TOS SITE CHARACTERIZATION REPORT: DOMAIN 11

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CHANGE RECORD

REVISION	DATE	ECO#	DESCRIPTION OF CHANGE
A	01/02/2018	ECO-05337	Initial Release
B	11/20/2018	ECO-05648	• Added soil pit information table • Added percent cover of bryophyte to the plant diversity table

TABLE OF CONTENTS

1 DESCRIPTION **1**
1.1 Purpose . . . 1
1.2 Scope . . . 1

2 RELATED DOCUMENTS AND ACRONYMS **1**
2.1 Applicable Documents . . . 1
2.2 Reference Documents . . . 1
2.3 Acronyms . . . 2

3 DOMAIN 11 OVERVIEW: SOUTHERN PLAINS DOMAIN **3**

4 CORE SITE- LBJ NATIONAL GRASSLAND (CLBJ) **6**
4.1 TOS Spatial Sampling Design . . . 7
4.2 Sampling Season Characterization: CLBJ . . . 12
4.3 Belowground Biomass . . . 13
4.3.1 Site-Specific Methods . . . 13
4.3.2 Results . . . 13
4.4 Plant Characterization and Phenology Species Selection . . . 16
4.4.1 Site-Specific Methods . . . 16
4.4.2 Results . . . 16
4.5 Beetles . . . 28
4.5.1 Site-Specific Methods . . . 28
4.6 Mosquitoes . . . 28
4.6.1 Site-Specific Methods . . . 28
4.7 Ticks . . . 28
4.7.1 Site-Specific Methods . . . 28
4.8 Species Reference Lists . . . 28

5 RELOCATABLE SITE 1- KLEMME RANGE RESEARCH STATION (OAES) **30**
5.1 TOS Spatial Sampling Design . . . 31
5.2 Sampling Season Characterization: OAES . . . 36
5.3 Belowground Biomass . . . 37
5.3.1 Site-Specific Methods . . . 37
5.3.2 Results . . . 37
5.4 Plant Characterization and Phenology Species Selection . . . 39
5.4.1 Site-Specific Methods . . . 39
5.4.2 Results . . . 40
5.5 Beetles . . . 48
5.5.1 Site-Specific Methods . . . 48
5.5.2 Results . . . 48
5.6 Mosquitoes . . . 50
5.6.1 Site-Specific Methods . . . 50
5.6.2 Results . . . 50

5.7 Ticks . . . 51
5.7.1 Site-Specific Methods . . . 51
5.8 Species Reference Lists . . . 51

6 REFERENCES **52**

7 APPENDIX A: DATA PRODUCT NUMBERS **52**

LIST OF TABLES AND FIGURES

Table 1 NLCD land cover classes and area within the TOS site boundary at CLBJ. . . . 10
Table 2 NLCD land cover classes and TOS plot numbers at CLBJ. . . . 10
Table 3 Number of Distributed Base Plots per NLCD land cover class per protocol at CLBJ. . . . 10
Table 4 Number of Tower Plots per protocol at CLBJ. . . . 11
Table 5 Average MODIS-EVI greenness dates for the NEON CLBJ site, based on data from 2003-2013 (DOY, with MM/DD in parentheses). . . . 13
Table 6 Soil Pit Information at CLBJ. . . . 13
Table 7 Fine root mass per depth increment (cm) at CLBJ. . . . 14
Table 8 Cumulative fine root mass as a function of depth (cm) at CLBJ. . . . 14
Table 9 Fine root biomass sampling summary data at CLBJ. . . . 15
Table 10 Site plant characterization and phenology species summary at CLBJ. . . . 16
Table 11 Per plot breakdown of species richness, diversity, and herbaceous cover at CLBJ. . . . 27
Table 12 NLCD land cover classes and area within the TOS site boundary at OAES. . . . 34
Table 13 NLCD land cover classes and TOS plot numbers at OAES. . . . 34
Table 14 Number of Distributed Base plots per NLCD land cover class per protocol at OAES. . . . 34
Table 15 Number of Tower Plots per protocol at OAES. . . . 35
Table 16 Average MODIS-EVI greenness dates for the NEON OAES site, based on data from 2003-2013 (DOY, with MM/DD in parentheses). . . . 37
Table 17 Soil Pit Information at OAES. . . . 37
Table 18 Fine root mass per depth increment (cm) at OAES. . . . 38
Table 19 Cumulative fine root mass as a function of depth (cm) at OAES. . . . 38
Table 20 Fine root biomass sampling summary data at OAES. . . . 39
Table 21 Site plant characterization and phenology species summary at OAES. . . . 40
Table 22 Per plot breakdown of species richness, diversity, and herbaceous cover at OAES. . . . 46
Table 23 Beetle identification results at OAES. . . . 48
Table 24 Mosquito identification results at OAES. . . . 50
Table 25 NEON data product names and descriptions. . . . 52

Figure 1 NEON project map with Domain 11 highlighted in red. . . . 3
Figure 2 Site boundaries within Domain 11. . . . 4
Figure 3 Phenocamera image for CLBJ. 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/. . . . 6

Figure 4 Map of TOS plot centroids within the NEON TOS sampling boundary at CLBJ. 8
Figure 5 Map of the tower airshed and TOS plot centroids at CLBJ. 9
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 CLBJ site. 12
Figure 7 Cumulative root mass by pit depth at CLBJ. 15
Figure 8 Phenocamera image for OAES. 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/. 30
Figure 9 Map of TOS plot centroids within the NEON TOS sampling boundary at OAES. 32
Figure 10 Map of the tower airshed and TOS plot centroids at OAES. 33
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 OAES site. 36
Figure 12 Cumulative root mass by pit depth at OAES. 39

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 two sites in the Southern Plains 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.011060	TIS Site Characterization Report
RD[05]	NEON.DOC.002416	AIS Site Characterization Report
RD[06]	NEON.DOC.003885	TOS Site Characterization Methods
RD[07]	NEON.DOC.000481	TOS Protocol and Procedure: Small Mammal Sampling
RD[08]	NEON.DOC.014041	TOS Protocol and Procedure: Breeding Landbird Abundance and Diversity
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 11 OVERVIEW: SOUTHERN PLAINS DOMAIN

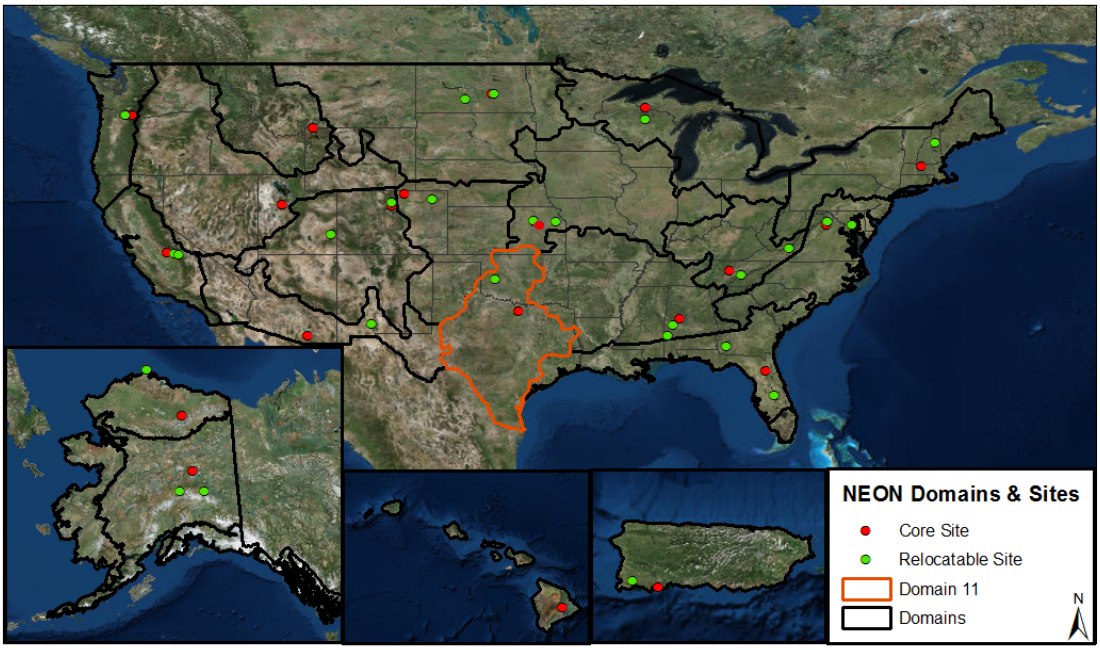

Figure 1: NEON project map with Domain 11 highlighted in red.

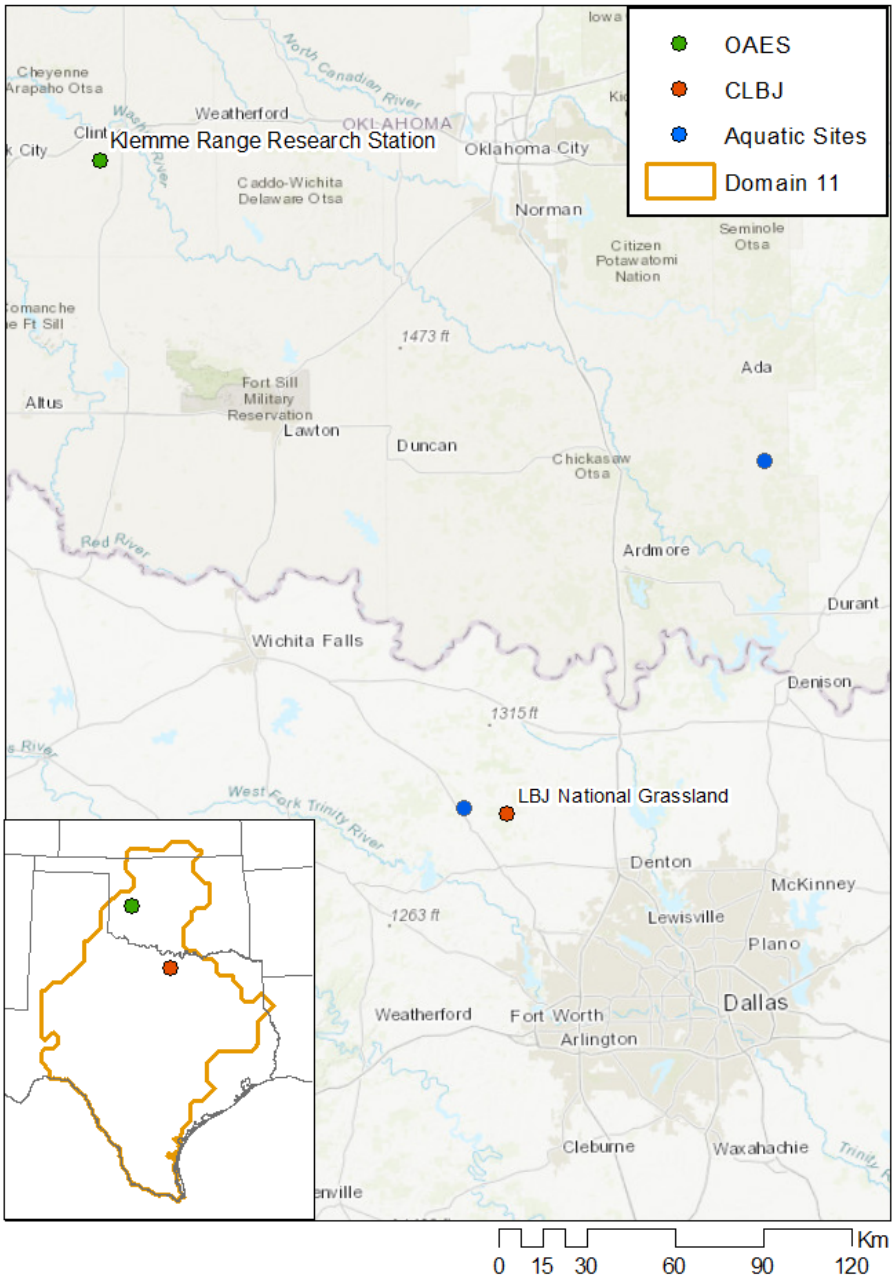

Figure 2: Site boundaries within Domain 11.

