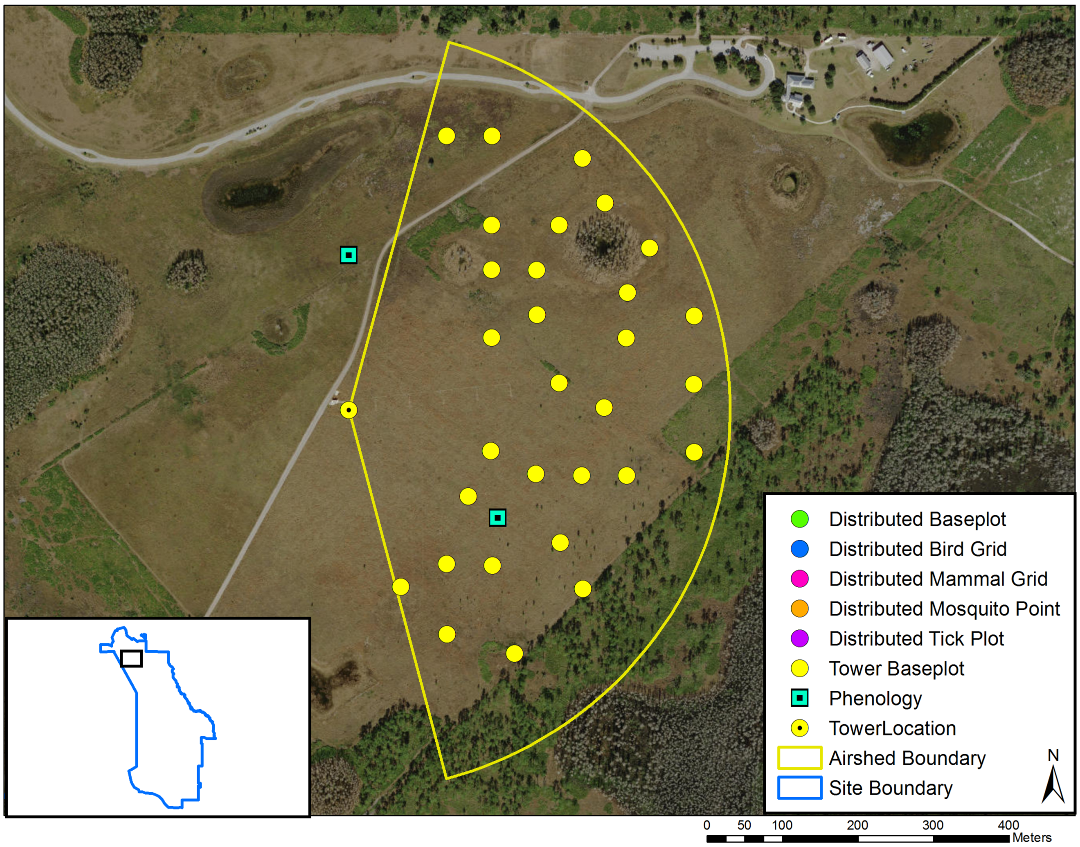

Figure 10: Map of the tower airshed and TOS centroids at DSNY

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

Table 17: NLCD land cover classes and area within the TOS site boundary at DSNY

NLCD Class	Site Area (km^2)	Percent (%)
Woody Wetlands	39.58	81.5
Pasture Hay	3.99	8.22
Emergent Herbaceous Wetlands	2.33	4.79
Shrub Scrub	0.78	1.61
Open Water	0.69	1.43
Grassland Herbaceous	0.7	1.43
Developed Open Space	0.48	1
Developed Low Intensity	0.01	0.03

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 18: NLCD land cover classes and TOS plot numbers at DSNY

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Base Plot	Woody Wetlands	23
Distributed	Base Plot	Pasture Hay	7
Distributed	Bird Grid	Woody Wetlands	8
Distributed	Bird Grid	Pasture Hay	3
Distributed	Mammal Grid	Woody Wetlands	6
Distributed	Mammal Grid	Pasture Hay	3
Distributed	Mosquito Point	Woody Wetlands	7
Distributed	Mosquito Point	Pasture Hay	3
Distributed	Tick Plot	Woody Wetlands	5
Distributed	Tick Plot	Pasture Hay	1
Tower	Base Plot	NA	30
Tower	Phenology Plot	NA	2

Note: NLCD land cover classes are not used to stratify Tower Plots which are located in and around the NEON tower airshed. The dominant NLCD land cover type within the airshed is pasture hay and shrub scrub.

Table 19: Number of Distributed Base plots per NLCD land cover class per protocol at DSNY.

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Pasture Hay	Beetles	3
Distributed	Base Plot	Woody Wetlands	Beetles	7
Distributed	Base Plot	Pasture Hay	Canopy Foliage Chemistry	1
Distributed	Base Plot	Woody Wetlands	Canopy Foliage Chemistry	9
Distributed	Base Plot	Pasture Hay	Coarse Downed Wood	5
Distributed	Base Plot	Woody Wetlands	Coarse Downed Wood	15
Distributed	Base Plot	Pasture Hay	Digital Hemispherical Photos for Leaf Area Index	5
Distributed	Base Plot	Woody Wetlands	Digital Hemispherical Photos for Leaf Area Index	15
Distributed	Base Plot	Pasture Hay	Herbaceous Biomass	5
Distributed	Base Plot	Woody Wetlands	Herbaceous Biomass	15
Distributed	Base Plot	Pasture Hay	Plant Diversity	7
Distributed	Base Plot	Woody Wetlands	Plant Diversity	23

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Pasture Hay	Soil Biogeochemistry	1
Distributed	Base Plot	Woody Wetlands	Soil Biogeochemistry	5
Distributed	Base Plot	Pasture Hay	Soil Microbes	1
Distributed	Base Plot	Woody Wetlands	Soil Microbes	5
Distributed	Base Plot	Pasture Hay	Vegetation Structure	5
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 20: Number of Tower Plots per protocol at DSNY

Plot Type	Plot Subtype	Protocols	Number of Plots
Tower	Base Plot	Canopy Foliage Chemistry	4
Tower	Base Plot	Coarse Downed Wood	30
Tower	Base Plot	Digital Hemispherical Photos for Leaf Area Index	3
Tower	Base Plot	Herbaceous Biomass	30
Tower	Base Plot	Litterfall and Fine Woody Debris	30
Tower	Base Plot	Plant Belowground Biomass	30
Tower	Base Plot	Plant Diversity	3
Tower	Base Plot	Soil Biogeochemistry	4
Tower	Base Plot	Soil Microbes	4
Tower	Base Plot	Vegetation Structure	30
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 Sampling Season Characterization: DSNY

For numerous TOS protocols, the length of the sampling season, the number of bouts, and when those bouts occur is dictated by the seasonal status of the plant community. By monitoring 'greenness' on a 16 day interval, the MODIS/Terra EVI phenology product provides consistent, reliable insight into plant community phenology and intensity at the continental scale. For those protocols for which timing is standardized by greenness transitions and/or peak green status, NEON has utilized these data as the primary means of guiding temporal aspects of TOS sampling at each site.

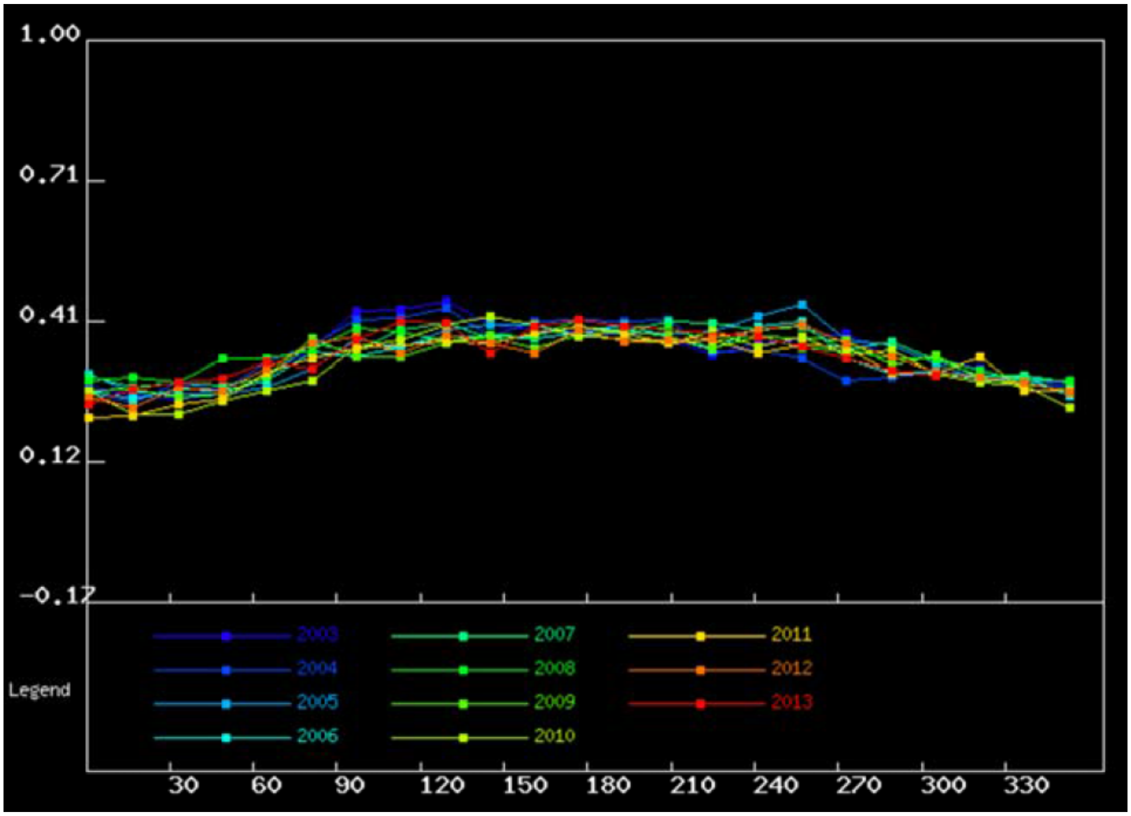

Figure 11: MODIS-EVI greenness (y-axis = EVI ratio) as a function of time (x-axis = DOY) for the years 2003-2013 at the NEON DSNY site.

Table 21: Average MODIS-EVI greenness dates for the NEON DSNY site, based on data from 2003-2013 (DOY, with MM/DD in parentheses).

Average Increase	Average Maximum	Average Decrease	Average Minimum
60 (03/02)	140 (05/21)	190 (07/10)	320 (11/17)

MODIS Product Details

- Product: MODIS-EVI phenology product, 16 day interval, 250 m grid, data included from all pixels with acceptable quality within user-defined square that roughly overlaps the TOS site boundary.
- Date range: 2003-2013
- User selected area: 24.25 km x 24.25 km box, centroid Latitude: 28.12504, Longitude: -81.4362 (WGS84 datum)

5.3 Belowground Biomass

5.3.1 Site-Specific Methods

Belowground biomass characterization data were collected down to a depth of 120 cm by NEON staff in February 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[8]) for more information. Samples were collected following the standard methods outlined in TOS Site Characterization Methods (RD[6]). A bulk density soil corer and soil knife were used to extract soil to test out protocols methods. Roots were sorted by diameter size (less than or greater than two mm) and 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.

5.3.2 Results

Table 22: Soil Pit Information at DSNY.

Latitude	Longitude	Soil Family	Soil Order
28.12919	-81.43394	Sandy - siliceous - hyperthermic Aeric Alaquods	Spodosol

Soil Profile was described by Natural Resource Conservation Service (NRCS).