The Southern Plains Domain is a patchwork of forest and grassland habitats embedded in growing suburban communities. The two TOS sites have a variety of management practices, including prescribed burns and grazing. In addition, all TOS sampling boundaries overlap other research networks allowing opportunities for larger datasets and longer time series.

- States included in the domain: Texas, Oklahoma, Kansas
- Core site: LBJ National Grassland
- Relocatable 1: Klemme Range Research Station
- Science themes: Invasive Species

4 CORE SITE- LBJ NATIONAL GRASSLAND (CLBJ)

Located 50 kilometers north west of Denton, Texas, Caddo-LBJ National Grasslands represents a wildland site within the rapidly growing cities north of Dallas. Caddo-LBJ National Grasslands has fairly flat terrain and consists of a mosaic of oak-dominated forest and grasslands.

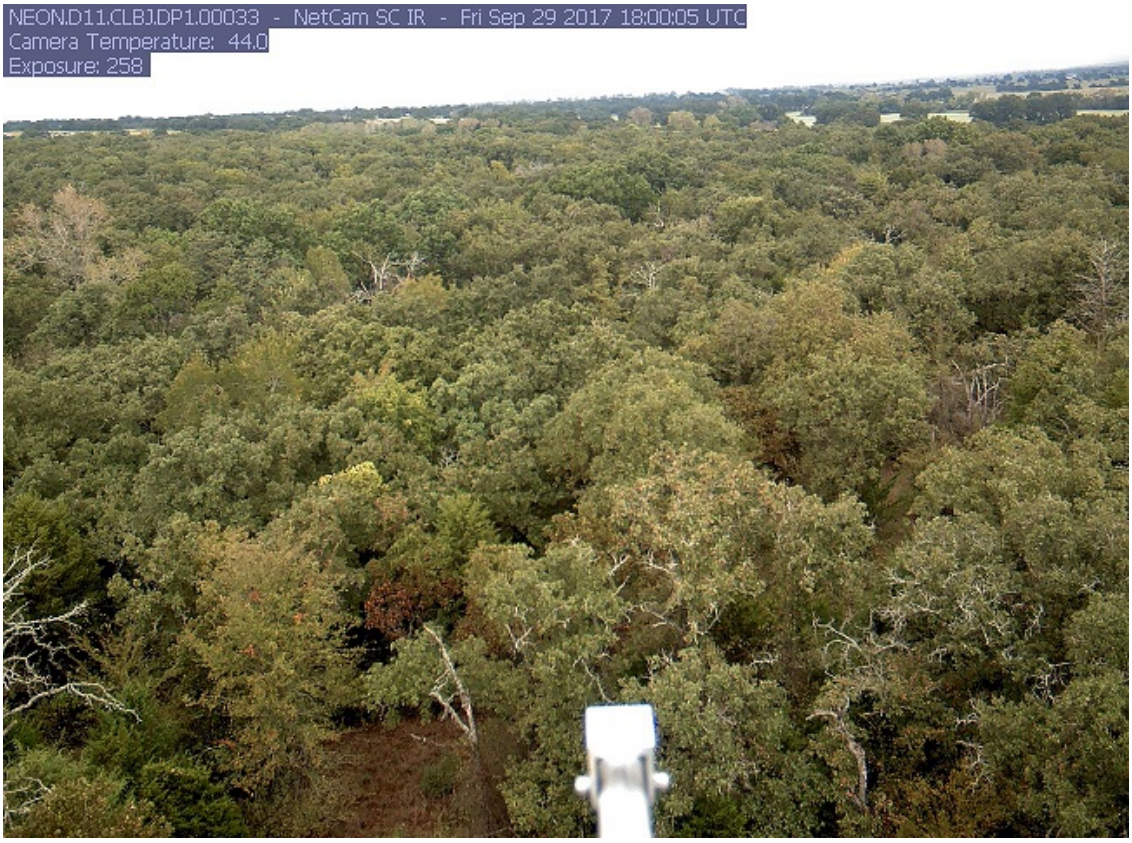

Figure 3: Phenocamera image for CLBJ. The phenocamera is located at the top of the NEON tower and faces north. Phenocamera images are available at https://phenocam.sr.unh.edu/webcam/network/table/.

Key Characteristics:

- Site host: U.S. Forest Service
- Located in: Wise County, Texas
- Sampling Area: 41.88 km^2
- Plot Elevation: 250-350m
- Dominant vegetation type: The dominant canopy species are post oak (*Quercus stellate*) and blackjack oak (*Q. marilandica*). Important grass species include little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardi*), Indiangrass (*Sorghastrum nutans*), and switchgrass (*Panicum virgatum*).
- General management: The site is managed by prescribed burns every 3-5 years to reduce fuel load and maintain an open understory. In addition, cattle graze the grasslands. Caddo-LBJ National Grasslands is

open to the public and offers a variety of recreation activites.

- The Pringle Creek Site is located west of NEON tower. See the AIS site characterization report for more details (RD[05]).
- Plot Selection: NEON TOS Plots were allocated across the site following NEON standard criteria and avoiding existing research.

4.1 TOS Spatial Sampling Design

TOS Distributed Plots were allocated at CLBJ 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.

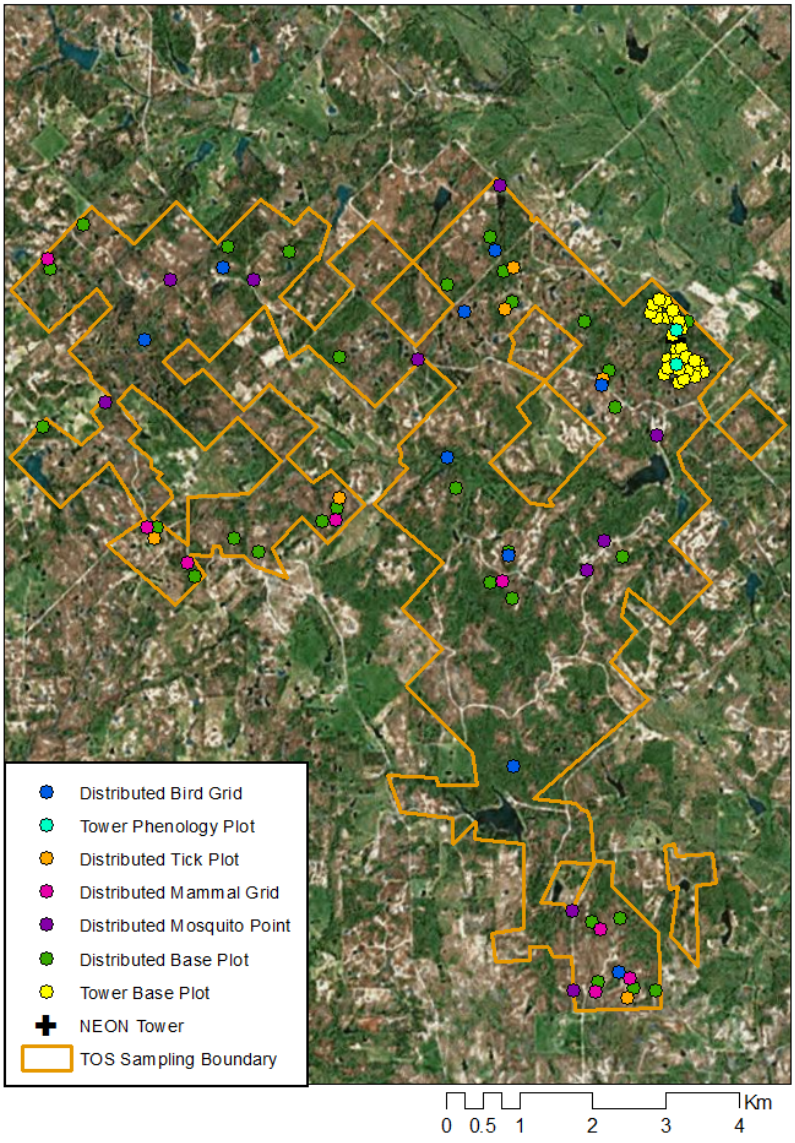

Figure 4: Map of TOS plot centroids within the NEON TOS sampling boundary at CLBJ.

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

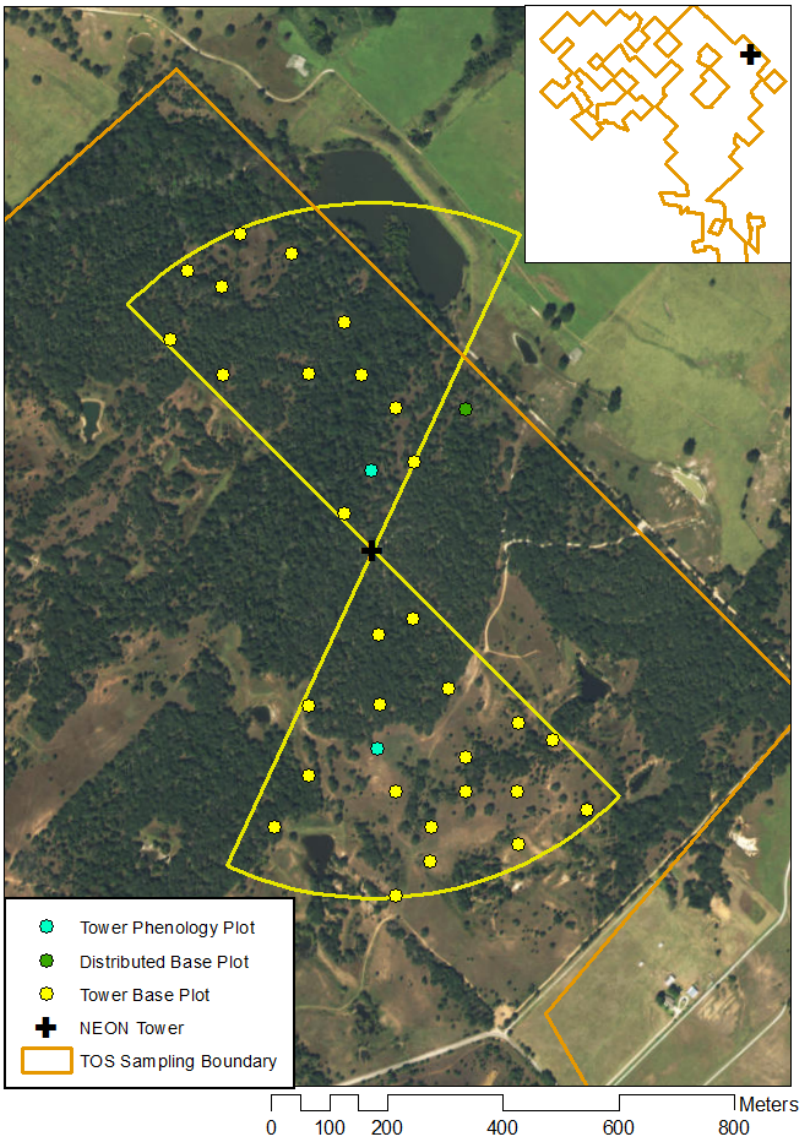

Figure 5: Map of the tower airshed and TOS plot centroids at CLBJ.

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 CLBJ.