Table 23: Fine root mass per depth increment (cm) at DSNY

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
0	10	2.3	0.94
10	20	0.92	0.16
20	30	0.72	0.28
30	40	0.78	0.15
40	50	0.38	0.16
50	60	0.16	0.14
60	70	0.07	0.05
70	80	0.11	0.11
80	90	0.04	0.03
90	100	0.05	0.05
100	120	0.03	0.01

Table 24: Cumulative fine root mass as a function of depth (cm) at DSNY

Upper Depth	**Lower Depth**	**Mean Cumulative (g per m^2)**	**Cumulative Std Dev**
0	10	229.84	93.84
10	20	322.23	79.11
20	30	394.45	90.54
30	40	472.64	77.19
40	50	510.42	73.29
50	60	526.86	74.3
60	70	533.64	76.2
70	80	544.54	84.79
80	90	548.25	86.16
90	100	553.29	88
100	120	559.65	88.48

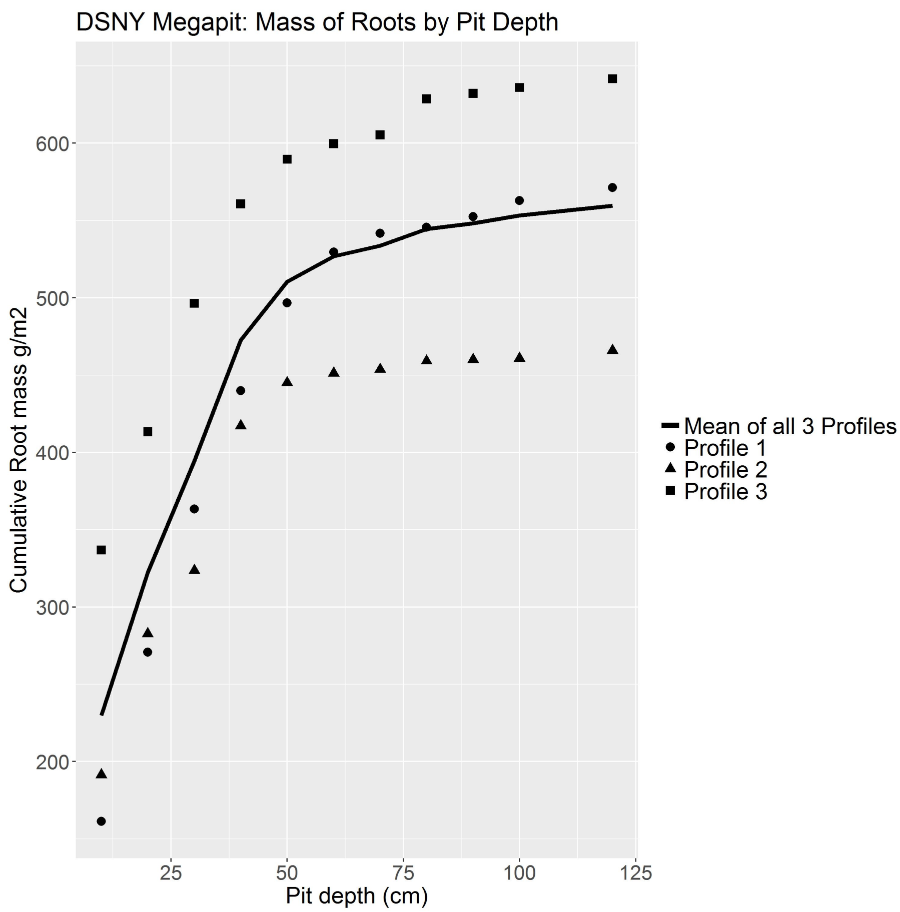

Figure 12: Cumulative root mass by pit depth at DSNY

Table 25: Fine root biomass sampling summary data at DSNY

Total Pit Depth (cm)	120
Total Mean Cumulative Mass at 30cm (g per m^2)	394.45
Total Mean Cumulative Mass at 100cm (g per m^2)	553.29
Total Mean Cumulative Mass (g per m^2)	559.65

5.4 Plant Characterization and Phenology Species Selection

5.4.1 Site-Specific Methods

Plant characterization data were collected by an external contractor and NEON technicians during the summer of July 2013. Plant characterization data informs sampling procedures for plant phenology and plant productivity protocols.

The overall ranking ("Rank" in the table below) was calculated based on three separate measurements. Overall ranking weights are influenced by the number of species within each grouping.

1. Mean percent cover values were calculated based on species specific cover estimation for all plant species under 3m tall in eight 1m by 1m subplots per plot; see the TOS Protocol and Procedure: Plant Diversity Sampling (RD[09]) for more information.
2. Mean canopy area values were calculated based on all species specific shrub canopy diameter measurements within the entire plot or subplot; see the TOS Protocol and Procedure: Measurement of Vegetation Structure (RD[10]) for more information.
3. Mean ABH (area at breast height) measurements were calculated based on diameter at breast height measurements for all woody vegetation with a diameter greater than 1cm at 130cm height within the entire plot or subplot; see the TOS Protocol and Procedure: Measurement of Vegetation Structure (RD[10]) for more information.

The standard field methods and ranking calculations are further outlined in TOS Site Characterization Methods (RD[6]). For more information on this protocol and data product numbers see Appendix A.

5.4.2 Results

Table 26: Site plant characterization and phenology species summary at DSNY

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
ANVI2	*Andropogon virginicus* L.	1	24	NA	NA
SOSE5	*Sorghastrum secundum* (Elliott) Nash	10	2	NA	NA
QUVI	*Quercus virginiana* Mill.	104	<1	NA	NA
CHNIN2	*Chamaecrista nictitans* (L.) Moench var. *nictitans* (L.) Moench var. nictitans	105	<1	NA	NA
CYSU	*Cyperus surinamensis* Rottb.	105	<1	NA	NA
LACA	*Lactuca canadensis* L.	105	<1	NA	NA
LERE2	*Lespedeza repens* (L.) W.P.C. Barton	105	<1	NA	NA
LUDE4	*Ludwigia decurrens* Walter	105	<1	NA	NA
LYAP3	*Lygodesmia aphylla* (Nutt.) DC.	105	<1	NA	NA
MISE3	*Mitreola sessilifolia* (J.F. Gmel.) G. Don	105	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
OXCO	*Oxalis corniculata* L.	105	<1	NA	NA
PHNO2	*Phyla nodiflora* (L.) Greene	105	<1	NA	NA
POLU	*Polygala lutea* L.	105	<1	NA	NA
PSOB3	*Pseudognaphalium obtusifolium* (L.) Hilliard & B.L. Burtt	105	<1	NA	NA
SCBA2	*Scleria baldwinii* (Torr.) Steud.	105	<1	NA	NA
TEHI2	*Tephrosia hispidula* (Michx.) Pers.	105	<1	NA	NA
AXFI	*Axonopus fissifolius* (Raddi) Kuhlm.	11	2	NA	NA
MOCE2	*Morella cerifera* (L.) Small	118	<1	NA	NA
PIPA2	*Pinus palustris* Mill.	119	<1	NA	NA
ANGL10	*Andropogon glaucopsis* Elliott	12	2	NA	NA
LYFR3	*Lyonia fruticosa* (Michx.) G.S. Torr.	120	<1	NA	NA
RHCO	*Rhus copallinum* L.	121	<1	NA	NA
HYTE11	*Hypericum tenuifolium* Pursh	122	<1	NA	NA
HYHY	*Hypericum hypericoides* (L.) Crantz	123	<1	NA	NA
CYRE5	*Cyperus retrorsus* Chapm.	13	1	NA	NA
EUCA5	*Eupatorium capillifolium* (Lam.) Small	14	1	NA	NA
CAVE8	*Carex verrucosa* Muhl.	15	1	NA	NA
PAHE2	*Panicum hemitomon* Schult.	16	1	NA	NA
CEER2	*Centella erecta* (L. f.) Fernald	17	<1	NA	NA
PALA10	*Paspalum laeve* Michx.	18	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
DIDIT	*Dichanthelium dichotomum* (L.) Gould var. *tenue* (Muhl.) Gould & C.A. Clark	19	<1	NA	NA
ARBE7	*Aristida beyrichiana* Trin. & Rupr.	2	14	NA	NA
PLRO	*Pluchea rosea* Godfrey	20	<1	NA	NA
JUMA4	*Juncus marginatus* Rostk.	21	<1	NA	NA
LUMA4	*Ludwigia maritima* Harper	22	<1	NA	NA
SAGI	*Saccharum giganteum* (Walter) Pers.	23	<1	NA	NA
SOFI	*Solidago fistulosa* Mill.	24	<1	NA	NA
ANGLP	*Andropogon glomeratus* (Walter) Britton, Sterns & Poggenb. var. *pumilus* Vasey ex L.H. Dewey	25	<1	NA	NA
CIHO2	*Cirsium horridulum* Michx.	26	<1	NA	NA
MISC	*Mikania scandens* (L.) Willd.	27	<1	NA	NA
RHMI7	*Rhynchospora microcarpa* Baldw. ex A. Gray	28	<1	NA	NA
ARPUT	*Aristida purpurascens* Poir. var. *tenuispica* (Hitchc.) Allred	29	<1	NA	NA
AXFU	*Axonopus furcatus* (Flueggé) Hitchc.	3	7	NA	NA
ERRE	*Eragrostis refracta* (Muhl.) Scribn.	30	<1	NA	NA
DISAP	*Dichanthelium sabulorum* (Lam.) Gould & C.A. Clark var. *patulum* (Scribn. & Merr.) Gould & C.A. Clark	31	<1	NA	NA
RHMA	*Rhexia mariana* L.	32	<1	NA	NA
PHAR14	*Physalis arenicola* Kearney	33	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
ANVID	*Andropogon virginicus* L. var. *decipiens* C.S. Campbell	34	<1	NA	NA
QUMI2	*Quercus minima* (Sarg.) Small	35	<1	NA	NA
ANBR2	*Andropogon brachystachyus* Chapm.	36	<1	NA	NA
OLUN	*Oldenlandia uniflora* L.	37	<1	NA	NA
HYCI	*Hypericum cistifolium* Lam.	38	<1	NA	NA
PRPE	*Proserpinaca pectinata* Lam.	39	<1	NA	NA
EUCA26	*Euthamia caroliniana* (L.) Greene ex Porter & Britton	4	6	NA	NA
ERHI2	*Erechtites hieraciifolia* (L.) Raf. ex DC.	40	<1	NA	NA
AMMU2	*Amphicarpum muehlenbergianum* (Schult.) Hitchc.	41	<1	NA	NA
RHCH2	*Rhynchospora chalarocephala* Fernald & Gale	42	<1	NA	NA
ASRE7	*Asimina reticulata* Shuttlw. ex Chapm.	43	<1	NA	NA
LUVI2	*Ludwigia virgata* Michx.	44	<1	NA	NA
CHNIN	*Chamaecrista nictitans* (L.) Moench ssp. *nictitans* (L.) Moench ssp. nictitans	45	<1	NA	NA
EREL	*Eragrostis elliottii* S. Watson	46	<1	NA	NA
JUDI	*Juncus dichotomus* Elliott	46	<1	NA	NA
CYPO	*Cyperus polystachyos* Rottb.	48	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
DISTG	*Dichanthelium strigosum* (Muhl. ex Elliott) Freckmann var. *glabrescens* (Griseb.) Freckmann	48	<1	NA	NA
DIVI3	*Diodia virginiana* L.	48	<1	NA	NA
POPR4	*Polypremum procumbens* L.	5	2	NA	NA
ELEL3	*Elephantopus elatus* Bertol.	51	<1	NA	NA
DISE3	*Digitaria serotina* (Walter) Michx.	52	<1	NA	NA
BAHA	*Baccharis halimifolia* L.	53	<1	NA	NA
HYAL	*Hyptis alata* (Raf.) Shinners	54	<1	NA	NA
BUAM	*Buchnera americana* L.	55	<1	NA	NA
HYMY	*Hypericum myrtifolium* Lam.	56	<1	NA	NA
LACA5	*Lachnanthes caroliana* (Lam.) Dandy	57	<1	NA	NA
PASE5	*Paspalum setaceum* Michx.	57	<1	NA	NA
DIDIE	*Dichanthelium dichotomum* (L.) Gould var. *ensifolium* (Baldw. ex Elliott) Gould & C.A. Clark	59	<1	NA	NA
DISC2	*Dichanthelium scabriusculum* (Elliott) Gould & C.A. Clark	59	<1	NA	NA
ERAGR	*Eragrostis* sp.	59	<1	NA	NA
SERE2	*Serenoa repens* (W. Bartram) Small	6	2	NA	NA
ARPU8	*Aristida purpurascens* Poir.	62	<1	NA	NA
CTAR	*Ctenium aromaticum* (Walter) Alph. Wood	63	<1	NA	NA
ELBA2	*Eleocharis baldwinii* (Torr.) Chapm.	63	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
PANO2	*Paspalum notatum* Flueggé	63	<1	NA	NA
SCDU3	*Scoparia dulcis* L.	63	<1	NA	NA
RHPU3	*Rhynchospora pusilla* Chapm. ex M.A. Curtis	67	<1	NA	NA
VILA4	*Viola lanceolata* L.	67	<1	NA	NA
LAAN	*Lachnocaulon anceps* (Walter) Morong	69	<1	NA	NA
PIGR4	*Pityopsis graminifolia* (Michx.) Nutt.	69	<1	NA	NA
SCSC	*Schizachyrium scoparium* (Michx.) Nash	7	2	NA	NA
TAAS	*Taxodium ascendens* Brongn.	71	<1	NA	NA
HYTE4	*Hypericum tetrapetalum* Lam.	72	<1	NA	NA
HYFA	*Hypericum fasciculatum* Lam.	73	<1	NA	NA
CINU	*Cirsium nuttallii* DC.	74	<1	NA	NA
CRRO5	*Crotalaria rotundifolia* Walter ex J.F. Gmel.	74	<1	NA	NA
SAGR8	*Sabatia grandiflora* (A. Gray) Small	74	<1	NA	NA
SAST	*Sacciolepis striata* (L.) Nash	74	<1	NA	NA
URLO	*Urena lobata* L.	74	<1	NA	NA
FIPU	*Fimbristylis puberula* (Michx.) Vahl	79	<1	NA	NA
JUSC	*Juncus scirpoides* Lam.	79	<1	NA	NA
WOVI	*Woodwardia virginica* (L.) Sm.	79	<1	NA	NA
GAEL2	*Galactia elliottii* Nutt.	8	2	NA	NA
EURO4	*Eupatorium rotundifolium* L.	82	<1	NA	NA
FUSC	*Fuirena scirpoidea* Michx.	82	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
HYMU	*Hypericum mutilum* L.	82	<1	NA	NA
SAIN	*Sacciolepis indica* (L.) Chase	82	<1	NA	NA
SAPA	*Sabal palmetto* (Walter) Lodd. ex Schult. & Schult. f.	86	<1	NA	NA
HEAN2	*Helianthus angustifolius* L.	87	<1	NA	NA
JUEF	*Juncus effusus* L.	87	<1	NA	NA
PASPA2	*Paspalum* sp.	87	<1	NA	NA
RUAR2	*Rubus argutus* Link	87	<1	NA	NA
DISAT	*Dichanthelium sabulorum* (Lam.) Gould & C.A. Clark var. *thinium* (Hitchc. & Chase) Gould & C.A. Clark	9	2	NA	NA
CHNI2	*Chamaecrista nictitans* (L.) Moench	91	<1	NA	NA
CHNIA	*Chamaecrista nictitans* (L.) Moench var. *aspera* (Muhl. ex Elliott) Irwin & Barneby	91	<1	NA	NA
COCA5	*Conyza canadensis* (L.) Cronquist	91	<1	NA	NA
COER	*Commelina erecta* L.	91	<1	NA	NA
FIAN	*Fimbristylis annua* (All.) Roem. & Schult.	91	<1	NA	NA
LUPA	*Ludwigia palustris* (L.) Elliott	91	<1	NA	NA
PARE3	*Panicum repens* L.	91	<1	NA	NA
PTPY2	*Pterocaulon pycnostachyum* (Michx.) Elliott	91	<1	NA	NA
RHFA	*Rhynchospora fascicularis* (Michx.) Vahl	91	<1	NA	NA
RHPL3	*Rhynchospora plumosa* Elliott	91	<1	NA	NA
RHYNC3	*Rhynchospora* sp.	91	<1	NA	NA
VAMY3	*Vaccinium myrsinites* Lam.	91	<1	NA	NA
XYEL2	*Xyris elliottii* Chapm.	91	<1	NA	NA