NLCD Class	Site Area (km^2)	Percent (%)
Deciduous Forest	18.99	45.8
Grassland Herbaceous	18.88	45.52
Developed Open Space	2.71	6.53
Open Water	0.44	1.07
Evergreen Forest	0.42	1.02
Developed Low Intensity	0.02	0.04

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 CLBJ.

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Base Plot	Deciduous Forest	15
Distributed	Base Plot	Grassland Herbaceous	15
Distributed	Bird Grid	Deciduous Forest	5
Distributed	Bird Grid	Grassland Herbaceous	4
Distributed	Mammal Grid	Deciduous Forest	4
Distributed	Mammal Grid	Grassland Herbaceous	4
Distributed	Mosquito Point	Deciduous Forest	5
Distributed	Mosquito Point	Grassland Herbaceous	5
Distributed	Tick Plot	Deciduous Forest	3
Distributed	Tick Plot	Grassland Herbaceous	3
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 types within the airshed include: deciduous forest and grassland herbaceous.

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

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Deciduous Forest	Beetles	5
Distributed	Base Plot	Grassland Herbaceous	Beetles	5

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Deciduous Forest	Canopy Foliage Chemistry	5
Distributed	Base Plot	Grassland Herbaceous	Canopy Foliage Chemistry	5
Distributed	Base Plot	Deciduous Forest	Coarse Downed Wood	10
Distributed	Base Plot	Grassland Herbaceous	Coarse Downed Wood	10
Distributed	Base Plot	Deciduous Forest	Digital Hemispherical Photos for Leaf Area Index	10
Distributed	Base Plot	Grassland Herbaceous	Digital Hemispherical Photos for Leaf Area Index	10
Distributed	Base Plot	Deciduous Forest	Herbaceous Biomass	10
Distributed	Base Plot	Grassland Herbaceous	Herbaceous Biomass	10
Distributed	Base Plot	Deciduous Forest	Plant Diversity	15
Distributed	Base Plot	Grassland Herbaceous	Plant Diversity	15
Distributed	Base Plot	Deciduous Forest	Soil Biogeochemistry	3
Distributed	Base Plot	Grassland Herbaceous	Soil Biogeochemistry	3
Distributed	Base Plot	Deciduous Forest	Soil Microbes	3
Distributed	Base Plot	Grassland Herbaceous	Soil Microbes	3
Distributed	Base Plot	Deciduous Forest	Vegetation Structure	10
Distributed	Base Plot	Grassland Herbaceous	Vegetation Structure	10

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 CLBJ.

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 the total TOS Tower Base Plot number.

4.2 Sampling Season Characterization: CLBJ

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.

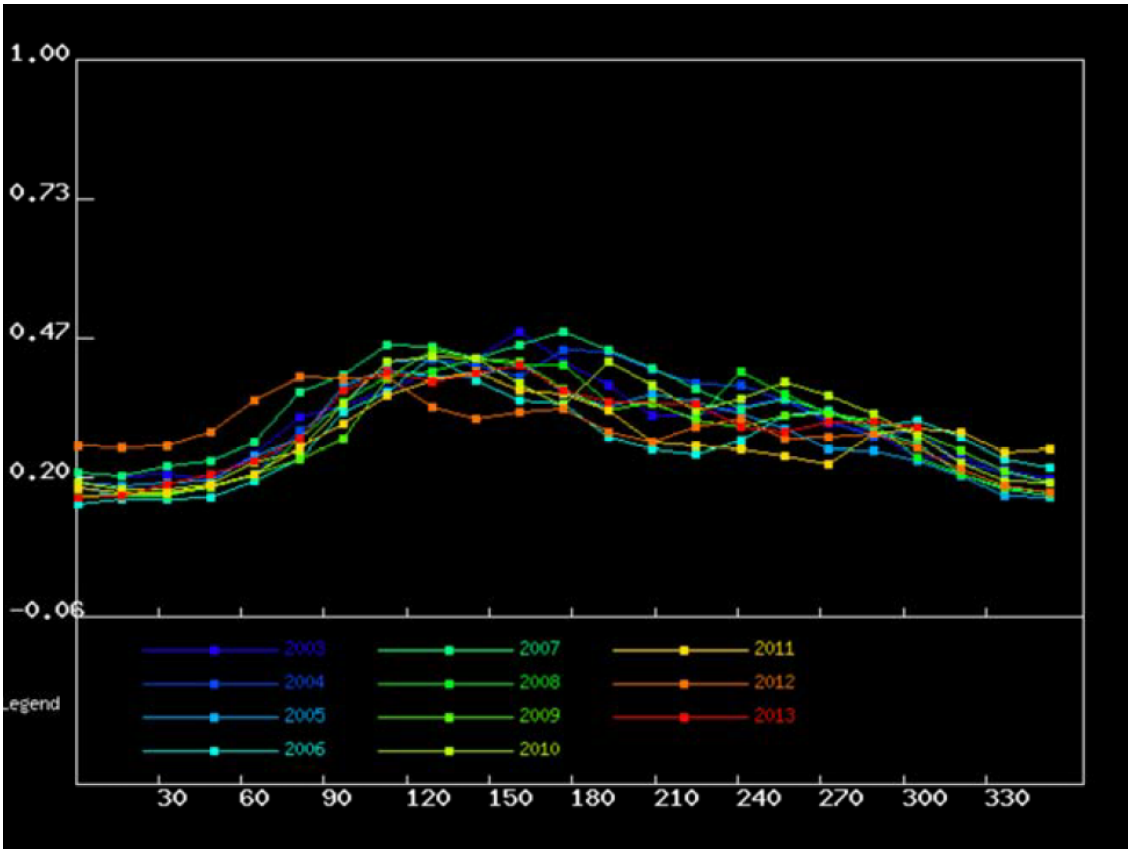

Figure 6: MODIS-EVI greenness (y-axis = EVI ratio) as a function of time (x-axis = DOY) for the years 2003-2013 at the NEON CLBJ site.

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

Phenology Peak	Average Increase	Average Maximum	Average Decrease	Average Minimum
Peak 1	60 (03/01)	135 (05/15)	175 (06/24)	295 (10/22)
Peak 2	215 (08/03)	230 (08/18)	265 (09/22)	320 (11/20)

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: 40.25 km x 40.25 km box, centroid lat: 33.40196, centroid long: -97.571005 (WGS84 datum)

4.3 Belowground Biomass

4.3.1 Site-Specific Methods

Belowground biomass characterization data were collected down to a depth of 200 cm by NEON staff in March 2016. Since the NEON protocol for long-term, operational sampling of belowground biomass only collects data to a depth of 30 cm, the belowground biomass site characterization data are critical for scaling belowground biomass measurements to greater depths; see the TOS Science Design for Plant Biomass, Productivity, and Leaf Area Index (AD[7]) for more information. Samples were collected following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Roots were sorted to two diameter size categories ($\leq$ 2 mm and 2-30 mm) and by root status (live or dead). The tables below summarize all the belowground biomass less than or equal to 30 mm diameter; size class data and more information can be found by searching the NEON data portal for the data product numbers in Appendix A.

4.3.2 Results

Table 6: Soil Pit Information at CLBJ.

Latitude	Longitude	Soil Family	Soil Order
NA	NA	Fine - mixed - active - thermic Udic Paleustalfs	Alfisol

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

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

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
0	10	3.6	0.42
10	20	3.82	2.21
20	30	1.68	1.27
30	40	5.43	8.24
40	50	1.16	0.61
50	60	6.66	4.98
60	70	4.38	3.3
70	80	1.32	0.75
80	90	6.93	7.96
90	100	7.52	11.35
100	120	3.53	5.33
120	140	0.65	0.21
140	160	0.21	0.18
160	180	0	0
180	200	0	0

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

Upper Depth	Lower Depth	Mean Cumulative (g per m^2)	Cumulative Std Dev
0	10	359.9	41.94
10	20	741.47	257.12
20	30	909.13	353.99
30	40	1452.33	1063.69
40	50	1568.1	1047.28
50	60	2234.2	710.07
60	70	2672.1	837.17
70	80	2804.17	804.08
80	90	3497.07	1141.47
90	100	4248.87	2090.89
100	120	4955.57	2242.33
120	140	5084.93	2256.14
140	160	5126.33	2240.48
160	180	5126.33	2240.48

Upper Depth	Lower Depth	Mean Cumulative (g per m^2)	Cumulative Std Dev
180	200	5126.33	2240.48

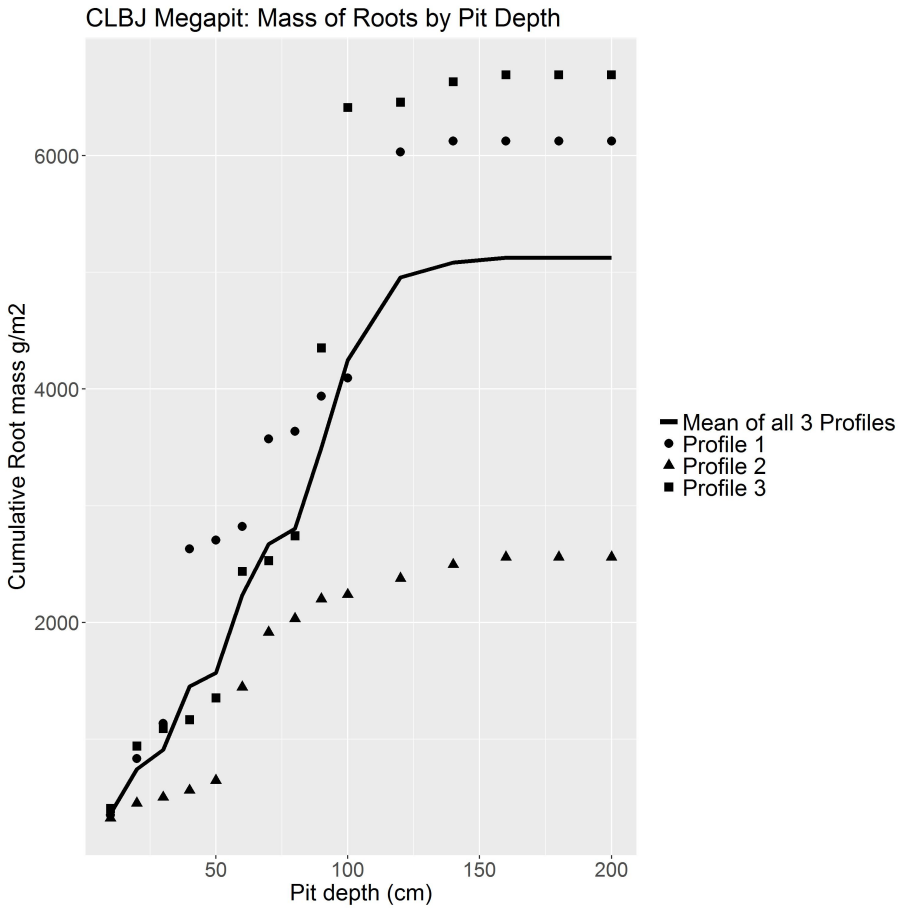

Figure 7: Cumulative root mass by pit depth at CLBJ.

Table 9: Fine root biomass sampling summary data at CLBJ.

Total Pit Depth (cm)	200
Total Mean Cumulative Mass at 30cm (g per m^2)	909.13
Total Mean Cumulative Mass at 100cm (g per m^2)	4248.87
Total Mean Cumulative Mass (g per m^2)	5126.33

4.4 Plant Characterization and Phenology Species Selection

4.4.1 Site-Specific Methods

Plant characterization data were collected by NEON Staff. Vegetation structure data were collected in February of 2017 and plant diversity data were collected in June and July of 2017. 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 CLBJ.

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
QUST	*Quercus stellata* Wangenh.	1	<1	<1	<1
2PLANT	Unknown plant	2	<1	0.01	<1
QUMA3	*Quercus marilandica* Mùnchh	3	<1	<1	<1
CELA	*Celtis laevigata* Willd.	4	<1	<1	<1
BOISS	*Bothriochloa ischaemum* (L.) Keng var. *songarica* (Rupr. ex Fisch. & C.A. Mey.) Celarier & Harlan	5	<1	<1	<1
ULCR	*Ulmus crassifolia* Nutt.	6	<1	<1	<1

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
SCSC	*Schizachyrium scoparium* (Michx.) Nash	7	<1	<1	<1
QUERC	*Quercus* sp.	8	<1	<1	<1
ULMUS	*Ulmus* sp.	9	<1	<1	<1
SMBO2	*Smilax bona-nox* L.	10	<1	<1	<1
JUVI	*Juniperus virginiana* L.	11	<1	<1	<1
SILA20	*Sideroxylon lanuginosum* Michx.	12	<1	0.02	<1
ULAL	*Ulmus alata* Michx.	13	<1	<1	<1
AMPS	*Ambrosia psilostachya* DC.	14	<1	<1	<1
SYOR	*Symphoricarpos orbiculatus* Moench	15	<1	<1	<1
ERIN	*Eragrostis intermedia* Hitchc.	16	<1	<1	<1
BOCU	*Bouteloua curtipendula* (Michx.) Torr.	17	<1	<1	<1
DIOL	*Dichanthelium oligosanthes* (Schult.) Gould	18	<1	<1	<1
SCCI	*Scleria ciliata* Michx.	19	<1	<1	<1
TORA2	*Toxicodendron radicans* (L.) Kuntze	20	<1	<1	<1
CELTI	*Celtis* sp.	21	<1	<1	<1
SONU2	*Sorghastrum nutans* (L.) Nash	22	<1	<1	<1
FRCA13	*Frangula caroliniana* (Walter) A. Gray	23	<1	<1	<1
PASE5	*Paspalum setaceum* Michx.	24	<1	<1	<1
CODR	*Cornus drummondii* C.A. Mey.	25	<1	<1	<1
PRME	*Prunus mexicana* S. Watson	26	<1	<1	<1
BOHI2	*Bouteloua hirsuta* Lag.	27	<1	<1	<1
CAAM2	*Callicarpa americana* L.	28	<1	<1	<1

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
TRFL2	*Tridens flavus* (L.) Hitchc.	29	<1	<1	<1
BOISI	*Bothriochloa ischaemum* (L.) Keng var. *ischaemum*	30	<1	<1	<1
POACEA	Poaceae sp.	31	<1	<1	<1
PAQU2	*Parthenocissus quinquefolia* (L.) Planch.	32	<1	<1	<1
DISP2	*Dichanthelium sphaerocarpon* (Elliott) Gould	33	<1	<1	<1
GAVO	*Galactia volubilis* (L.) Britton	34	<1	<1	<1
BOGR2	*Bouteloua gracilis* (Willd. ex Kunth) Lag. ex Griffiths	35	<1	<1	<1
PRUNU	*Prunus* sp.	36	<1	<1	<1
SYER	*Symphyotrichum ericoides* (L.) G.L. Nesom	37	<1	<1	<1
BOIS	*Bothriochloa ischaemum* (L.) Keng	38	<1	<1	<1
ANTE2	*Andropogon ternarius* Michx.	39	<1	<1	<1
CYDA	*Cynodon dactylon* (L.) Pers.	40	<1	<1	<1
PAAN	*Panicum anceps* Michx.	41	<1	<1	<1
ERSP	*Eragrostis spectabilis* (Pursh) Steud.	42	<1	<1	<1
HEAM	*Helenium amarum* (Raf.) H. Rock	43	<1	<1	<1
SPCO16	*Sporobolus compositus* (Poir.) Merr.	44	<1	<1	<1
ROSE2	*Rosa setigera* Michx.	45	<1	<1	<1
DILI2	*Dichanthelium linearifolium* (Scribn. ex Nash) Gould	46	<1	<1	<1
DIAC2	*Dichanthelium acuminatum* (Sw.) Gould & C.A. Clark	47	<1	<1	<1

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
ERST3	*Erigeron strigosus* Muhl. ex Willd.	47	<1	<1	<1
VITIS	*Vitis* sp.	49	<1	<1	<1
HEGE	*Helianthemum georgianum* Chapm.	50	<1	<1	<1
LETE	*Lechea tenuifolia* Michx.	50	<1	<1	<1
NELU2	*Neptunia lutea* (Leavenworth) Benth.	52	<1	<1	<1
LECU	*Lespedeza cuneata* (Dum. Cours.) G. Don	53	<1	<1	<1
CAREX	*Carex* sp.	54	<1	<1	<1
DITE2	*Diodia teres* Walter	54	<1	<1	<1
COCY	*Coelorachis cylindrica* (Michx.) Nash	56	<1	<1	<1
PRGR	*Prunus gracilis* Engelm. & A. Gray	56	<1	<1	<1
CHFA2	*Chamaecrista fasciculata* (Michx.) Greene	58	<1	<1	<1
LEST5	*Lespedeza stuevei* Nutt.	58	<1	<1	<1
LEMU3	*Lechea mucronata* Raf.	60	<1	<1	<1
SYPAP2	*Symphyotrichum patens* (Aiton) G.L. Nesom var. *patens*	61	<1	<1	<1
LEVI7	*Lespedeza virginica* (L.) Britton	62	<1	<1	<1
COCA5	*Conyza canadensis* (L.) Cronquist	63	<1	<1	<1
SACA3	*Sabatia campestris* Nutt.	63	<1	<1	<1
STBI2	*Stylosanthes biflora* (L.) Britton, Sterns & Poggenb.	65	<1	<1	<1
SONU2	*Sorghastrum nutans* (L.) Nash	66	<1	<1	<1
OXST	*Oxalis stricta L* Oxalis stricta L	67	<1	<1	<1
SEPU8	*Setaria pumila* (Poir.) Roem. & Schult.	68	<1	<1	<1

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
FIAN	*Fimbristylis annua* (All.) Roem. & Schult.	69	<1	<1	<1
PAVI2	*Panicum virgatum* L.	69	<1	<1	<1
RUHIP	*Rudbeckia hirta* L. var. *pulcherrima* Farw.	69	<1	<1	<1
GLTR	*Gleditsia triacanthos* L.	72	<1	<1	<1
CHPI8	*Chrysopsis pilosa Nutt.* Chrysopsis pilosa Nutt.	73	<1	<1	<1
DAPU5	*Dalea purpurea* Vent.	73	<1	<1	<1
VEBA	*Vernonia baldwinii* Torr.	73	<1	<1	<1
GAPI2	*Galium pilosum* Aiton	76	<1	<1	<1
LIPUM2	*Liatris punctata Hook.* var. *mucronata* (DC.) B.L. Turner	78	<1	<1	<1
RHCO	*Rhus copallinum* L.	79	<1	<1	<1
GAAE	*Gaillardia aestivalis* (Walter) H. Rock	80	<1	<1	<1
BREU	*Brickellia eupatorioides* (L.) Shinners	81	<1	<1	<1
LOUN	*Lotus unifoliolatus* (Hook.) Benth.	82	<1	<1	<1
TRRA5	*Tragia ramosa* Torr.	82	<1	<1	<1
SODI	*Solanum dimidiatum* Raf.	84	<1	<1	<1
RUOK	*Rubus oklahomus* L.H. Bailey	85	<1	<1	<1
INMI	*Indigofera miniata* Ortega	86	<1	<1	<1
JUMA4	*Juncus marginatus* Rostk.	86	<1	<1	<1
CRATA	*Crataegus* sp.	88	<1	<1	<1
ELCA4	*Elymus canadensis* L.	89	<1	<1	<1
CRCR2	*Crataegus crus-galli* L.	90	<1	<1	<1
LEPR	*Lespedeza procumbens* Michx.	91	<1	<1	<1
CYRE5	*Cyperus retrorsus* Chapm.	92	<1	<1	<1
DESE	*Desmodium sessilifolium* (Torr.) Torr. & A. Gray	92	<1	<1	<1

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
GECA7	*Geum canadense* Jacq.	92	<1	<1	<1
DYLI	*Dyschoriste linearis* (Torr. & A. Gray) Kuntze	95	<1	<1	<1
LIATR	*Liatris* sp.	95	<1	<1	<1
SPCR	*Sporobolus cryptandrus* (Torr.) A. Gray	95	<1	<1	<1
DICO6	*Digitaria cognata* (Schult.) Pilg.	98	<1	<1	<1
SACA15	*Sanicula canadensis* L.	99	<1	<1	<1
COCA	*Cocculus carolinus* (L.) DC.	100	<1	<1	<1
ERHI	*Eragrostis hirsuta* (Michx.) Nees	101	<1	<1	<1
OPMA2	*Opuntia macrorhiza* Engelm.	101	<1	<1	<1
PAHA	*Panicum hallii* Vasey	101	<1	<1	<1
SOLID	*Solidago* sp.	101	<1	<1	<1
SPORO	*Sporobolus* sp.	101	<1	<1	<1
RHLA5	*Rhynchosia latifolia* Nutt. ex Torr. & A. Gray	106	<1	<1	<1
PRAN3	*Prunus angustifolia* Marshall	107	<1	<1	<1
ACMI2	*Achillea millefolium* L.	108	<1	<1	<1
CRCA6	*Croton capitatus* Michx.	109	<1	<1	<1
PACO2	*Panicum coloratum* L.	109	<1	<1	<1
QUSH	*Quercus shumardii* Buckley	111	<1	<1	<1
CHLA5	*Chasmanthium latifolium* (Michx.) Yates	112	<1	<1	<1
ARIST	*Aristida* sp.	113	<1	<1	<1
CHVE2	*Chloris verticillata* Nutt.	113	<1	<1	<1
LIMET	*Linum medium* (Planch.) Britton var. *texanum* (Planch.) Fernald	113	<1	<1	<1
VEHA	*Verbena halei* Small	116	<1	<1	<1

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
BOLA2	*Bothriochloa laguroides* (DC.) Herter	117	<1	<1	<1
PHCI4	*Physalis cinerascens* (Dunal) Hitchc.	117	<1	<1	<1
RHHA	*Rhynchospora harveyi* W. Boott	117	<1	<1	<1
VEHE	*Verbesina helianthoides* Michx.	117	<1	<1	<1
CABE6	*Calylophus berlandieri* Spach	121	<1	<1	<1
DEIL	*Desmanthus illinoensis* (Michx.) MacMill. ex B.L. Rob. & Fernald	121	<1	<1	<1
WOOB2	*Woodsia obtusa* (Spreng.) Torr.	121	<1	<1	<1
ARLU	*Artemisia ludoviciana* Nutt.	124	<1	<1	<1
CYLU2	*Cyperus lupulinus* (Spreng.) Marcks	124	<1	<1	<1
POHI2	*Polygonum hispidum* Kunth	124	<1	<1	<1
TRBE4	*Tragia betonicifolia* Nutt.	124	<1	<1	<1
DIVI5	*Diospyros virginiana* L.	128	<1	<1	<1
LISU4	*Linum sulcatum* Riddell	128	<1	<1	<1
SOMI2	*Solidago missouriensis* Nutt.	128	<1	<1	<1
CORNU	*Cornus* sp.	131	<1	<1	<1
CYEC2	*Cyperus echinatus* (L.) Alph. Wood	132	<1	<1	<1
DESMO	*Desmodium* sp.	133	<1	<1	<1
GYAM	*Gymnopogon ambiguus* (Michx.) Britton, Sterns & Poggenb.	133	<1	<1	<1
JUIN2	*Juncus interior* Wiegand	135	<1	<1	<1
PELA10	*Penstemon laxiflorus* Pennell	135	<1	<1	<1