Note: Taxon IDs and scientific names are based on the USDA Plants database (plants.usda.gov).

Table 27: Per plot breakdown of species richness, diversity, and herbaceous cover at DSNY

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover
DSNY_041	24	2.63	172
DSNY_044	26	2.55	194
DSNY_047	20	2.18	166
DSNY_048	20	2.07	150
DSNY_050	29	2.33	136
DSNY_051	30	2.76	201
DSNY_052	33	2.74	178
DSNY_053	13	2.15	70
DSNY_055	26	2.2	134
DSNY_056	23	2.28	218
DSNY_058	26	2.47	249
DSNY_059	26	2.63	184
DSNY_060	32	2.59	155
DSNY_061	20	2.27	166
DSNY_063	31	2.78	199
DSNY_065	29	2.45	151
DSNY_066	12	1.99	49
DSNY_067	23	2.52	189
DSNY_068	22	2.52	182
DSNY_070	27	2.34	356

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

Bryophyte percent cover data were used to determine which sites qualify for implementation of the Bryophyte Productivity protocol. However, bryophyte productivity sampling was discontinued in 2018 and NEON no longer implements this protocol. No bryophyte cover was recorded in DSNY Tower Base Plots.

5.5 Beetles

5.5.1 Site-Specific Methods

Beetle site characterization was conducted in June and July 2012 by NEON staff following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Beetle site characterization data were collected to start site level teaching collections. 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.

5.5.2 Results

Table 28: Beetle trap locations at DSNY

Trap ID	Lat	Long
1	28.1251	-81.4328
2	28.1037	-81.4296
3	28.073299	-81.42856
4	28.0442	-81.4217
5	28.0639	-81.4185
6	28.0997	-81.4137
7	28.0997	-81.4137
8	28.0886	-81.3966
9	28.0583	-81.3894
10	28.1116	-81.4153

Table 29: Beetle identification results at DSNY

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
NEONTcarabid6125	*Carabidae* sp.		8/20/2012	1
NEONTcarabid6116	*Carabidae* sp.		7/23/2012	1
NEONTcarabid6115	*Selenophorus* sp.		7/23/2012	1
NEONTcarabid6123	*Carabidae* sp.		7/16/2012	2
NEONTcarabid6122	*Carabidae* sp.		7/30/2012	5
NEONTcarabid6109	*Selenophorus* sp.		7/30/2012	7
NEONTcarabid6121	*Amblygnathus iripennis*		7/16/2012	1
NEONTcarabid6088	*Anisodactylus* sp.	D3.A	8/20/2012	1
NEONTcarabid6090	*Anisodactylus* sp.	D3.A	7/23/2012	1
NEONTcarabid6093	*Anisodactylus haplomus*		7/16/2012	4
NEONTcarabid6142	*Anisodactylus haplomus*		7/23/2012	4
NEONTcarabid6091	*Anisodactylus haplomus*		7/16/2012	4
NEONTcarabid6143	*Anisodactylus haplomus*		7/23/2012	4
NEONTcarabid6092	*Anisodactylus haplomus*		7/16/2012	4

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
NEONTcarabid6141	*Anisodactylus haplomus*		7/16/2012	4
NEONTcarabid6089	*Anisodactylus haplomus*		7/23/2012	6
NEONTcarabid6144	*Anisodactylus haplomus*		8/13/2012	6
NEONTcarabid6151	*Cicindela punctulata*		8/6/2012	5
NEONTcarabid6110	*Clivina* sp.	D3.C	7/16/2012	3
NEONTcarabid6111	*Clivina* sp.	D3.B	7/16/2012	3
NEONTcarabid6112	*Clivina* sp.	D3.B	8/13/2012	3
NEONTcarabid6119	*Clivina* sp.	D3.B	7/16/2012	3
NEONTcarabid6113	*Clivina* sp.	D3.B	7/23/2012	3
7256	*Clivina* sp.		8/20/2012	1
7255	*Clivina* sp.		8/20/2012	1
7254	*Clivina* sp.		8/20/2012	1
7253	*Clivina* sp.		8/20/2012	1
7252	*Clivina* sp.		8/20/2012	1
7251	*Clivina* sp.		8/20/2012	1
7250	*Clivina* sp.		8/20/2012	1
7249	*Clivina* sp.		8/20/2012	1
7248	*Clivina* sp.		8/13/2012	1
7247	*Clivina* sp.		8/13/2012	1
7246	*Clivina* sp.		8/13/2012	1
7245	*Clivina* sp.		8/13/2012	1
7244	*Clivina* sp.		8/13/2012	1
7243	*Clivina* sp.		8/13/2012	1
7242	*Clivina* sp.		8/13/2012	1
7241	*Clivina* sp.		8/13/2012	1
7240	*Clivina* sp.		8/13/2012	1
7239	*Clivina* sp.		8/13/2012	1
7238	*Clivina* sp.		8/13/2012	1
7237	*Clivina* sp.		8/6/2012	1
7236	*Clivina* sp.		8/6/2012	1
7235	*Clivina* sp.		8/6/2012	1
7234	*Clivina* sp.		8/6/2012	1
7233	*Clivina* sp.		8/6/2012	1
7232	*Clivina* sp.		8/6/2012	1

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
7231	*Clivina* sp.		8/6/2012	1
7230	*Clivina* sp.		8/6/2012	1
7229	*Clivina* sp.		8/6/2012	1
7228	*Clivina* sp.		8/6/2012	1
7227	*Clivina* sp.		8/6/2012	1
7226	*Clivina* sp.		8/6/2012	1
7225	*Clivina* sp.		8/6/2012	1
7224	*Clivina* sp.		8/6/2012	1
7223	*Clivina* sp.		8/6/2012	1
7222	*Clivina* sp.		7/30/2012	1
7221	*Clivina* sp.		7/30/2012	1
7220	*Clivina* sp.		7/30/2012	1
7219	*Clivina* sp.		7/30/2012	1
7218	*Clivina* sp.		7/30/2012	1
7217	*Clivina* sp.		7/30/2012	1
7216	*Clivina* sp.		7/30/2012	1
7215	*Clivina* sp.		7/30/2012	1
7214	*Clivina* sp.		7/30/2012	1
7213	*Clivina* sp.		7/30/2012	1
7212	*Clivina* sp.		7/30/2012	1
7211	*Clivina* sp.		7/30/2012	1
7210	*Clivina* sp.		7/30/2012	1
7209	*Clivina* sp.		7/30/2012	1
7208	*Clivina* sp.		7/30/2012	7
7207	*Clivina* sp.		8/20/2012	1
7206	*Clivina* sp.		7/23/2012	1
7205	*Clivina* sp.		7/23/2012	1
7204	*Clivina* sp.		7/23/2012	1
7203	*Clivina* sp.		7/23/2012	1
7202	*Clivina* sp.		7/23/2012	1
7201	*Clivina* sp.		7/23/2012	1
7200	*Clivina* sp.		7/23/2012	1
7199	*Clivina* sp.		7/23/2012	1
7198	*Clivina* sp.		7/16/2012	1

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
7197	*Clivina* sp.		7/16/2012	1
7196	*Clivina* sp.		7/16/2012	1
7195	*Clivina* sp.		7/16/2012	1
7194	*Clivina* sp.		7/16/2012	1
7193	*Clivina* sp.		7/16/2012	1
7192	*Clivina* sp.		7/16/2012	1
NEONTcarabid6146	*Cyclotrachelus faber*		8/13/2012	3
NEONTcarabid6145	*Cyclotrachelus faber*		7/16/2012	3
NEONTcarabid6147	*Cyclotrachelus faber*		8/20/2012	5
NEONTcarabid6150	*Dicaelus elongatus*		7/16/2012	4
NEONTcarabid6120	*Elaphropus* sp.	D3.F	7/23/2012	2
NEONTcarabid6148	*Pasimachus strenuus*		8/6/2012	8
NEONTcarabid6149	*Pasimachus strenuus*		8/13/2012	8
NEONTcarabid6073	*Pasimachus sublaevis*		7/16/2012	1
NEONTcarabid6072	*Pasimachus sublaevis*		8/6/2012	2
NEONTcarabid6074	*Pasimachus sublaevis*		7/16/2012	2
NEONTcarabid6068	*Pasimachus sublaevis*		7/16/2012	6
NEONTcarabid6070	*Pasimachus sublaevis*		8/13/2012	6
NEONTcarabid6075	*Pasimachus sublaevis*		7/16/2012	6
NEONTcarabid6077	*Pasimachus sublaevis*		8/20/2012	7
NEONTcarabid6071	*Pasimachus sublaevis*		8/13/2012	8
NEONTcarabid6076	*Pasimachus sublaevis*		7/16/2012	8
NEONTcarabid6069	*Pasimachus sublaevis*		8/13/2012	8
7142	*Pasimachus sublaevis*		7/30/2012	7
7141	*Pasimachus sublaevis*		7/16/2012	1
7140	*Pasimachus sublaevis*		7/16/2012	1
7139	*Pasimachus sublaevis*		7/16/2012	6
7138	*Pasimachus sublaevis*		7/23/2012	9
7137	*Pasimachus sublaevis*		7/30/2012	9
7136	*Pasimachus sublaevis*		7/30/2012	1
7135	*Pasimachus sublaevis*		7/30/2012	1
7134	*Pasimachus sublaevis*		7/30/2012	1
7133	*Pasimachus sublaevis*		8/6/2012	7
7132	*Pasimachus sublaevis*		8/20/2012	1

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
7131	*Pasimachus sublaevis*		7/30/2012	9
7130	*Pasimachus sublaevis*		7/30/2012	9
7129	*Pasimachus sublaevis*		8/20/2012	7
7128	*Pasimachus sublaevis*		7/16/2012	2
7127	*Pasimachus sublaevis*		8/20/2012	1
7126	*Pasimachus sublaevis*		7/23/2012	5
7125	*Pasimachus sublaevis*		8/6/2012	7
7124	*Pasimachus sublaevis*		8/20/2012	7
7123	*Pasimachus sublaevis*		8/6/2012	10
7122	*Pasimachus sublaevis*		8/13/2012	9
7121	*Pasimachus sublaevis*		8/6/2012	9
7120	*Pasimachus sublaevis*		7/23/2012	8
7119	*Pasimachus sublaevis*		8/6/2012	6
7118	*Pasimachus sublaevis*		8/6/2012	7
7117	*Pasimachus sublaevis*		8/6/2012	7
7116	*Pasimachus sublaevis*		8/6/2012	2
7115	*Pasimachus sublaevis*		8/20/2012	5
7114	*Pasimachus sublaevis*		8/6/2012	7
7113	*Pasimachus sublaevis*		8/13/2012	5
7112	*Pasimachus sublaevis*		8/13/2012	5
7111	*Pasimachus sublaevis*		7/23/2012	9
7110	*Pasimachus sublaevis*		8/6/2012	1
7109	*Pasimachus sublaevis*		8/6/2012	5
7108	*Pasimachus sublaevis*		8/6/2012	1
7107	*Pasimachus sublaevis*		7/30/2012	9
7106	*Pasimachus sublaevis*		7/16/2012	7
7105	*Pasimachus sublaevis*		7/23/2012	5
7104	*Pasimachus sublaevis*		7/30/2012	9
7103	*Pasimachus sublaevis*		7/30/2012	9
7102	*Pasimachus sublaevis*		8/6/2012	1
7101	*Pasimachus sublaevis*		8/6/2012	1
7100	*Pasimachus sublaevis*		8/6/2012	5
7099	*Pasimachus sublaevis*		8/6/2012	7
7098	*Pasimachus sublaevis*		7/16/2012	9