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
VETH	*Verbascum thapsus* L.	135	<1	<1	<1
CHAS	*Chaetopappa asteroides* Nutt. ex DC.	139	<1	<1	<1
GACI2	*Galium circaezans* Michx.	139	<1	<1	<1
MOPU	*Monarda punctata* L.	139	<1	<1	<1
APCA	*Apocynum cannabinum* L.	142	<1	<1	<1
BOUTE	*Bouteloua* sp.	142	<1	<1	<1
CITR2	*Cissus trifoliata* (L.) L.	142	<1	<1	<1
DESMA	*Desmanthus* sp.	142	<1	<1	<1
PADI3	*Paspalum dilatatum* Poir.	142	<1	<1	<1
SCPA	*Schedonnardus paniculatus* (Nutt.) Trel.	142	<1	<1	<1
VESC	*Verbena scabra* Vahl	142	<1	<1	<1
CLMA4	*Clitoria mariana* L.	149	<1	<1	<1
EUDE4	*Euphorbia dentata Michx.* Euphorbia dentata Michx.	149	<1	<1	<1
HYDR	*Hypericum drummondii* (Grev. & Hook.) Torr. & A. Gray	149	<1	<1	<1
OLBO	*Oldenlandia boscii* (DC.) Chapm.	149	<1	<1	<1
ACMO4	*Acalypha monococca* (Engelm. ex A. Gray) Lill. W. Mill. & Gandhi	154	<1	<1	<1
BORI	*Bouteloua rigidiseta* (Steud.) Hitchc.	154	<1	<1	<1
ELTO2	*Elephantopus tomentosus* L.	154	<1	<1	<1
PADI7	*Panicum diffusum* Sw.	154	<1	<1	<1
BRAR5	*Bromus arvensis* L.	159	<1	<1	<1
CYRE14	*Cyperus retroflexus* Buckley	159	<1	<1	<1
GASI	*Gaura sinuata* Nutt. ex Ser.	159	<1	<1	<1
MORU2	*Morus rubra* L.	159	<1	<1	<1

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
PERH2	*Pediomelum rhombifolium* (Torr. & A. Gray) Rydb.	159	<1	<1	<1
ANPA9	*Antennaria parlinii* Fernald	164	<1	<1	<1
CAAU6	*Carex austrina* (Small) Mack.	164	<1	<1	<1
ERSE2	*Eragrostis sessilispica* Buckley	164	<1	<1	<1
LIIN2	*Lithospermum incisum* Lehm.	164	<1	<1	<1
RHGL	*Rhus glabra* L.	164	<1	<1	<1
CYPER	*Cyperus* sp.	169	<1	<1	<1
DIGIT2	*Digitaria* sp.	169	<1	<1	<1
FABACE	Fabaceae sp.	169	<1	<1	<1
POVE	*Polygala verticillata* L.	169	<1	<1	<1
AMDR	*Amphiachyris dracunculoides* (DC.) Nutt.	173	<1	<1	<1
BULBO	*Bulbostylis* sp.	173	<1	<1	<1
CAEM2	*Carex emoryi* Dewey	173	<1	<1	<1
COER	*Commelina erecta* L.	173	<1	<1	<1
CRGL2	*Croton glandulosus* L.	173	<1	<1	<1
IPPA	*Ipomoea pandurata* (L.) G. Mey.	173	<1	<1	<1
PANIC	*Panicum* sp.	173	<1	<1	<1
PHAM4	*Phytolacca americana* L.	173	<1	<1	<1
PLAR3	*Plantago aristata* Michx.	173	<1	<1	<1
PYGR2	*Pyrrhopappus grandiflorus* (Nutt.) Nutt.	173	<1	<1	<1
YUAR2	*Yucca arkansana* Trel.	173	<1	<1	<1
YUCCA	*Yucca* sp.	185	<1	<1	<1
ANVI2	*Andropogon virginicus* L.	186	<1	<1	<1
CRSA4	*Crotalaria sagittalis* L.	186	<1	<1	<1
CYCR6	*Cyperus croceus* Vahl	186	<1	<1	<1

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
ERCA	*Eragrostis capillaris* (L.) Nees	186	<1	<1	<1
GECA5	*Geranium carolinianum* L.	186	<1	<1	<1
LALU	*Lactuca ludoviciana* (Nutt.) Riddell	186	<1	<1	<1
MUSC	*Muhlenbergia schreberi* J.F. Gmel.	186	<1	<1	<1
POIN4	*Polygala incarnata* L.	186	<1	<1	<1
VUOC	*Vulpia octoflora* (Walter) Rydb.	186	<1	<1	<1
AMCO2	*Ampelopsis cordata Michx.* Ampelopsis cordata Michx.	195	<1	<1	<1
ANGE	*Andropogon gerardii* Vitman	195	<1	<1	<1
COAR4	*Convolvulus arvensis* L.	195	<1	<1	<1
ERSE	*Eragrostis secundiflora* J. Presl	195	<1	<1	<1
LEPID	*Lepidium* sp.	195	<1	<1	<1
LINUM	*Linum* sp.	195	<1	<1	<1
LUGL	*Ludwigia glandulosa* Walter	195	<1	<1	<1
OLNI	*Oligoneuron nitidum* (Torr. & A. Gray) Small	195	<1	<1	<1
PHPA29	*Phemeranthus parviflorus* (Nutt.) Kiger	195	<1	<1	<1
PLPA2	*Plantago patagonica* Jacq.	195	<1	<1	<1
RHTR	*Rhus trilobata* Nutt.	195	<1	<1	<1
SOEL	*Solanum elaeagnifolium* Cav.	195	<1	<1	<1
VEVI3	*Verbesina virginica* L.	195	<1	<1	<1
VIRU	*Viburnum rufidulum* Raf.	195	<1	<1	<1
XATE	*Xanthisma texanum* DC.	195	<1	<1	<1
ACGR2	*Acalypha gracilens* A. Gray	211	<1	<1	<1
AGROS2	*Agrostis* sp.	211	<1	<1	<1

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
ASST	*Asclepias stenophylla* A. Gray	211	<1	<1	<1
BIFR	*Bidens frondosa* L.	211	<1	<1	<1
CARYA	*Carya* sp.	211	<1	<1	<1
CITE2	*Cirsium texanum* Buckley	211	<1	<1	<1
CYRE2	*Cyperus reflexus* Vahl	211	<1	<1	<1
DICHA2	*Dichanthelium* sp.	211	<1	<1	<1
ERIGE2	*Erigeron* sp.	211	<1	<1	<1
EVPR	*Evax prolifera* Nutt. ex DC.	211	<1	<1	<1
GERAN	*Geranium* sp.	211	<1	<1	<1
HYPER	*Hypericum* sp.	211	<1	<1	<1
JUNCU	*Juncus* sp.	211	<1	<1	<1
LASE	*Lactuca serriola* L.	211	<1	<1	<1
NALE3	*Nassella leucotricha* (Trin. & Rupr.) Pohl	211	<1	<1	<1
OPUNT	*Opuntia* sp.	211	<1	<1	<1
PEDIO2	*Pediomelum* sp.	211	<1	<1	<1
PHLO4	*Physalis longifolia* Nutt.	211	<1	<1	<1
POHY2	*Polygonum hydropiperoides* Michx.	211	<1	<1	<1
PORA3	*Polygonum ramosissimum* Michx.	211	<1	<1	<1
PYCA2	*Pyrrhopappus carolinianus* (Walter) DC.	211	<1	<1	<1
SEPA10	*Setaria parviflora* (Poir.) KerguÃ©len	211	<1	<1	<1
SMTA2	*Smilax tamnoides* L.	211	<1	<1	<1
TOAR	*Torilis arvensis* (Huds.) Link	211	<1	<1	<1
TRLE3	*Triodanis leptocarpa* (Nutt.) Nieuwl.	211	<1	<1	<1
TRTE4	*Triodanis texana* McVaugh	211	<1	<1	<1
OPUNTSPP	*Opuntia* sp.	238	<1	<1	<1

Note:Taxon IDs and scientific names are based on the USDA Plants database (plants.usda.gov). For logistical reasons some plant characterization data was taken after a prescribed burn creating difficult conditions. As a result this site has a higher number of “unknown plant” identifications.

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

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover	Bryophyte Percent Cover
CLBJ_001	52	3.1	177	0.5
CLBJ_002	41	2.29	218	0.5
CLBJ_003	44	3.25	143	1.17
CLBJ_004	40	2.1	189	0
CLBJ_005	22	1.65	209	0
CLBJ_006	51	2.78	312	0
CLBJ_007	41	2.24	235	0
CLBJ_008	19	2.26	88	0
CLBJ_009	37	2.98	176	0
CLBJ_010	57	3.31	156	0
CLBJ_011	37	2.38	74	0
CLBJ_012	28	1.67	177	0
CLBJ_013	40	2.79	131	0
CLBJ_014	56	3.31	231	0
CLBJ_015	46	2.76	277	0
CLBJ_016	34	2.73	145	0
CLBJ_017	43	2.95	146	0
CLBJ_018	52	3.48	142	0
CLBJ_019	40	2.72	139	0
CLBJ_020	34	2.34	141	0
CLBJ_021	13	1.93	65	0
CLBJ_022	34	2.95	120	0
CLBJ_023	48	3.12	141	0
CLBJ_024	40	2.52	243	0
CLBJ_025	56	3.04	217	0
CLBJ_026	49	3	191	0
CLBJ_027	29	2.3	134	0
CLBJ_028	16	2.07	41	0
CLBJ_029	36	2.84	133	0

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover	Bryophyte Percent Cover
CLBJ_030	53	2.82	206	0
Bryophyte Mean				0.07

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.

4.5 Beetles

4.5.1 Site-Specific Methods

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

4.6 Mosquitoes

4.6.1 Site-Specific Methods

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

4.7 Ticks

4.7.1 Site-Specific Methods

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

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[07], RD[08]).

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5 RELOCATABLE SITE 1- KLEMME RANGE RESEARCH STATION (OAES)

Approximately 130 kilometers west of Oklahoma City, OAES is a rolling upland prairie site. OAES is near the mid-point of the Rolling Red Plains which extend from south of the Red River to north of the Oklahoma/Kansas border.

Figure 8: Phenocamera image for OAES. 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: Oklahoma State University, Oklahoma Agricultural Experimental Station
- Located in: Washita County, Oklahoma
- Sampling Area: 6.2 km^2
- Plot Elevation: 480-535m
- Dominant vegetation type: The primary crop in the Rolling Red Plains Area is wheat. Within the site the shortgrass grassland is interspersed with pockets of shrubs and small stature oaks. Dominant grasses include buffalo grass (*Bouteloua dactyloides*) and purple three-awn (*Aristida purpurea*). Broom snakeweed (*Gutierrezia sarothrae*) comprises the majority of the patchy shrub cover.
- General management: The Klemme Research Station is the result of the generous donation of 1,000 acres and the associated facilities by Marvin Klemme in 1988 to the Division of Agricultural Sciences and Natu-

ral Resources and Oklahoma State University (Marvin Klemme Range Research Station, 2017). This site has management units that are burned every 4 years (mimicking natural fire frequency) as well as cattle grazing.

- 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 Distributed Plots were allocated at OAES 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.

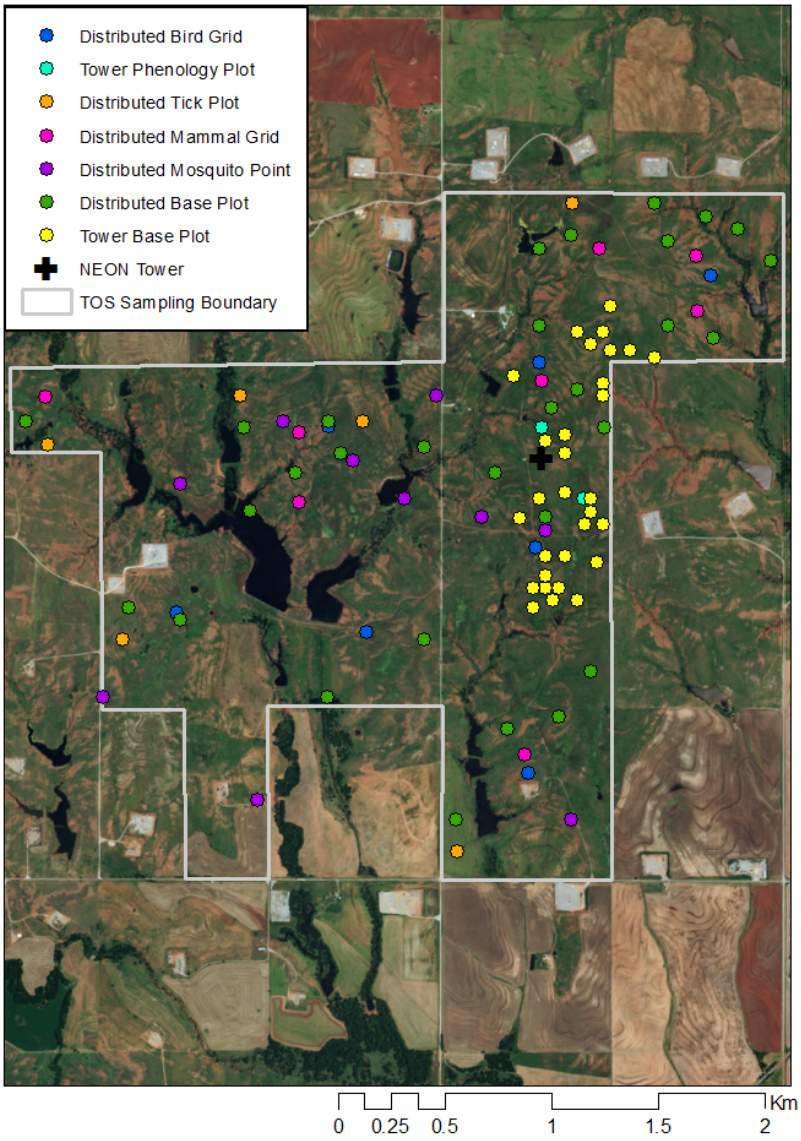

Figure 9: Map of TOS plot centroids within the NEON TOS sampling boundary at OAES.

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

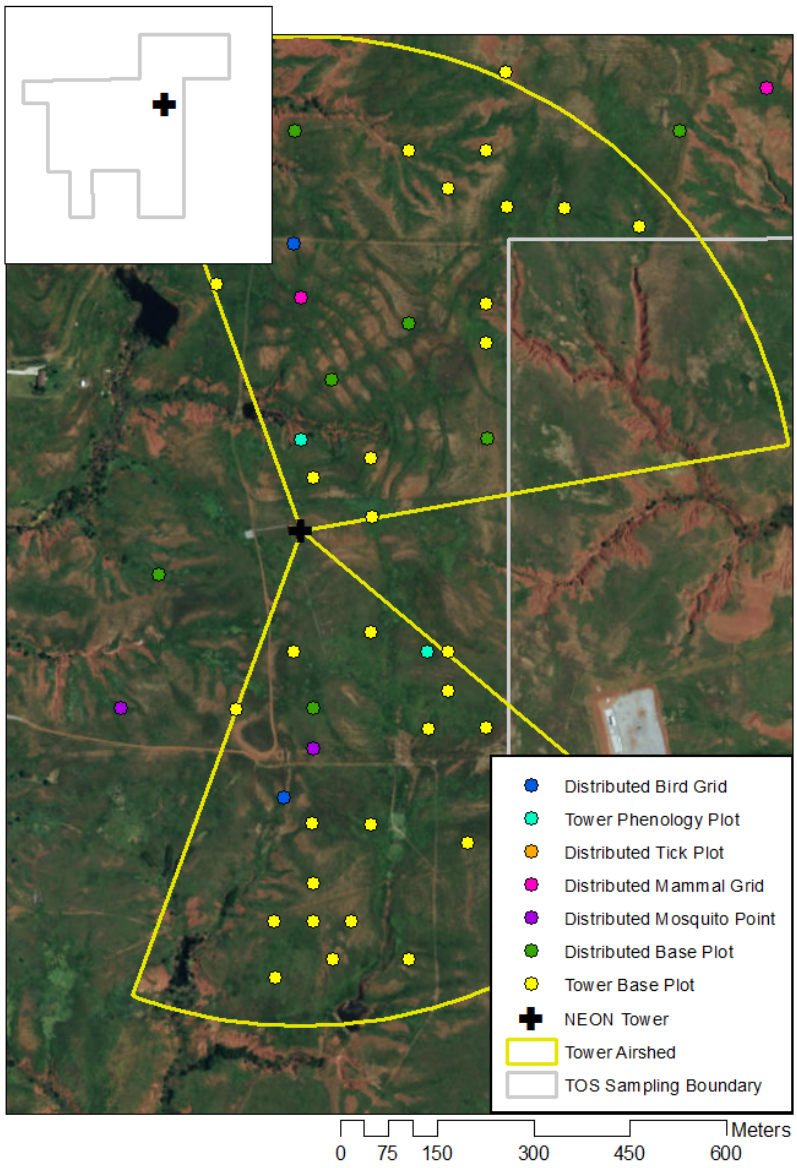

Figure 10: Map of the tower airshed and TOS plot centroids at OAES.

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

Table 12: NLCD land cover classes and area within the TOS site boundary at OAES.

NLCD Class	Site Area (km^2)	Percent (%)
Grassland Herbaceous	3.74	60.33
Shrub Scrub	1.81	29.2
Cultivated Crops	0.29	4.72
Developed Open Space	0.27	4.33
Mixed Forest	0.06	1
Open Water	0.02	0.29
Deciduous Forest	0.01	0.13

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 13: NLCD land cover classes and TOS plot numbers at OAES.

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Base Plot	Grassland Herbaceous	18
Distributed	Base Plot	Shrub Scrub	12
Distributed	Bird Grid	Grassland Herbaceous	7
Distributed	Mammal Grid	Grassland Herbaceous	4
Distributed	Mammal Grid	Shrub Scrub	2
Distributed	Mosquito Point	Grassland Herbaceous	7
Distributed	Mosquito Point	Shrub Scrub	3
Distributed	Tick Plot	Grassland Herbaceous	4
Distributed	Tick Plot	Shrub Scrub	2
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 types within the airshed include: shrub scrub and grassland herbaceous.

Table 14: Number of Distributed Base plots per NLCD land cover class per protocol at OAES.

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Grassland Herbaceous	Beetles	7
Distributed	Base Plot	Shrub Scrub	Beetles	3

Plot Type	Plot Subtype	NLCD Class	Protocols	Number of Plots
Distributed	Base Plot	Grassland Herbaceous	Canopy Foliage Chemistry	11
Distributed	Base Plot	Shrub Scrub	Canopy Foliage Chemistry	5
Distributed	Base Plot	Grassland Herbaceous	Coarse Downed Wood	13
Distributed	Base Plot	Shrub Scrub	Coarse Downed Wood	7
Distributed	Base Plot	Grassland Herbaceous	Digital Hemispherical Photos for Leaf Area Index	13
Distributed	Base Plot	Shrub Scrub	Digital Hemispherical Photos for Leaf Area Index	7
Distributed	Base Plot	Grassland Herbaceous	Herbaceous Biomass	13
Distributed	Base Plot	Shrub Scrub	Herbaceous Biomass	7
Distributed	Base Plot	Grassland Herbaceous	Plant Diversity	18
Distributed	Base Plot	Shrub Scrub	Plant Diversity	12
Distributed	Base Plot	Grassland Herbaceous	Soil Biogeochemistry	4
Distributed	Base Plot	Shrub Scrub	Soil Biogeochemistry	2
Distributed	Base Plot	Grassland Herbaceous	Soil Microbes	4
Distributed	Base Plot	Shrub Scrub	Soil Microbes	2
Distributed	Base Plot	Grassland Herbaceous	Vegetation Structure	13
Distributed	Base Plot	Shrub Scrub	Vegetation Structure	7

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 15: Number of Tower Plots per protocol at OAES.

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: OAES

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.

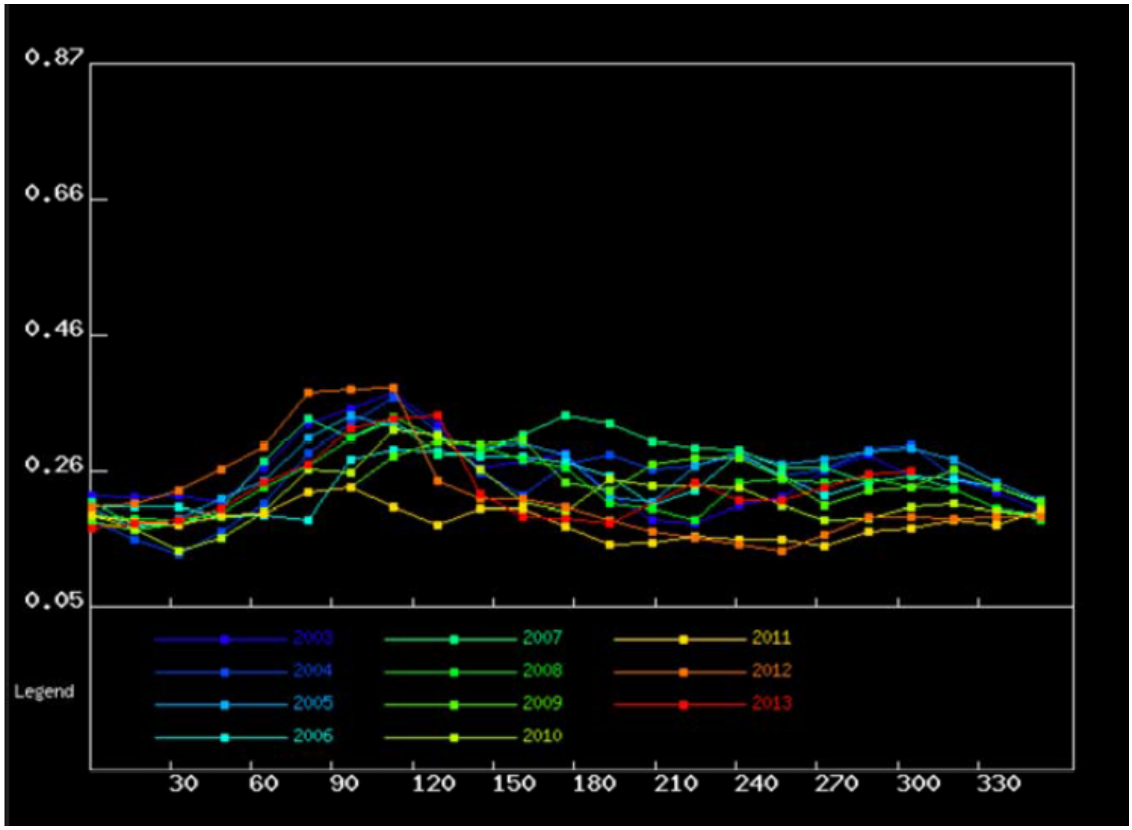

Figure 11: MODIS-EVI greenness (y-axis = EVI ratio) as a function of time (x-axis = DOY) for the years 2003-2013 at the NEON OAES site.