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
7097	*Pasimachus sublaevis*		8/6/2012	7
7096	*Pasimachus sublaevis*		7/30/2012	7
7095	*Pasimachus sublaevis*		8/6/2012	9
7094	*Pasimachus sublaevis*		8/13/2012	9
7047	*Pasimachus sublaevis*		8/20/2012	9
7046	*Pasimachus sublaevis*		7/30/2012	5
7045	*Pasimachus sublaevis*		7/23/2012	1
7044	*Pasimachus sublaevis*		7/23/2012	8
7043	*Pasimachus sublaevis*		7/16/2012	5
7042	*Pasimachus sublaevis*		7/30/2012	9
7041	*Pasimachus sublaevis*		7/23/2012	9
7040	*Pasimachus sublaevis*		8/6/2012	1
7039	*Pasimachus sublaevis*		8/13/2012	7
7038	*Pasimachus sublaevis*		8/6/2012	7
7037	*Pasimachus sublaevis*		7/16/2012	7
7036	*Pasimachus sublaevis*		7/30/2012	9
7035	*Pasimachus sublaevis*		7/30/2012	9
7034	*Pasimachus sublaevis*		8/20/2012	5
7033	*Pasimachus sublaevis*		8/20/2012	1
7032	*Pasimachus sublaevis*		8/6/2012	8
7031	*Pasimachus sublaevis*		8/6/2012	9
7030	*Pasimachus sublaevis*		7/16/2012	1
7029	*Pasimachus sublaevis*		7/23/2012	1
7028	*Pasimachus sublaevis*		7/30/2012	1
7027	*Pasimachus sublaevis*		7/23/2012	9
7026	*Pasimachus sublaevis*		7/16/2012	8
7025	*Pasimachus sublaevis*		7/16/2012	7
7024	*Pasimachus sublaevis*		7/30/2012	9
7023	*Pasimachus sublaevis*		7/23/2012	5
7022	*Pasimachus sublaevis*		7/30/2012	9
7021	*Pasimachus sublaevis*		7/30/2012	5
7020	*Pasimachus sublaevis*		7/23/2012	2
7019	*Pasimachus sublaevis*		7/16/2012	9
7018	*Pasimachus sublaevis*		7/16/2012	3

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
7017	*Pasimachus sublaevis*		8/6/2012	9
7016	*Pasimachus sublaevis*		8/6/2012	9
7015	*Pasimachus sublaevis*		7/23/2012	7
7014	*Pasimachus sublaevis*		7/30/2012	7
7013	*Pasimachus sublaevis*		7/16/2012	7
7012	*Pasimachus sublaevis*		7/16/2012	7
7011	*Pasimachus sublaevis*		8/13/2012	9
7010	*Pasimachus sublaevis*		8/13/2012	9
7009	*Pasimachus sublaevis*		8/20/2012	6
7008	*Pasimachus sublaevis*		8/6/2012	7
7007	*Pasimachus sublaevis*		8/20/2012	7
7006	*Pasimachus sublaevis*		8/13/2012	7
7005	*Pasimachus sublaevis*		8/13/2012	7
NEONTcarabid6085	*Scarites ocalensis*		8/6/2012	2
NEONTcarabid6078	*Scarites ocalensis*		7/23/2012	2
NEONTcarabid6079	*Scarites ocalensis*		7/16/2012	6
NEONTcarabid6080	*Scarites ocalensis*		8/13/2012	6
NEONTcarabid6083	*Scarites ocalensis*		8/13/2012	7
NEONTcarabid6086	*Scarites ocalensis*		8/6/2012	7
NEONTcarabid6087	*Scarites ocalensis*		8/20/2012	7
NEONTcarabid6084	*Scarites ocalensis*		7/30/2012	7
NEONTcarabid6082	*Scarites ocalensis*		8/20/2012	7
NEONTcarabid6081	*Scarites ocalensis*		8/6/2012	7
7176	*Scarites subterraneus*		8/13/2012	6
7175	*Scarites subterraneus*		8/13/2012	6
7174	*Scarites subterraneus*		7/30/2012	6
7173	*Scarites subterraneus*		8/20/2012	2
7172	*Scarites subterraneus*		8/13/2012	2
7171	*Scarites subterraneus*		7/23/2012	6
7170	*Scarites subterraneus*		7/23/2012	7
7169	*Scarites subterraneus*		8/20/2012	7
7168	*Scarites subterraneus*		7/16/2012	7
7167	*Scarites subterraneus*		7/23/2012	10
7166	*Scarites subterraneus*		8/13/2012	7

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
7165	*Scarites subterraneus*		7/23/2012	2
7164	*Scarites subterraneus*		7/16/2012	7
7163	*Scarites subterraneus*		7/16/2012	7
NEONTcarabid6108	*Selenophorus ellipticus*		8/20/2012	1
NEONTcarabid6105	*Selenophorus ellipticus*		7/30/2012	1
NEONTcarabid6114	*Selenophorus ellipticus*		8/20/2012	1
NEONTcarabid6106	*Selenophorus ellipticus*		7/16/2012	4
NEONTcarabid6107	*Selenophorus ellipticus*		8/13/2012	4
NEONTcarabid6104	*Selenophorus ellipticus*		7/30/2012	7
NEONTcarabid6128	*Selenophorus fossulatus*		8/20/2012	1
NEONTcarabid6129	*Selenophorus fossulatus*		8/20/2012	1
NEONTcarabid6134	*Selenophorus fossulatus*		7/23/2012	1
NEONTcarabid6127	*Selenophorus fossulatus*		7/30/2012	1
NEONTcarabid6126	*Selenophorus fossulatus*		7/23/2012	1
NEONTcarabid6133	*Selenophorus fossulatus*		7/23/2012	1
NEONTcarabid6130	*Selenophorus fossulatus*		7/16/2012	1
NEONTcarabid6132	*Selenophorus fossulatus*		7/16/2012	1
NEONTcarabid6131	*Selenophorus fossulatus*		7/16/2012	1
NEONTcarabid6124	*Selenophorus fossulatus*		7/30/2012	1
NEONTcarabid6118	*Semiardistomis puncticollis*		7/30/2012	4
NEONTcarabid6117	*Semiardistomis puncticollis*		7/23/2012	4
NEONTcarabid6044	*Tetragonoderus intersectus*		7/23/2012	1
NEONTcarabid6042	*Tetragonoderus intersectus*		8/6/2012	1
NEONTcarabid6096	*Tetragonoderus intersectus*		7/23/2012	1
NEONTcarabid6040	*Tetragonoderus intersectus*		8/20/2012	1
NEONTcarabid6045	*Tetragonoderus intersectus*		7/23/2012	1
NEONTcarabid6043	*Tetragonoderus intersectus*		8/6/2012	1
NEONTcarabid6095	*Tetragonoderus intersectus*		7/23/2012	5
NEONTcarabid6041	*Tetragonoderus intersectus*		7/16/2012	5
NEONTcarabid6046	*Tetragonoderus intersectus*		7/23/2012	5
NEONTcarabid6094	*Tetragonoderus intersectus*		7/16/2012	5
NEONTcarabid6097	*Tetragonoderus laevigatus*		8/20/2012	1
NEONTcarabid6100	*Tetragonoderus laevigatus*		8/6/2012	1
NEONTcarabid6101	*Tetragonoderus laevigatus*		8/6/2012	1

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
NEONTcarabid6102	*Tetragonoderus laevigatus*		8/13/2012	1
NEONTcarabid6103	*Tetragonoderus laevigatus*		8/20/2012	1
NEONTcarabid6098	*Tetragonoderus laevigatus*		8/20/2012	1
NEONTcarabid6099	*Tetragonoderus laevigatus*		8/20/2012	1
7312	Unknown	D03.2012.MorphDC	8/20/2012	1
7311	Unknown	D03.2012.MorphDC	8/20/2012	1
7310	Unknown	D03.2012.MorphDC	8/20/2012	1
7309	Unknown	D03.2012.MorphDC	8/13/2012	1
7308	Unknown	D03.2012.MorphDC	8/13/2012	1
7307	Unknown	D03.2012.MorphDC	8/6/2012	1
7306	Unknown	D03.2012.MorphDC	8/6/2012	1
7305	Unknown	D03.2012.MorphDC	8/6/2012	1
7304	Unknown	D03.2012.MorphDC	7/30/2012	1
7303	Unknown	D03.2012.MorphDC	7/23/2012	4
7302	Unknown	D03.2012.MorphDC	7/23/2012	1
7185	Unknown	D03.2012.MorphDE	8/20/2012	4
7184	Unknown	D03.2012.MorphDE	8/13/2012	4
7183	Unknown	D03.2012.MorphDE	7/23/2012	4
7182	Unknown	D03.2012.MorphDE	8/6/2012	4
7181	Unknown	D03.2012.MorphDE	8/20/2012	4
7180	Unknown	D03.2012.MorphDE	8/6/2012	4
7179	Unknown	D03.2012.MorphDE	8/6/2012	4
7178	Unknown	D03.2012.MorphDE	7/30/2012	4
7177	Unknown	D03.2012.MorphDE	7/16/2012	4

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

5.6 Mosquitoes

5.6.1 Site-Specific Methods

Mosquito site characterization was conducted in June and July 2012 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. 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.

5.6.2 Results

Table 30: Mosquito trap locations at DSNY

Trap ID	Lat	Long
1	28.104	-81.43
2	28.044	-81.422
3	28.1	-81.414
4	28.047	-81.402

Note: Trap locations were recorded to only three decimal places, thus introducing mapping error. No sampling occurred outside of the permitted boundary.

Table 31: Mosquito identification results at DSNY

BOLD Sample ID	Scientific Name	Collection Date	Trap Location
NEONTculicid6225	*Aedes canadensis*	8/23/2012	1
NEONTculicid6294	*Psorophora ferox*	8/2/2012	1
NEONTculicid6569	*Aedes sollicitans*	7/11/2012	1
NEONTculicid6288	*Culex erraticus*	8/23/2012	2
NEONTculicid6292	*Psorophora columbiae*	8/23/2012	2
NEONTculicid6568	*Aedes taeniorhynchus*	7/11/2012	2
NEONTculicid6231	*Culex salinarius*	8/23/2012	2
NEONTculicid6291	*Psorophora columbiae*	8/23/2012	2
NEONTculicid6233	*Culex salinarius*	8/23/2012	2
NEONTculicid6284	*Anopheles quadrimaculatus*	8/23/2012	2
NEONTculicid6230	*Culex salinarius*	8/23/2012	2
NEONTculicid6285	*Culex nigripalpus*	8/23/2012	2
NEONTculicid6226	*Psorophora ciliata*	8/23/2012	2
NEONTculicid6293	*Mansonia titillans*	8/23/2012	2
NEONTculicid6616	*Culex erraticus*	8/23/2012	2
NEONTculicid6227	*Aedes infirmatus*	8/23/2012	2
NEONTculicid6232	*Culex salinarius*	8/23/2012	2

BOLD Sample ID	Scientific Name	Collection Date	Trap Location
NEONTculicid6420	*Aedes taeniorhynchus*	7/11/2012	2
NEONTculicid6421	*Aedes taeniorhynchus*	7/11/2012	2
NEONTculicid6564	*Aedes taeniorhynchus*	7/11/2012	2
NEONTculicid6228	*Aedes infirmatus*	8/23/2012	2
NEONTculicid6566	*Aedes taeniorhynchus*	7/11/2012	2
NEONTculicid6565	*Aedes taeniorhynchus*	7/11/2012	2
NEONTculicid6290	*Mansonia dyari*	8/23/2012	2
NEONTculicid6286	*Coquillettidia perturbans*	8/23/2012	2
NEONTculicid6422	*Aedes taeniorhynchus*	7/11/2012	2
NEONTculicid6570	*Anopheles atropos*	7/11/2012	2
NEONTculicid6417	*Aedes taeniorhynchus*	7/11/2012	2
NEONTculicid6571	*Anopheles atropos*	7/12/2012	2
NEONTculicid6287	*Culex erraticus*	8/23/2012	2
NEONTculicid6418	*Aedes taeniorhynchus*	7/11/2012	2
NEONTculicid6282	*Anopheles crucians*	8/23/2012	2
NEONTculicid6419	*Aedes taeniorhynchus*	7/11/2012	2
NEONTculicid6289	*Culex erraticus*	8/23/2012	2
NEONTculicid6229	*Culex salinarius*	8/23/2012	2
NEONTculicid6224	*Aedes mitchellae*	8/23/2012	3
NEONTculicid6234	*Aedes vexans*	8/23/2012	3
NEONTculicid6223	*Aedes mitchellae*	8/23/2012	3
NEONTculicid6222	*Aedes mitchellae*	8/23/2012	3
NEONTculicid6220	*Aedes atlanticus*	8/23/2012	4
NEONTculicid6283	*Culiseta melanura*	8/23/2012	4
NEONTculicid6221	*Aedes atlanticus*	8/23/2012	4
NEONTculicid6219	*Aedes atlanticus*	8/23/2012	4
NEONTculicid6296	*Uranotaenia sapphirina*	8/23/2012	4
NEONTculicid6295	*Uranotaenia lowii*	8/1/2012	4

5.7 Ticks

5.7.1 Site-Specific Methods

Tick drags were conducted at DSNY in the spring and summer of 2012 to test protocol methods and calculate capture rates. No tick identification or pathogen testing was performed. For more information on this protocol and data product numbers see Appendix A.