Table 16: Average MODIS-EVI greenness dates for the NEON OAES site, based on data from 2003-2013 (DOY, with MM/DD in parentheses).

Phenology Peak	Average Increase	Average Maximum	Average Decrease	Average Minimum
Peak 1	70 (03/11)	135 (05/15)	165 (06/14)	225 (08/13)
Peak 2	233 (08/11)	270 (09/27)	290 (10/17)	310 (11/06)

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 lat: 35.410715, centroid long: -99.058958

5.3 Belowground Biomass

5.3.1 Site-Specific Methods

Belowground biomass characterization data were collected down to a depth of 40 cm by NEON staff in February 2016. Field crews hit bedrock at 40cm and were not able to sample further. Since the NEON protocol for long-term, operational sampling of belowground biomass only collects data to a depth of 30 cm, the belowground biomass site characterization data are critical for scaling belowground biomass measurements to greater depths; see the TOS Science Design for Plant Biomass, Productivity, and Leaf Area Index (AD[7]) for more information. Samples were collected following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Roots were sorted to two diameter size categories ($\leq$ 2 mm and 2-30 mm) and by root status (live or dead). The tables below summarize all the belowground biomass less than or equal to 30 mm diameter; size class data and more information can be found by searching the NEON data portal for the data product numbers in Appendix A.

5.3.2 Results

Table 17: Soil Pit Information at OAES.

Latitude	Longitude	Soil Family	Soil Order
35.41062	-99.06044	Loamy - mixed - active - thermic Lithic Haplustepts	Inceptisol

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

Table 18: Fine root mass per depth increment (cm) at OAES.

Upper Depth	Lower Depth	Mean (mg per cm^3)	Std Dev
0	10	0.87	0.49
10	20	0.94	1.07
20	30	0.11	0.08
30	40	0.06	0.03

Table 19: Cumulative fine root mass as a function of depth (cm) at OAES.

Upper Depth	Lower Depth	Mean Cumulative (g per m^2)	Cumulative Std Dev
0	10	87.26	48.69
10	20	180.85	142.52
20	30	192.11	138.71
30	40	198.4	136.56

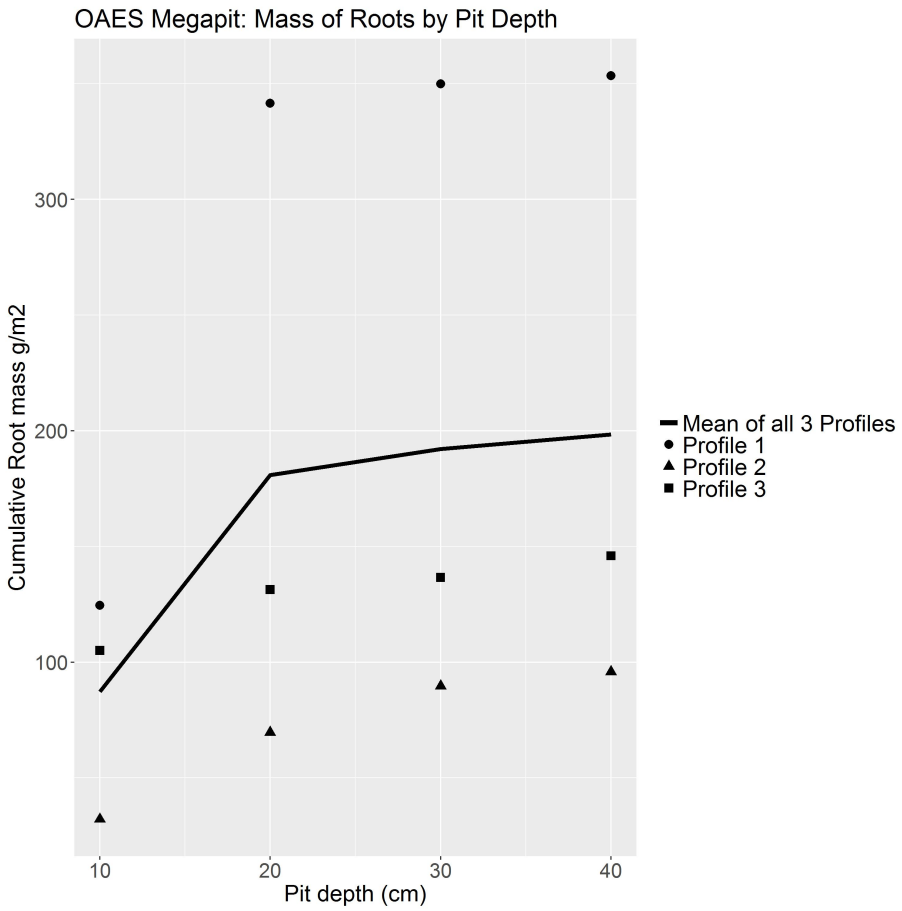

Figure 12: Cumulative root mass by pit depth at OAES.

Table 20: Fine root biomass sampling summary data at OAES.

Total Pit Depth (cm)	40
Total Mean Cumulative Mass at 30cm (g per m^2)	192.11
Total Mean Cumulative Mass at 100cm (g per m^2)	NA
Total Mean Cumulative Mass (g per m^2)	198.4

5.4 Plant Characterization and Phenology Species Selection

5.4.1 Site-Specific Methods

Plant characterization data were collected by NEON staff during May of 2015. 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 21: Site plant characterization and phenology species summary at OAES.

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
BODA2	*Bouteloua dactyloides* (Nutt.) J.T. Columbus	1	6	NA	NA
ANCA9	*Anemone caroliniana* Walter	102	<1	NA	NA
CASE12	*Calylophus serrulatus* (Nutt.) P.H. Raven	102	<1	NA	NA
EUMA8	*Euphorbia marginata* Pursh	102	<1	NA	NA
HYVE	*Hybanthus verticillatus* (Ortega) Baill.	102	<1	NA	NA
STELL	*Stellaria* sp.	102	<1	NA	NA
ZIGR	*Zinnia grandiflora* Nutt.	102	<1	NA	NA
CROTO	*Croton* sp.	108	<1	NA	NA
TRDU	*Tragopogon dubius* Scop.	109	<1	NA	NA
BOLA2	*Bothriochloa laguroides* (DC.) Herter	11	2	NA	NA
CONVO	*Convolvulus* sp.	110	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
DESO2	*Descurainia sophia* (L.) Webb ex Prantl	110	<1	NA	NA
PEGR7	*Penstemon grandiflorus* Nutt.	110	<1	NA	NA
SERI2	*Senecio riddellii* Torr. & A. Gray	110	<1	NA	NA
GASU	*Gaillardia suavis* (A. Gray & Engelm.) Britton & Rusby	114	<1	NA	NA
GLHE2	*Glechoma hederacea* L.	114	<1	NA	NA
SORO	*Solanum rostratum* Dunal	114	<1	NA	NA
SPCL	*Sporobolus clandestinus* (Biehler) Hitchc.	114	<1	NA	NA
CHENO	*Chenopodium* sp.	118	<1	NA	NA
ANGE	*Andropogon gerardii* Vitman	119	<1	NA	NA
GAPU	*Gaillardia pulchella* Foug.	119	<1	NA	NA
KRLA	*Krameria lanceolata* Torr.	119	<1	NA	NA
PACA6	*Panicum capillare* L.	119	<1	NA	NA
ARLU	*Artemisia ludoviciana* Nutt.	12	2	NA	NA
SALVI	*Salvia* sp.	125	<1	NA	NA
MONAR	*Monarda* sp.	126	<1	NA	NA
AMORP	*Amorpha* sp.	129	<1	NA	NA
DAAU	*Dalea aurea* Nutt. ex Pursh	129	<1	NA	NA
HYFI	*Hymenopappus filifolius* Hook.	129	<1	NA	NA
MAHE2	*Mammillaria heyderi* Muehlenpf.	129	<1	NA	NA
POAL4	*Polygala alba* Nutt.	129	<1	NA	NA
SOEL	*Solanum elaeagnifolium* Cav.	129	<1	NA	NA
TRFL2	*Tridens flavus* (L.) Hitchc.	13	2	NA	NA
AMDR	*Amphiachyris dracunculoides* (DC.) Nutt.	14	1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
PLVI	*Plantago virginica* L.	15	1	NA	NA
GUSA2	*Gutierrezia sarothrae* (Pursh) Britton & Rusby	16	1	NA	NA
GACO5	*Gaura coccinea* Nutt. ex Pursh	17	1	NA	NA
PSTE5	*Psoralidium tenuiflorum* (Pursh) Rydb.	18	1	NA	NA
CEAM2	*Centaurea americana* Nutt.	19	1	NA	NA
BOGR2	*Bouteloua gracilis* (Willd. ex Kunth) Lag. ex Griffiths	2	6	NA	NA
BASC5	*Bassia scoparia* (L.) A.J. Scott	20	1	NA	NA
ASNU4	*Astragalus nuttallianus* DC.	22	<1	NA	NA
LEAU3	*Lepidium austrinum* Small	23	<1	NA	NA
LIRI	*Linum rigidum* Pursh	23	<1	NA	NA
LIRI	*Linum rigidum* Pursh	23	<1	NA	NA
EVNU	*Evolvulus nuttallianus* Schult.	25	<1	NA	NA
TRRA5	*Tragia ramosa* Torr.	26	<1	NA	NA
THFI	*Thelesperma filifolium* (Hook.) A. Gray	27	<1	NA	NA
MEOF	*Melilotus officinalis* (L.) Lam.	28	<1	NA	NA
LIPR	*Linum pratense* (Norton) Small	29	<1	NA	NA
BOCU	*Bouteloua curtipendula* (Michx.) Torr.	3	5	NA	NA
PASM	*Pascopyrum smithii* (Rydb.) Á. Löve	30	<1	NA	NA
TELI3	*Tetraneuris linearifolia* (Hook.) Greene	31	<1	NA	NA
ERPI5	*Erioneuron pilosum* (Buckley) Nash	32	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
EULO2	*Euphorbia longicruris* Scheele	33	<1	NA	NA
ERCI6	*Erodium cicutarium* (L.) L'Hér. ex Aiton	34	<1	NA	NA
OEGR2	*Oenothera grandis* (Britton) Smyth	35	<1	NA	NA
HOPU	*Hordeum pusillum* Nutt.	36	<1	NA	NA
EVPR	*Evax prolifera* Nutt. ex DC.	37	<1	NA	NA
VUOC	*Vulpia octoflora* (Walter) Rydb.	38	<1	NA	NA
LEVI3	*Lepidium virginicum* L.	39	<1	NA	NA
ARPU9	*Aristida purpurea* Nutt.	4	5	NA	NA
PLPA2	*Plantago patagonica* Jacq.	40	<1	NA	NA
DAPU5	*Dalea purpurea* Vent.	42	<1	NA	NA
SCRE3	*Scutellaria resinosa* Torr.	43	<1	NA	NA
OPMA2	*Opuntia macrorhiza* Engelm.	44	<1	NA	NA
ARSE2	*Arenaria serpyllifolia* L.	45	<1	NA	NA
CRMO6	*Croton monanthogynus Michx* Croton monanthogynus Michx	46	<1	NA	NA
CIUN	*Cirsium undulatum* (Nutt.) Spreng.	47	<1	NA	NA
MAPIP4	*Machaeranthera pinnatifida* (Hook.) Shinners ssp. *pinnatifida* var. *pinnatifida*	48	<1	NA	NA
ALCA3	*Allium canadense* L.	49	<1	NA	NA
CAHAF	*Calylophus hartwegii* (Benth.) P.H. Raven ssp. *fendleri* (A. Gray) Towner & P.H. Raven	5	3	NA	NA
BRCA6	*Bromus catharticus* Vahl	50	<1	NA	NA
ERLO5	*Eriogonum longifolium* Nutt.	51	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
ASAS	*Asclepias asperula* (Decne.) Woodson	52	<1	NA	NA
GECA5	*Geranium carolinianum* L.	53	<1	NA	NA
GRSQ	*Grindelia squarrosa (Pursh)* Dunal	53	<1	NA	NA
DRRE2	*Draba reptans* (Lam.) Fernald	55	<1	NA	NA
CEBR3	*Cerastium brachypodum* (Engelm. ex A. Gray) B.L. Rob.	56	<1	NA	NA
GAVI	*Galium virgatum* Nutt.	57	<1	NA	NA
GLBI2	*Glandularia bipinnatifida* (Nutt.) Nutt.	58	<1	NA	NA
OXST	*Oxalis stricta L.* Oxalis stricta L.	58	<1	NA	NA
SPCOC2	*Sporobolus compositus* (Poir.) Merr.	6	3	NA	NA
PLAR3	*Plantago aristata* Michx.	60	<1	NA	NA
AECY	*Aegilops cylindrica* Host	61	<1	NA	NA
LESPE	*Lespedeza* sp.	62	<1	NA	NA
SIAN3	*Sisyrinchium angustifolium* Mill.	62	<1	NA	NA
ERIGE2	*Erigeron* sp.	64	<1	NA	NA
LIPU	*Liatris punctata* Hook.	65	<1	NA	NA
PONU4	*Polytaenia nuttallii* DC.	65	<1	NA	NA
SOLID	*Solidago* sp.	67	<1	NA	NA
GAPA6	*Gaura parviflora* Douglas ex Lehm.	68	<1	NA	NA
SPEC2	*Spermolepis echinata* (Nutt. ex DC.) A. Heller	69	<1	NA	NA
SCSC	*Schizachyrium scoparium* (Michx.) Nash	7	3	NA	NA
SPCR	*Sporobolus cryptandrus* (Torr.) A. Gray	70	<1	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
NOBI2	*Nothoscordum bivalve* (L.) Britton	71	<1	NA	NA
PYGR2	*Pyrrhopappus grandiflorus* (Nutt.) Nutt.	72	<1	NA	NA
RANUN	*Ranunculus* sp.	72	<1	NA	NA
MOCI	*Monarda citriodora* Cerv. ex Lag.	74	<1	NA	NA
PAVI4	*Paronychia virginica* Spreng.	75	<1	NA	NA
ASTRA	*Astragalus* sp.	76	<1	NA	NA
BOHI	*Bommeria hispida* (Mett. ex Kuhn) Underw.	77	<1	NA	NA
COGR5	*Coreopsis grandiflora* Hogg ex Sweet	77	<1	NA	NA
CUSCU	*Cuscuta* sp.	79	<1	NA	NA
OENOT	*Oenothera* sp.	79	<1	NA	NA
BRTE	*Bromus tectorum* L.	8	3	NA	NA
BOHI2	*Bouteloua hirsuta* Lag.	81	<1	NA	NA
YUGL	*Yucca glauca* Nutt.	81	<1	NA	NA
LOFO	*Lomatium foeniculaceum* (Nutt.) J.M. Coult. & Rose	83	<1	NA	NA
HELIA3	*Helianthus* sp.	84	<1	NA	NA
CHVE2	*Chloris verticillata* Nutt.	85	<1	NA	NA
PYCA2	*Pyrrhopappus carolinianus* (Walter) DC.	85	<1	NA	NA
CABEP2	*Calylophus berlandieri* Spach ssp. *pinifolius* (Engelm. ex A. Gray) Towner	87	<1	NA	NA
SONU2	*Sorghastrum nutans* (L.) Nash	87	<1	NA	NA
PLWR	*Plantago wrightiana* Decne.	89	<1	NA	NA
AMPS	*Ambrosia psilostachya* DC.	9	3	NA	NA