5.7.2 Results

Table 32: Tick sampling results at DSNY

Vegetation Type	Number of Plots Sampled	Tick Abundance (Mean)	Tick Abundance (stDev)	Total Number of Ticks Collected	Max Number of Ticks Collected	Number of Plots With No Ticks	Total Area Sampled (m^2)
Evergreen open tree canopy	9	0.3	0.95	3	3	8	2700
Mixed evergreen/deciduous open tree canopy	1	0	0	0	NA	1	300
Perennial graminoid grassland	7	0	0	0	NA	7	2100
Total	17	0.2	0.7	3	3	16	5100

Note: Vegetation types here match LANDFIRE (Landscape Fire and Resource Management Planning Tools; http://www.landfire.gov/) vegetation categories, rather than NLCD land cover types employed in current protocols.

5.8 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[06], RD[07]).

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.

Farmer, Anna L., et al. 2014. “Survey of Winter-breeding Amphibian Species.” Florida Fish and Wildlife Conservation Commisiion, Fish and Wildlife Research Institute.

Hammer, Roger L. Central Florida Wildflowers: A Field Guide to Wildflowers of the Lake Wales Ridge, Ocala National Forest, Disney Wilderness Preserve, and More than 60 State Parks and Preserves. Rowman & Littlefield, 2016.

Ware, S., C. Frost, and P.D. Doerr. 1993. Southern Mixed Hardwood Forest: The Former Longleaf Pine Forest, Pages 447-493 in (W.H. Martin, et al. eds.) Biodiversity of the Southeastern United States, John Wiley & Sons, New York. 502pp.

6 RELOCATABLE SITE 2- JONES ECOLOGICAL RESEARCH CENTER (JERC)

The Joseph Jones Ecological Research Center (JERC) is a 29000 (117 km^2) reserve located within the Lower Coastal Plains and Flatwoods areas in southern Georgia. JERC has a long history in research, conservation, and education of longleaf pine and aquatic ecosystems.

Figure 13: Phenocamera image for JERC. The phenocamera is located at the top of the NEON tower and faces north. Phenocamera images are available at https://phenocam.sr.unh.edu/webcam/network/table/.

Key Characteristics:

- Site host: Private Owner
- Located in: Baker County, Georgia
- Sampling Area: 13 km^2
- Plot Elevation: 30-60m
- Dominant vegetation type- The dominant vegetation cover at JERC is a mix of Longleaf Pine (*Pinus palustris* Mill.), oaks (various) and wiregrass (*Aristida stricta* Michx.).
- General management: Established as a quail hunting reserve in the 1920s, the Joseph Jones Ecological Research Center has conserved an extensive tract of longleaf pine and wiregrass community. Key research areas include; forest ecology, forest restoration, fire dynamics, and water resources. For the past 75 years

the Jones site has been managed with low intensity, dormant-season prescribed fires at a frequency of every 3-4 years (Mission, Values, and Programs, 2017).

- 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 JERC according to a spatially balanced and stratified-random design (RD[3]). The 2006 National Land Cover Database was selected for stratification because of the consistent and comparable data availability across the United States. Due to a misclassification between a stratum described by the NLCD (pasture hay) and existing ground cover (cultivated crops), all vegetation associated with agricultural was considered "cultivated crops". Similarly, due to a misclassification between a stratum described by the NLCD (grassland herbaceous) and existing ground cover (open mixed forest), TOS plots were not initially allocated to grassland herbaceous. The associated pixels will be reclassified with data from NEON's remote sensing platform such that a slight reallocation of effort will sample this landscape component early in NEON Operations. TOS Tower Plots were allocated according to a spatially balanced design in and around the NEON tower airshed (RD[03]). 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.

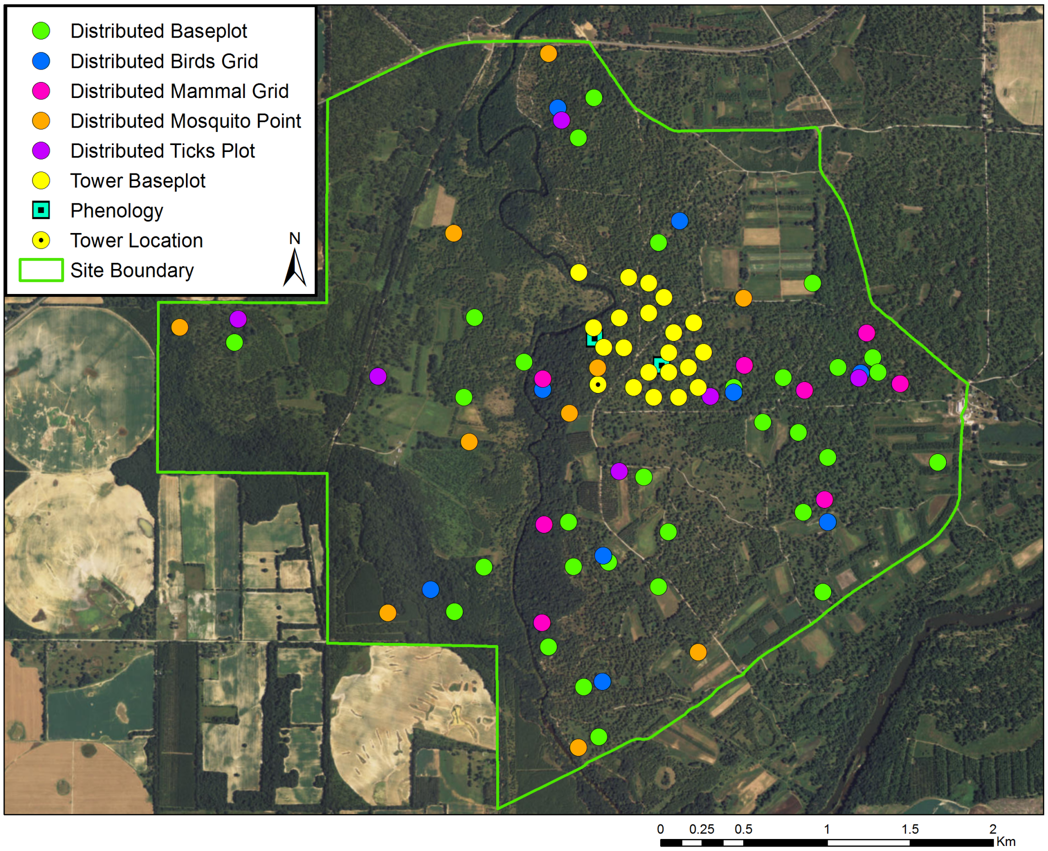

Figure 14: Map of TOS plot centroids within the NEON TOS sampling boundary at JERC

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

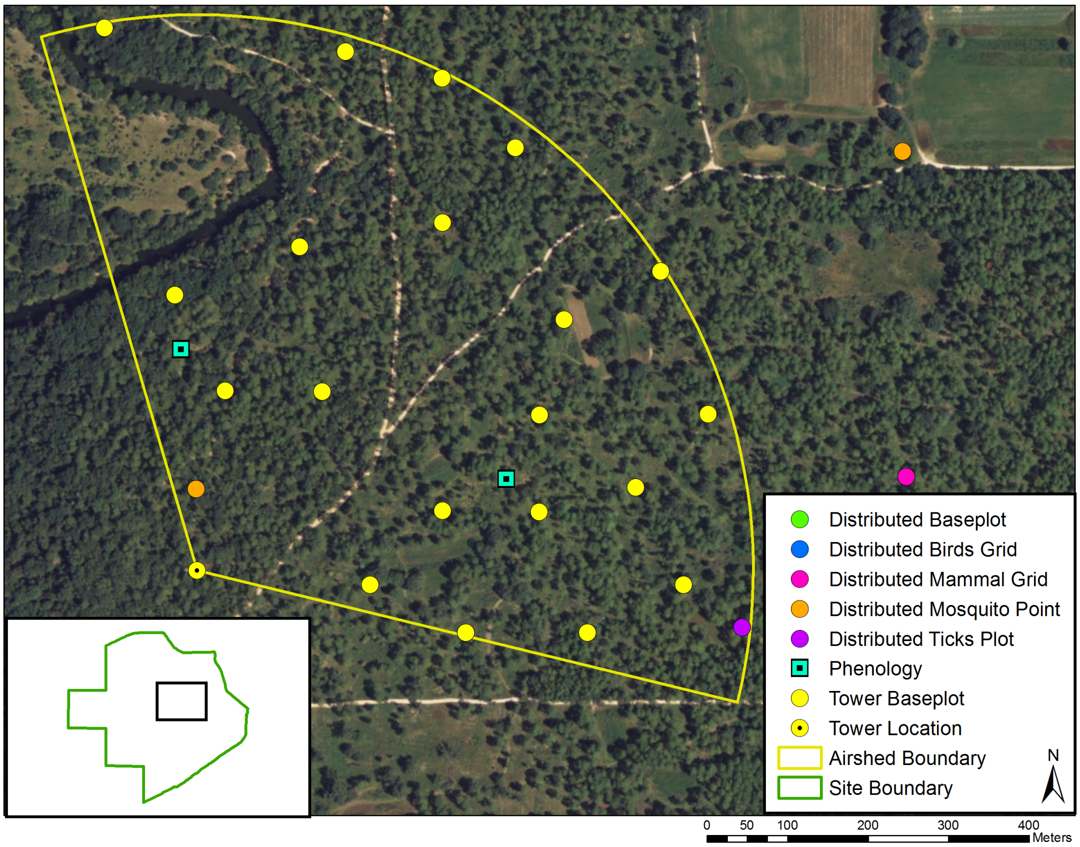

Figure 15: Map of the tower airshed at and TOS centroids JERC

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

Table 33: NLCD land cover classes and area within the TOS site boundary at JERC

NLCD Class	Site Area (km^2)	Percent (%)
Evergreen Forest	3.61	27.16
Deciduous Forest	3.06	23.04
Mixed Forest	1.57	11.77
Cultivated Crops	1.52	11.43
Pasture Hay	1.01	7.62
Grassland Herbaceous	0.97	7.32
Woody Wetlands	0.6	4.51
Developed Open Space	0.47	3.5
Shrub Scrub	0.46	3.48
Developed Low Intensity	0.01	0.1
Emergent Herbaceous Wetlands	0.01	0.07

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 34: NLCD land cover classes and TOS plot numbers at JERC

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Base Plot	Cultivated Crops	5
Distributed	Base Plot	Deciduous Forest	10
Distributed	Base Plot	Evergreen Forest	10
Distributed	Base Plot	Grassland Herbaceous	0
Distributed	Base Plot	Mixed Forest	5
Distributed	Base Plot	Pasture Hay	0
Distributed	Bird Grid	Cultivated Crops	0
Distributed	Bird Grid	Deciduous Forest	2
Distributed	Bird Grid	Evergreen Forest	4
Distributed	Bird Grid	Grassland Herbaceous	0
Distributed	Bird Grid	Mixed Forest	3
Distributed	Bird Grid	Pasture Hay	0
Distributed	Mammal Grid	Cultivated Crops	0
Distributed	Mammal Grid	Deciduous Forest	3
Distributed	Mammal Grid	Evergreen Forest	3
Distributed	Mammal Grid	Grassland Herbaceous	0

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Mammal Grid	Mixed Forest	2
Distributed	Mammal Grid	Pasture Hay	0
Distributed	Mosquito Point	Cultivated Crops	0
Distributed	Mosquito Point	Deciduous Forest	3
Distributed	Mosquito Point	Evergreen Forest	4
Distributed	Mosquito Point	Grassland Herbaceous	0
Distributed	Mosquito Point	Mixed Forest	3
Distributed	Mosquito Point	Pasture Hay	0
Distributed	Tick Plot	Cultivated Crops	1
Distributed	Tick Plot	Deciduous Forest	2
Distributed	Tick Plot	Evergreen Forest	2
Distributed	Tick Plot	Grassland Herbaceous	0
Distributed	Tick Plot	Mixed Forest	1
Distributed	Tick Plot	Pasture Hay	0
Tower	Base Plot	N/A	20
tower	Phenology Plot	N/A	2

Note:NLCD land cover classes are not used to stratify Tower Plots which are located in and around the NEON tower airshed. The dominant NLCD land cover type within the airshed is evergreen forest. Mammals and birds are only sampled in forested areas in JERC due to the small patch size of the other land cover types. Due to logistical constraints beetle sampling does not occur in cultivated crops.

Table 35: Number of Distributed Base plots per NLCD land cover class per protocol at JERC

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	Cultivated Crops	Canopy Foliage Chemistry	1
Distributed	Base Plot	Deciduous Forest	Canopy Foliage Chemistry	3
Distributed	Base Plot	Evergreen Forest	Canopy Foliage Chemistry	4
Distributed	Base Plot	Mixed Forest	Canopy Foliage Chemistry	2
Distributed	Base Plot	Cultivated Crops	Coarse Downed Wood	3
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	3

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Cultivated Crops	Digital Hemispherical Photos for Leaf Area Index	3
Distributed	Base Plot	Deciduous Forest	Digital Hemispherical Photos for Leaf Area Index	7
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	3
Distributed	Base Plot	Cultivated Crops	Herbaceous Biomass	3
Distributed	Base Plot	Deciduous Forest	Herbaceous Biomass	7
Distributed	Base Plot	Evergreen Forest	Herbaceous Biomass	7
Distributed	Base Plot	Mixed Forest	Herbaceous Biomass	3
Distributed	Base Plot	Cultivated Crops	Plant Diversity	5
Distributed	Base Plot	Deciduous Forest	Plant Diversity	10
Distributed	Base Plot	Evergreen Forest	Plant Diversity	10
Distributed	Base Plot	Mixed Forest	Plant Diversity	5
Distributed	Base Plot	Cultivated Crops	Soil Biogeochemistry	1
Distributed	Base Plot	Deciduous Forest	Soil Biogeochemistry	2
Distributed	Base Plot	Evergreen Forest	Soil Biogeochemistry	2
Distributed	Base Plot	Mixed Forest	Soil Biogeochemistry	1
Distributed	Base Plot	Cultivated Crops	Soil Microbes	1
Distributed	Base Plot	Deciduous Forest	Soil Microbes	2
Distributed	Base Plot	Evergreen Forest	Soil Microbes	2
Distributed	Base Plot	Mixed Forest	Soil Microbes	1
Distributed	Base Plot	Cultivated Crops	Vegetation Structure	3
Distributed	Base Plot	Deciduous Forest	Vegetation Structure	7
Distributed	Base Plot	Evergreen Forest	Vegetation Structure	7
Distributed	Base Plot	Mixed Forest	Vegetation Structure	3

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 36: Number of Tower Plots per protocol at JERC

Plot Type	Plot Subtype	Protocols	Number of Plots
Tower	Base Plot	Canopy Foliage Chemistry	4

Plot Type	Plot Subtype	Protocols	Number of Plots
Tower	Base Plot	Coarse Downed Wood	20
Tower	Base Plot	Digital Hemispherical Photos for Leaf Area Index	3
Tower	Base Plot	Herbaceous Biomass	20
Tower	Base Plot	Litterfall and Fine Woody Debris	20
Tower	Base Plot	Plant Belowground Biomass	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 Sampling Season Characterization: JERC

For numerous TOS protocols, the length of the sampling season, the number of bouts, and when those bouts occur is dictated by the seasonal status of the plant community. By monitoring 'greenness' on a 16 day interval, the MODIS/Terra EVI phenology product provides consistent, reliable insight into plant community phenology and intensity at the continental scale. For those protocols for which timing is standardized by greenness transitions and/or peak green status, NEON has utilized these data as the primary means of guiding temporal aspects of TOS sampling at each site.

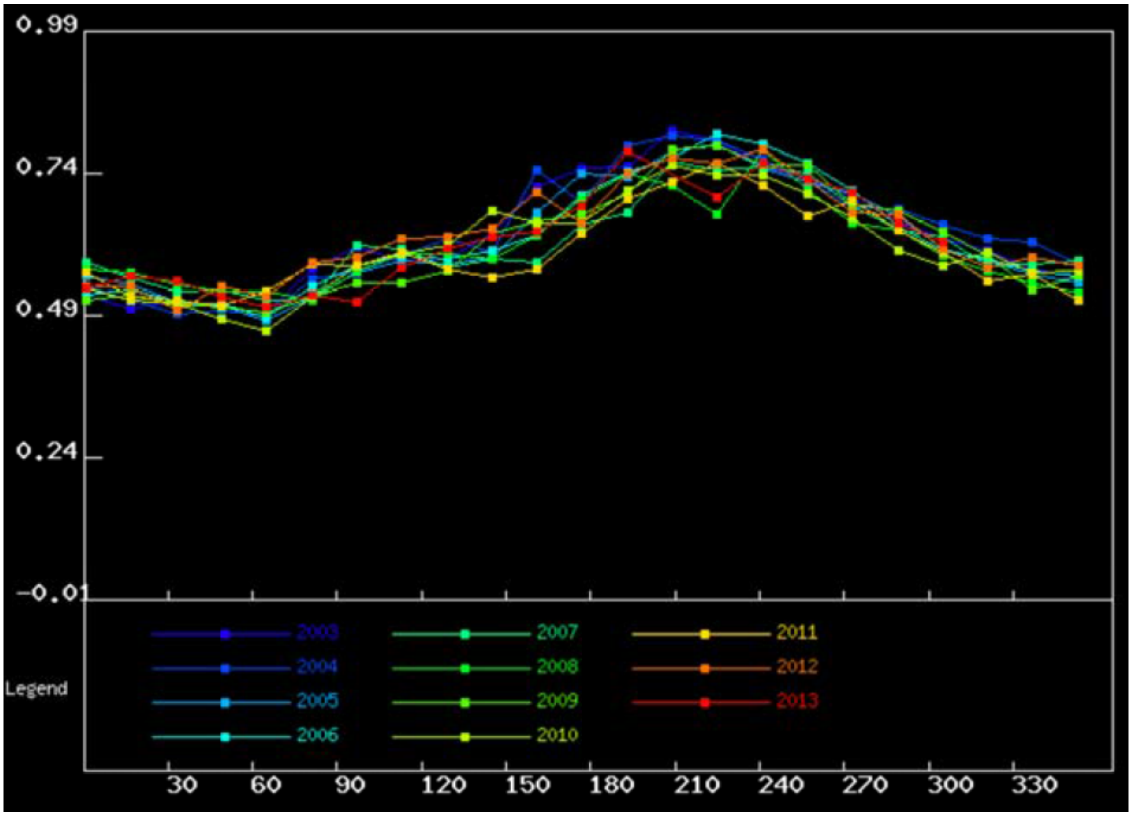

Figure 16: MODIS-EVI greenness (y-axis = EVI ratio) as a function of time (x-axis = DOY) for the years 2003-2013 at the NEON JERC site.

Table 37: Average MODIS-EVI greenness dates for the NEON JERC site, based on data from 2003-2013 (DOY, with MM/DD in parentheses).

Average Increase	Average Maximum	Average Decrease	Average Minimum
90 (04/01)	175 (06/25)	220 (08/09)	310 (11/07)

MODIS Product Details

- Product: MODIS-EVI phenology product, 16 day interval, 250 m grid, data included from all pixels with acceptable quality within user-defined square that roughly overlaps the TOS site boundary.
- Date range: 2003-2013
- User selected area: 10.25 km x 10.25 km box, Centroid Latitude: 31.19484, Longitude: -84.46861 (WGS84 datum)

6.3 Belowground Biomass

6.3.1 Site-Specific Methods

Belowground biomass characterization data were collected down down to a depth of 180 cm by NEON staff in December 2012. 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[8]) for more information. Samples were collected following the standard methods outlined in TOS Site Characterization Methods (RD[6]). A bulk density soil corer and soil knife were used to extract soil to test out protocols methods. Roots were sorted by diameter size (less than or greater than two mm) and 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.

6.3.2 Results

Table 38: Soil Pit Information at JERC.

Latitude	Longitude	Soil Family	Soil Order
31.19608	-84.46647	Loamy - kaolinitic - thermic Arenic Kandiudults	Ultisol

Soil Profile was described by Natural Resource Conservation Service (NRCS).

Table 39: Fine root mass per depth increment (cm) at JERC

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
0	10	1.22	0.42
10	20	0.67	0.46
20	30	0.51	0.37
30	40	0.38	0.2
40	50	0.25	0.08
50	60	0.39	0.27
60	70	1.14	0.56
70	80	0.06	0.02
80	90	0.32	0.42
90	100	0.19	0.17
100	120	0.28	0.08
120	140	0.22	0.18

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
140	160	0.5	0.18
160	180	0.18	0.1

Table 40: Cumulative fine root mass as a function of depth (cm) at JERC

Upper Depth	Lower Depth	Mean Cumulative (g per m^2)	Cumulative Std Dev
0	10	122.37	41.73
10	20	189.87	62.55
20	30	240.55	98.62
30	40	278.65	113.88
40	50	303.37	116.53
50	60	342.32	113.94
60	70	456.33	73.82
70	80	462.58	71.53
80	90	494.24	113.9
90	100	513.66	130.94
100	120	568.97	114.58
120	140	612.79	150.5
140	160	712.17	186.01
160	180	747.33	189.38

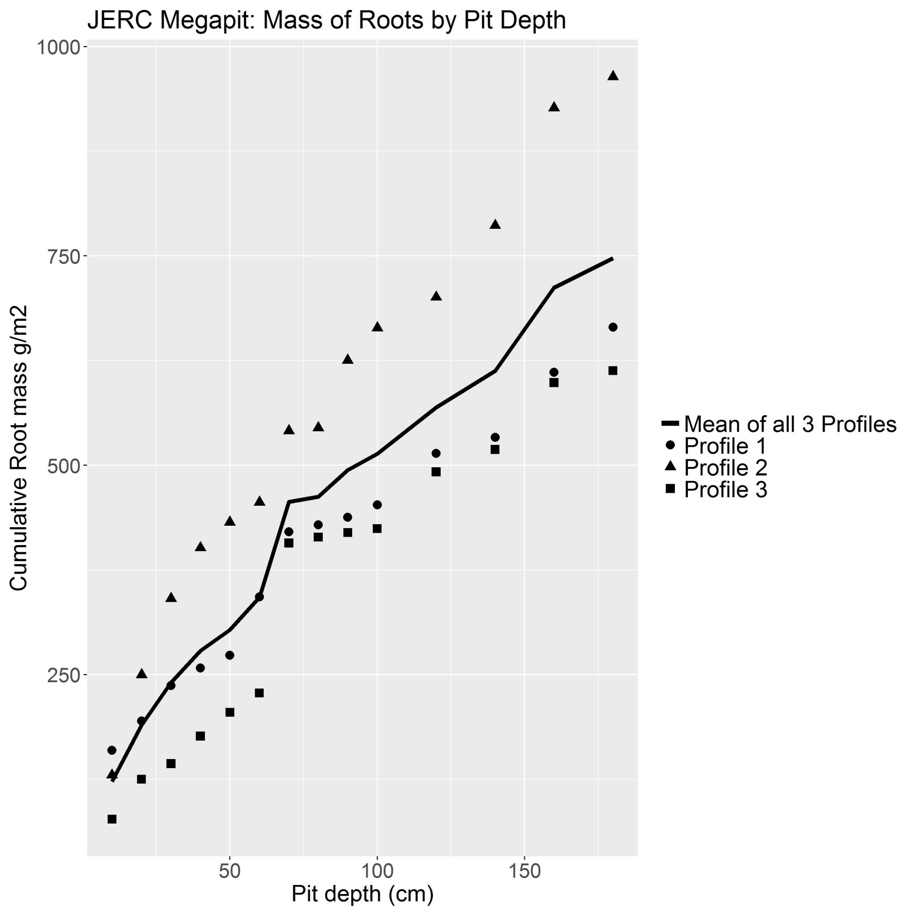

Figure 17: Cumulative root mass by pit depth at JERC

Table 41: Fine root biomass sampling summary data at JERC

Total Pit Depth (cm)	180
Total Mean Cumulative Mass at 30cm (g per m^2)	240.55
Total Mean Cumulative Mass at 100cm (g per m^2)	513.66
Total Mean Cumulative Mass (g per m^2)	747.33

6.4 Plant Characterization and Phenology Species Selection

6.4.1 Site-Specific Methods

Plant characterization data were collected by an external contractor during the summer of July 2013. Plant characterization data informs sampling procedures for plant phenology and plant productivity protocols.

The overall ranking ("Rank" in the table below) was calculated based on three separate measurements. Overall ranking weights are influenced by the number of species within each grouping.

1. Mean percent cover values were calculated based on species specific cover estimation for all plant species under 3m tall in eight 1m by 1m subplots per plot; see the TOS Protocol and Procedure: Plant Diversity Sampling (RD[09]) for more information.
2. Mean canopy area values were calculated based on all species specific shrub canopy diameter measurements within the entire plot or subplot; see the TOS Protocol and Procedure: Measurement of Vegetation Structure (RD[10]) for more information.
3. Mean ABH (area at breast height) measurements were calculated based on diameter at breast height measurements for all woody vegetation with a diameter greater than 1cm at 130cm height within the entire plot or subplot; see the TOS Protocol and Procedure: Measurement of Vegetation Structure (RD[10]) for more information.

The standard field methods and ranking calculations are further outlined in TOS Site Characterization Methods (RD[6]). For more information on this protocol and data product numbers see Appendix A.

6.4.2 Results

Table 42: Site plant characterization and phenology species summary at JERC

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
ARBE7	*Aristida beyrichiana* Trin. & Rupr.	1	16	NA	NA
RHCO	*Rhus copallinum* L.	10	2	NA	NA
STSY	*Stillingia sylvatica* L.	100	<1	NA	NA
AGAR4	*Ageratina aromatica* (L.) Spach	101	<1	NA	NA
DICO2	*Dichanthelium commutatum* (Schult.) Gould	101	<1	NA	NA
STHU2	*Stylisma humistrata* (Walter) Chapm.	101	<1	NA	NA
TIUS	*Tillandsia usneoides* (L.) L.	101	<1	NA	NA
VIAE	*Vitis aestivalis* Michx.	101	<1	NA	NA
ZOBR	*Zornia bracteata* Walter ex J.F. Gmel.	101	<1	NA	NA
LIST2	*Liquidambar styraciflua* L.	107	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
SERE2	*Serenoa repens* (W. Bartram) Small	108	<1	NA	NA
BICA	*Bignonia capreolata* L.	109	<1	NA	NA
LESE7	*Lechea sessiliflora* Raf.	109	<1	NA	NA
MUCA2	*Muhlenbergia capillaris* (Lam.) Trin.	109	<1	NA	NA
PAQU2	*Parthenocissus quinquefolia* (L.) Planch.	109	<1	NA	NA
TOPU2	*Toxicodendron pubescens* Mill.	11	2	NA	NA
COFL2	*Cornus florida* L.	113	<1	NA	NA
PRSE2	*Prunus serotina* Ehrh.	114	<1	NA	NA
AMAR2	*Ambrosia artemisiifolia* L.	115	<1	NA	NA
DEOB5	*Desmodium obtusum* (Muhl. ex Willd.) DC.	115	<1	NA	NA
ERSP	*Eragrostis spectabilis* (Pursh) Steud.	115	<1	NA	NA
LIGR9	*Liatris gracilis* Pursh	115	<1	NA	NA
RHTO3	*Rhynchosia tomentosa* (L.) Hook. & Arn.	115	<1	NA	NA
TRDI2	*Trichostema dichotomum* L.	115	<1	NA	NA
RUCU	*Rubus cuneifolius* Pursh	12	1	NA	NA
BIBI7	*Bidens bipinnata* L.	121	<1	NA	NA
CRFL2	*Crataegus flava* Aiton	121	<1	NA	NA
LEVI7	*Lespedeza virginica* (L.) Britton	121	<1	NA	NA
MAVI5	*Manfreda virginica* (L.) Salisb. ex Rose	121	<1	NA	NA
PHHE5	*Physalis heterophylla* Nees	121	<1	NA	NA
QUPH	*Quercus phellos* L.	121	<1	NA	NA
RUCA4	*Ruellia caroliniensis* (J.F. Gmel.) Steud.	121	<1	NA	NA
RUHI2	*Rudbeckia hirta* L.	121	<1	NA	NA
SMRO	*Smilax rotundifolia* L.	121	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
STPA8	*Stylisma patens* (Desr.) Myint	121	<1	NA	NA
SAAL5	*Sassafras albidum* (Nutt.) Nees	13	1	NA	0.02
CELA	*Celtis laevigata* Willd.	131	<1	NA	NA
CAAM2	*Callicarpa americana* L.	132	<1	NA	NA
JUVI	*Juniperus virginiana* L.	133	<1	NA	NA
ARPU8	*Aristida purpurascens* Poir.	134	<1	NA	NA
CLEMA	*Clematis* sp.	134	<1	NA	NA
CNURS	*Cnidoscolus urens* (L.) Arthur var. *stimulosus* (Michx.) Govaerts	134	<1	NA	NA
COCA	*Cocculus carolinus* (L.) DC.	134	<1	NA	NA
EUFL3	*Eustachys floridana* Chapm.	134	<1	NA	NA
PABI3	*Paspalum bifidum* (Bertol.) Nash	134	<1	NA	NA
RHDI2	*Rhynchosia difformis* (Elliott) DC.	134	<1	NA	NA
SACA15	*Sanicula canadensis* L.	134	<1	NA	NA
SECO4	*Setaria corrugata* (Elliott) Schult.	134	<1	NA	NA
SOAL6	*Solidago altissima* L.	134	<1	NA	NA
SOAR	*Solidago arguta* Aiton	134	<1	NA	NA
TEVI	*Tephrosia virginiana* (L.) Pers.	134	<1	NA	NA
TRUR	*Tragia urens* L.	134	<1	NA	NA
CEVI2	*Centrosema virginianum* (L.) Benth.	14	1	NA	NA
HYCR3	*Hypericum crux-andreae* (L.) Crantz	147	<1	NA	NA
ACRH	*Acalypha rhomboidea* Raf.	148	<1	NA	NA
BROV4	*Brunnichia ovata* (Walter) Shinners	148	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
CACO15	*Carya cordiformis* (Wangenh.) K. Koch	148	<1	NA	NA
CANI3	*Carex nigromarginata* Schwein.	148	<1	NA	NA
CRGL2	*Croton glandulosus* L.	148	<1	NA	NA
CYEC2	*Cyperus echinatus* (L.) Alph. Wood	148	<1	NA	NA
CYPL3	*Cyperus plukenetii* Fernald	148	<1	NA	NA
DAPI2	*Dalea pinnata* (J.F. Gmel.) Barneby	148	<1	NA	NA
DILA9	*Dichanthelium laxiflorum* (Lam.) Gould	148	<1	NA	NA
DIOL	*Dichanthelium oligosanthes* (Schult.) Gould	148	<1	NA	NA
DISP2	*Dichanthelium sphaerocarpon* (Elliott) Gould	148	<1	NA	NA
ELTO2	*Elephantopus tomentosus* L.	148	<1	NA	NA
EUGL7	*Eupatorium glaucescens* Elliott	148	<1	NA	NA
EUHY	*Eupatorium hyssopifolium* L.	148	<1	NA	NA
GYBR	*Gymnopogon brevifolius* Trin.	148	<1	NA	NA
HEAN2	*Helianthus angustifolius* L.	148	<1	NA	NA
LEAN	*Lespedeza angustifolia* (Pursh) Elliott	148	<1	NA	NA
LESPE	*Lespedeza* sp.	148	<1	NA	NA
LEVI2	*Leersia virginica* Willd.	148	<1	NA	NA
MATEL	*Matelea* sp.	148	<1	NA	NA
PENST	*Penstemon* sp.	148	<1	NA	NA
PSOB3	*Pseudognaphalium obtusifolium* (L.) Hilliard & B.L. Burtt	148	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
QUVI	*Quercus virginiana* Mill.	148	<1	NA	NA
RHMI10	*Rhynchosia michauxii* Vail	148	<1	NA	NA
RUTR	*Rubus trivialis* Michx.	148	<1	NA	NA
SCLER2	*Scleria* sp.	148	<1	NA	NA
SIAS2	*Silphium asteriscus* L.	148	<1	NA	NA
SILPH	*Silphium* sp.	148	<1	NA	NA
SMBO2	*Smilax bona-nox* L.	148	<1	NA	NA
SPGL2	*Spermacoce glabra* Michx.	148	<1	NA	NA
TEHI2	*Tephrosia hispidula* (Michx.) Pers.	148	<1	NA	NA
TRCA4	*Tridens carolinianus* (Steud.) Henr.	148	<1	NA	NA
TROH	*Tradescantia ohiensis* Raf.	148	<1	NA	NA
TRSE4	*Triumfetta semitriloba* Jacq.	148	<1	NA	NA
TRSE5	*Trichostema setaceum* Houtt.	148	<1	NA	NA
VIOLA	*Viola* sp.	148	<1	NA	NA
SONU2	*Sorghastrum nutans* (L.) Nash	15	<1	NA	NA
VAAR	*Vaccinium arboreum* Marshall	16	<1	NA	NA
CHLA5	*Chasmanthium latifolium* (Michx.) Yates	17	<1	NA	NA
VAMY3	*Vaccinium myrsinites* Lam.	18	<1	NA	NA
ILOP	*Ilex opaca* Aiton	184	<1	NA	NA
LIMI5	*Licania michauxii* Prance	19	<1	NA	NA
PIPA2	*Pinus palustris* Mill.	2	<1	NA	9.6
SCSC	*Schizachyrium scoparium* (Michx.) Nash	20	<1	NA	NA
TIAM	*Tilia americana* L.	21	<1	NA	0.03
QUST	*Quercus stellata* Wangenh.	22	<1	NA	NA
ANGE	*Andropogon gerardii* Vitman	23	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
DITE2	*Diodia teres* Walter	24	<1	NA	NA
SILA20	*Sideroxylon lanuginosum* Michx.	25	<1	NA	0.02
MIMI22	*Mimosa microphylla* Dryand.	26	<1	NA	NA
PIGR4	*Pityopsis graminifolia* (Michx.) Nutt.	27	<1	NA	NA
RHRE	*Rhynchosia reniformis* DC.	28	<1	NA	NA
TADI2	*Taxodium distichum* (L.) Rich.	29	NA	NA	0.37
QUFA	*Quercus falcata* Michx.	3	4	NA	NA
PIAS2	*Pityopsis aspera* (Shuttlw. ex Small) Small	30	<1	NA	NA
AMPS	*Ambrosia psilostachya* DC.	31	<1	NA	NA
COAS2	*Cornus asperifolia* Michx.	32	<1	NA	NA
CRRO5	*Crotalaria rotundifolia* Walter ex J.F. Gmel.	33	<1	NA	NA
SCTE5	*Schizachyrium tenerum* Nees	34	<1	NA	NA
ULAL	*Ulmus alata* Michx.	35	<1	NA	0.27
QUVE	*Quercus velutina* Lam.	36	<1	NA	NA
CETE	*Celtis tenuifolia* Nutt.	37	<1	NA	NA
QUNI	*Quercus nigra* L.	38	<1	NA	NA
DIVI5	*Diospyros virginiana* L.	39	<1	NA	NA
QUHE2	*Quercus hemisphaerica* W. Bartram ex Willd.	4	2	NA	0.79
IPHE	*Ipomoea hederacea* Jacq.	40	<1	NA	NA
IOLI2	*Ionactis linariifolius* (L.) Greene	41	<1	NA	NA
SOOD	*Solidago odora* Aiton	41	<1	NA	NA
DELI2	*Desmodium lineatum* DC.	43	<1	NA	NA
DIOV	*Dichanthelium ovale* (Elliott) Gould & C.A. Clark	43	<1	NA	NA
VEAN	*Vernonia angustifolia* Michx.	43	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
DEMA2	*Desmodium marilandicum* (L.) DC.	46	<1	NA	NA
EUPU7	*Euphorbia pubentissima* Michx.	47	<1	NA	NA
SYDU2	*Symphyotrichum dumosum* (L.) G.L. Nesom	47	<1	NA	NA
ASAN6	*Asimina angustifolia* Raf.	49	<1	NA	NA
QUIN	*Quercus incana* W. Bartram	5	3	NA	NA
CLMA4	*Clitoria mariana* L.	50	<1	NA	NA
SYCO3	*Symphyotrichum concolor* (L.) G.L. Nesom	50	<1	NA	NA
ELEL3	*Elephantopus elatus* Bertol.	52	<1	NA	NA
LERE2	*Lespedeza repens* (L.) W.P.C. Barton	53	<1	NA	NA
ANDRO2	*Andropogon* sp.	54	<1	NA	NA
STUM2	*Strophostyles umbellata* (Muhl. ex Willd.) Britton	54	<1	NA	NA
VAST	*Vaccinium stamineum* L.	54	<1	NA	NA
RUFL	*Rubus flagellaris* Willd.	57	<1	NA	NA
SMAU	*Smilax auriculata* Walter	58	<1	NA	NA
DEPA6	*Desmodium paniculatum* (L.) DC.	59	<1	NA	NA
GESE	*Gelsemium sempervirens* (L.) W.T. Aiton	59	<1	NA	NA
IPHE2	*Ipomoea hederifolia* L.	59	<1	NA	NA
CHNI2	*Chamaecrista nictitans* (L.) Moench	6	3	NA	NA
AEPA	*Aesculus pavia* L.	62	<1	NA	NA
SETO7	*Sericocarpus tortifolius* (Michx.) Nees	63	<1	NA	NA
GALAC	*Galactia* sp.	64	<1	NA	NA
CRATA	*Crataegus* sp.	65	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
PASE5	*Paspalum setaceum* Michx.	66	<1	NA	NA
STBI2	*Stylosanthes biflora* (L.) Britton, Sterns & Poggenb.	66	<1	NA	NA
CRAR2	*Croton argyranthemus* Michx.	68	<1	NA	NA
ACGR2	*Acalypha gracilens* A. Gray	69	<1	NA	NA
QUMA6	*Quercus margarettae* (Ashe) Small	7	2	NA	0.72
DEFL3	*Desmodium floridanum* Chapm.	70	<1	NA	NA
GAFI2	*Gaura filipes* Spach	70	<1	NA	NA
CAAL27	*Carya tomentosa* (Lam.) Nutt.	72	<1	NA	0.07
QULA2	*Quercus laevis* Walter	73	<1	NA	NA
VIRO3	*Vitis rotundifolia* Michx.	74	<1	NA	NA
GAPI2	*Galium pilosum* Aiton	75	<1	NA	NA
IPPA	*Ipomoea pandurata* (L.) G. Mey.	75	<1	NA	NA
ACBA3	*Acer barbatum* Michx.	77	<1	NA	0.04
EUAL2	*Eupatorium album* L.	78	<1	NA	NA
ILVO	*Ilex vomitoria* Aiton	79	<1	NA	NA
PTAQ	*Pteridium aquilinum* (L.) Kuhn	8	3	NA	NA
ULRU	*Ulmus rubra* Muhl.	80	NA	NA	0.06
DEST2	*Desmodium strictum* (Pursh) DC.	81	<1	NA	NA
SOTO2	*Solidago tortifolia* Elliott	81	<1	NA	NA
CAGL8	*Carya glabra* (Mill.) Sweet	83	<1	NA	NA
DIAC	*Dichanthelium aciculare* (Desv. ex Poir.) Gould & C.A. Clark	84	<1	NA	NA
DIVI7	*Dichanthelium villosissimum* (Nash) Freckmann	84	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area per m^2	Mean ABH (cm^2 per m^2)
CHGO	*Chrysopsis gossypina* (Michx.) Elliott	86	<1	NA	NA
DACA8	*Dalea carnea* (Michx.) Poir.	86	<1	NA	NA
DECI	*Desmodium ciliare* (Muhl. ex Willd.) DC.	86	<1	NA	NA
SAAL21	*Saccharum alopecuroides* (L.) Nutt.	86	<1	NA	NA
SEPA10	*Setaria parviflora* (Poir.) Kerguélen	86	<1	NA	NA
SMSM	*Smilax smallii* Morong	86	<1	NA	NA
TRUR2	*Tragia urticifolia* Michx.	86	<1	NA	NA
DYOB	*Dyschoriste oblongifolia* (Michx.) Kuntze	9	2	NA	NA
CECA4	*Cercis canadensis* L.	93	<1	NA	NA
DIFR6	*Ditrysinia fruticosa* (W. Bartram) Govaerts & Frodin	94	<1	NA	NA
CARA2	*Campsis radicans* (L.) Seem. ex Bureau	95	<1	NA	NA
HYHY	*Hypericum hypericoides* (L.) Crantz	95	<1	NA	NA
MAGO	*Matelea gonocarpos* (Walter) Shinners	95	<1	NA	NA
TORA2	*Toxicodendron radicans* (L.) Kuntze	95	<1	NA	NA
ASPA18	*Asimina parviflora* (Michx.) Dunal	99	<1	NA	NA

Note: Taxon IDs and scientific names are based on the USDA Plants database (plants.usda.gov). Plants identified as *Mimosa microphylla* are likely misidentified *M. quadrivalvis*. Plants identified as *Matelea genocarpos* are likely misidentified *Discorea floridana*.

Table 43: Per plot breakdown of species richness, diversity, and herbaceous cover at JERC

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover
JERC_047	33	3.07	96

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover
JERC_048	28	2.75	126
JERC_049	45	2.61	181
JERC_050	41	3.28	91
JERC_051	34	3.22	80
JERC_052	33	2.72	96
JERC_053	35	3.05	122
JERC_054	32	3.25	51
JERC_055	45	3.29	163
JERC_056	38	3.02	128
JERC_057	24	2.38	76
JERC_058	42	3.35	164
JERC_059	31	2.54	151
JERC_060	25	2.33	188
JERC_061	37	3.25	117
JERC_062	38	3.14	135
JERC_063	32	2.68	138
JERC_064	29	2.7	129
JERC_065	32	2.61	137
JERC_066	34	3.01	110

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

Bryophyte percent cover data were used to determine which sites qualify for implementation of the Bryophyte Productivity protocol. However, bryophyte productivity sampling was discontinued in 2018 and NEON no longer implements this protocol. No bryophyte cover was recorded in JERC Tower Base Plots.

6.5 Beetles

6.5.1 Site-Specific Methods

Beetle site characterization was conducted in June and July 2012 by NEON staff following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Beetle site characterization data were collected to start site level teaching collections. 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.

6.5.2 Results

Table 44: Beetle trap locations at JERC

Trap ID	Lat	Long
1	31.1827	-84.4781
2	31.1975	-84.4771
3	31.1982	-84.4742
4	31.2006	-84.4729
5	31.2068	-84.4567
6	31.1874	-84.4707
7	31.2061	-84.4746
8	31.1891	-84.461
9	31.2034	-84.4631

Table 45: Beetle identification results at JERC

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
NEONTcarabid6008	*Dicaelus dilatatus dilatatus*		7/20/2012	1
NEONTcarabid6009	*Dicaelus dilatatus dilatatus*		7/20/2012	1
NEONTcarabid6034	*Selenophorus opalinus*		8/24/2012	1
NEONTcarabid6016	*Selenophorus ellipticus*		7/27/2012	2
NEONTcarabid6030	*Anisodactylus*	D3.A	7/20/2012	2
NEONTcarabid6013	*Selenophorus ellipticus*		7/20/2012	2
NEONTcarabid6015	*Selenophorus ellipticus*		7/27/2012	2
NEONTcarabid6023	*Anisodactylus*	D3.A	7/27/2012	2
NEONTcarabid6026	*Anisodactylus*	D3.A	7/20/2012	2
NEONTcarabid6018	*Selenophorus ellipticus*		7/20/2012	2
NEONTcarabid6014	*Selenophorus ellipticus*		8/3/2012	2
NEONTcarabid6029	*Anisodactylus*	D3.A	8/3/2012	2
NEONTcarabid6038	*Tetragonoderus intersectus*		8/3/2012	2
NEONTcarabid6032	*Tetracha carolina*		8/10/2012	2
NEONTcarabid6012	*Anisodactylus*	D3.A	7/20/2012	2
NEONTcarabid6019	*Selenophorus ellipticus*		7/20/2012	2
NEONTcarabid6022	*Selenophorus ellipticus*		7/27/2012	2
NEONTcarabid6037	*Tetragonoderus intersectus*		8/24/2012	2

Sample ID	Scientific Name	Morpho Species Name	Collection Date	Trap Location
NEONTcarabid6020	*Selenophorus ellipticus*		7/20/2012	2
NEONTcarabid6024	*Anisodactylus*	D3.A	8/17/2012	2
NEONTcarabid6017	*Selenophorus ellipticus*		8/3/2012	2
NEONTcarabid6025	*Anisodactylus*	D3.A	8/24/2012	2
NEONTcarabid6006	*Pasimachus sublaevis*		7/20/2012	2
NEONTcarabid6021	*Selenophorus ellipticus*		7/27/2012	2
NEONTcarabid6027	*Anisodactylus*	D3.A	7/20/2012	2
NEONTcarabid6011	*Anisodactylus haplomus*		8/10/2012	2
NEONTcarabid6036	*Tetragonoderus intersectus*		8/10/2012	2
NEONTcarabid6028	*Anisodactylus haplomus*		8/17/2012	2
NEONTcarabid6007	*Pasimachus sublaevis*		7/27/2012	3
NEONTcarabid6001	*Pasimachus sublaevis*		8/17/2012	3
NEONTcarabid6003	*Pasimachus sublaevis*		8/10/2012	3
NEONTcarabid6004	*Pasimachus sublaevis*		8/10/2012	3
NEONTcarabid6005	*Pasimachus sublaevis*		8/24/2012	4
NEONTcarabid6002	*Pasimachus sublaevis*		7/27/2012	4
NEONTcarabid6000	*Pasimachus sublaevis*		8/10/2012	4
NEONTcarabid6035	*Apenes sinuatus*		7/20/2012	4
NEONTcarabid6033	*Tetracha carolina*		8/24/2012	5
NEONTcarabid6010	*Harpalus*	D3.D	8/17/2012	5
NEONTcarabid6039	*Tetragonoderus intersectus*		8/3/2012	5

6.6 Mosquitoes

6.6.1 Site-Specific Methods

Mosquito site characterization was conducted in June and July 2012 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. 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.

6.6.2 Results

Table 46: Mosquito trap locations at JERC

Trap ID	Lat	Long
1	31.186	-84.482
2	31.183	-84.478
3	31.201	-84.473
4	31.187	-84.471
5	31.203	-84.463
6	31.207	-84.457

Note: Trap locations were recorded to only three decimal places, thus introducing mapping error. No sampling occurred outside of the permitted boundary.

Table 47: Mosquito identification results at JERC

BOLD Sample ID	Scientific Name	Collection Date	Trap Location
NEONTculicid6201	*Aedes atlanticus*	7/18/2012	1
NEONTculicid6188	*Aedes albopictus*	8/29/2012	1
NEONTculicid6278	*Psorophora ferox*	7/18/2012	1
NEONTculicid6189	*Culex erraticus*	7/18/2012	1
NEONTculicid6203	*Aedes atlanticus*	7/18/2012	1
NEONTculicid6191	*Aedes albopictus*	8/9/2012	1
NEONTculicid6277	*Psorophora ferox*	7/18/2012	1
NEONTculicid6202	*Aedes atlanticus*	7/18/2012	1
NEONTculicid6195	*Aedes fulvus pallens*	7/18/2012	2
NEONTculicid6622	*Aedes fulvus pallens*	7/19/2012	2
NEONTculicid6192	*Aedes fulvus pallens*	7/18/2012	2
NEONTculicid6193	*Aedes fulvus pallens*	7/18/2012	2
NEONTculicid6196	*Aedes fulvus pallens*	7/18/2012	2
NEONTculicid6194	*Aedes fulvus pallens*	7/18/2012	2
NEONTculicid6621	*Aedes fulvus pallens*	7/19/2012	2
NEONTculicid6204	*Aedes infirmatus*	7/19/2012	3
NEONTculicid6208	*Aedes mitchellae*	7/19/2012	3
NEONTculicid6206	*Aedes infirmatus*	7/19/2012	3
NEONTculicid6199	*Psorophora columbiae*	7/19/2012	3
NEONTculicid6619	*Aedes fulvus pallens*	7/19/2012	3
NEONTculicid6198	*Psorophora columbiae*	7/19/2012	3

BOLD Sample ID	Scientific Name	Collection Date	Trap Location
NEONTculicid6197	*Anopheles perplexens*	8/8/2012	3
NEONTculicid6213	*Anopheles punctipennis*	7/19/2012	3
NEONTculicid6205	*Aedes infirmatus*	7/19/2012	3
NEONTculicid6207	*Aedes mitchellae*	7/19/2012	3
NEONTculicid6209	*Aedes mitchellae*	7/19/2012	3
NEONTculicid6210	*Aedes mitchellae*	7/19/2012	3
NEONTculicid6623	*Aedes atlanticus*	7/19/2012	4
NEONTculicid6624	*Aedes atlanticus*	7/19/2012	4
NEONTculicid6212	*Culex coronator*	8/8/2012	5
NEONTculicid6211	*Culex coronator*	8/8/2012	5
NEONTculicid6190	*Culex erraticus*	7/19/2012	5
NEONTculicid6625	*Culex coronator*	8/9/2012	6

6.7 Ticks

6.7.1 Site-Specific Methods

Tick drags were conducted at JERC in the spring and summer of 2012 to test protocol methods and calculate capture rates. No tick identification or pathogen testing was performed. For more information on this protocol and data product numbers see Appendix A.

6.7.2 Results

Table 48: Tick sampling results at JERC

Vegetation Type	Number of Plots Sampled	Tick Abundance (Mean)	Tick Abundance (stDev)	Total Number of Ticks Collected	Max Number of Ticks Collected	Number of Plots With No Ticks	Total Area Sampled (m^2)
Annual graminoid or forb	6	0	0	0	NA	6	1958
Evergreen open tree canopy	5	0.4	0.89	2	2	4	5973
Mixed evergreen/deciduous open tree canopy	4	0	0	0	NA	4	1481

Vegetation Type	Number of Plots Sampled	Tick Abundance (Mean)	Tick Abundance (stDev)	Total Number of Ticks Collected	Max Number of Ticks Collected	Number of Plots With No Ticks	Total Area Sampled (m^2)
Perennial graminoid grassland	4	0	0	0	NA	4	1401
Total	19	0.1	0.5	2	2	18	10813

Note: Land cover classes here match LANDFIRE (Landscape Fire and Resource Management Planning Tools; http://www.landfire.gov/) vegetation categories, rather than the NLCD land cover types employed in current protocols.

6.8 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[06], RD[07]).

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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 49: 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

Name	Description	Identification Code
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
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