Taxon ID	Scientific Name	Rank	Mean Percent Cover	Mean Canopy Area (m^2 per m^2)	Mean ABH (cm^2 per m^2)
MINU6	*Mimosa nuttallii* (DC. ex Britton & Rose) B.L. Turner	90	<1	NA	NA
PHHE5	*Physalis heterophylla* Nees	91	<1	NA	NA
CYDA	*Cynodon dactylon* (L.) Pers.	92	<1	NA	NA
CAPUC	*Castilleja purpurea (Nutt.)* G. Don var. *citrina* (Pennell) Shinners	93	<1	NA	NA
LALU	*Lactuca ludoviciana* (Nutt.) Riddell	94	<1	NA	NA
PHMO9	*Physalis mollis* Nutt.	94	<1	NA	NA
SOHA	*Sorghum halepense* (L.) Pers.	94	<1	NA	NA
AGHY	*Agrostis hyemalis* (Walter) Britton, Sterns & Poggenb.	97	<1	NA	NA
ANBE	*Anemone berlandieri* Pritz.	98	<1	NA	NA
CRLI2	*Croton lindheimerianus* Scheele	98	<1	NA	NA
ERST3	*Erigeron strigosus* Muhl. ex Willd.	98	<1	NA	NA
OPHU	*Opuntia humifusa* (Raf.) Raf.	98	<1	NA	NA

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

Table 22: Per plot breakdown of species richness, diversity, and herbaceous cover at OAES.

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover	Bryophyte Percent Cover
OAES_042	61	3.53	128	0
OAES_043	47	3.15	113	0
OAES_044	59	2.69	200	0
OAES_045	33	2.6	112	0
OAES_046	38	2.84	178	0
OAES_047	40	2.57	95	0
OAES_048	49	2.93	225	0

Plot ID	Species Richness	Shannon Diversity Index	Percent Total Herbaceous Cover	Bryophyte Percent Cover
OAES_049	44	2.87	164	0
OAES_050	46	2.98	120	0
OAES_051	37	2.92	172	0
OAES_052	51	3.24	114	0
OAES_053	50	2.81	256	0
OAES_054	55	3.09	255	0
OAES_055	44	3.13	216	0
OAES_056	38	2.35	173	0
OAES_057	45	2.77	186	0
OAES_058	37	2.69	132	0
OAES_059	47	3	141	0
OAES_060	45	2.9	148	0.12
OAES_061	35	2.62	229	0
OAES_062	32	2.25	92	0
OAES_063	56	3.15	188	0
OAES_064	46	2.75	232	0
OAES_065	43	2.8	162	0
OAES_066	44	2.98	137	0
OAES_067	40	2.93	113	0
OAES_068	38	2.83	108	0
OAES_069	38	3.05	67	0
OAES_070	43	2.97	160	0
OAES_071	41	2.74	147	0
Bryophyte Mean				0

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.

5.5 Beetles

5.5.1 Site-Specific Methods

Beetle site characterization was conducted in the summer of 2014 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. All samples were pooled before identification. For more information on this protocol and data product numbers see Appendix A.

5.5.2 Results

Table 23: Beetle identification results at OAES.

Sample ID	Scientific Name	Sex
NEON8507	*Poecilus chalcites*	f
NEON8508	*Pasimachus californicus*	f
NEON8509	*Pasimachus californicus*	m
NEON8510	*Pasimachus californicus*	m
NEON8511	*Pasimachus californicus*	m
NEON8512	*Pasimachus californicus*	f
NEON8513	*Pasimachus californicus*	m
NEON8514	*Pasimachus californicus*	m
NEON8515	*Pasimachus californicus*	f
NEON8516	*Pasimachus californicus*	f
NEON8517	*Pasimachus californicus*	m
NEON8518	*Pasimachus californicus*	f
NEON8519	*Pasimachus californicus*	m
NEON8520	*Pasimachus californicus*	m
NEON8521	*Pasimachus californicus*	f
NEON8522	*Pasimachus californicus*	m
NEON8523	*Pasimachus californicus*	f
NEON8524	*Pasimachus elongatus*	m
NEON8525	*Pasimachus californicus*	m
NEON8526	*Pasimachus californicus*	f
NEON8527	*Pasimachus californicus*	f
NEON8528	*Pasimachus californicus*	f
NEON8529	*Pasimachus californicus*	m

Sample ID	Scientific Name	Sex
NEON8530	*Pasimachus californicus*	m
NEON8531	*Pasimachus californicus*	f
NEON8532	*Pasimachus californicus*	f
NEON8533	*Pasimachus californicus*	m
NEON8534	*Pasimachus californicus*	m
NEON8535	*Pasimachus californicus*	m
NEON8536	*Pasimachus californicus*	u
NEON8537	*Pasimachus californicus*	m
NEON8538	*Pasimachus californicus*	f
NEON8539	*Pasimachus californicus*	m
NEON8540	*Pasimachus californicus*	m
NEON8541	*Pasimachus californicus*	u
NEON8542	*Pasimachus californicus*	m
NEON8543	*Pasimachus californicus*	m
NEON8544	*Pasimachus californicus*	m
NEON8545	*Pasimachus californicus*	f
NEON8546	*Pasimachus californicus*	m
NEON8547	*Pasimachus californicus*	m
NEON8548	*Pasimachus californicus*	f
NEON8549	*Pasimachus californicus*	m
NEON8550	*Pasimachus californicus*	m
NEON8551	*Pasimachus californicus*	u
NEON8552	*Pasimachus californicus*	f
NEON8553	*Pasimachus californicus*	m
NEON8554	*Pasimachus californicus*	f
NEON8555	*Pasimachus californicus*	m
NEON8556	*Pasimachus californicus*	m
NEON8557	*Pasimachus californicus*	m
NEON8558	*Pasimachus californicus*	m
NEON8559	*Pasimachus californicus*	u
NEON8560	*Pasimachus californicus*	m
NEON8561	*Pasimachus californicus*	m
NEON8562	*Pasimachus californicus*	f
NEON8563	*Pasimachus californicus*	m

Sample ID	Scientific Name	Sex
NEON8564	*Pasimachus californicus*	f
NEON8565	*Pasimachus californicus*	f
NEON8566	*Pasimachus californicus*	u
NEON8567	*Pasimachus californicus*	m
NEON8568	*Pasimachus californicus*	f
NEON8569	*Pasimachus elongatus*	f
NEON8570	*Pasimachus elongatus*	u
NEON8571	*Pasimachus elongatus*	f
NEON8572	*Harpalus (Megapangus) katiae*	m
NEON8573	*Chlaenius tomentosus*	f
NEON8574	*Chlaenius tomentosus*	m
NEON8575	*Chlaenius tomentosus*	f
NEON8582	*Dromochorus belfragei*	f
NEON8583	*Cicindela punctulata*	f
NEON8584	*Dromochorus belfragei*	m
NEON8585	*Anisodactylus rusticus*	m
NEON8586	*Cyclotrachelus substriatus*	f
NEON8587	*Cratacanthus dubius*	u

5.6 Mosquitoes

5.6.1 Site-Specific Methods

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

5.6.2 Results

Table 24: Mosquito identification results at OAES.

Sample ID	Scientific Name	Sex	Count
OAES.2014.1	*Culex tarsalis*	Female	19
OAES.2014.1	*Psorophora cyanescens*	Female	11
OAES.2014.1	*Aedes canadensis*	Female	1

Sample ID	Scientific Name	Sex	Count
OAES.2014.1	*Aedes sollicitans*	Female	5
OAES.2014.1	*Aedes atropalpus*	Female	6
OAES.2014.1	*Aedes vexans*	Female	27
OAES.2014.1	*Aedes vexans*	Male	7
OAES.2014.1	*Psorophora columbiae*	Female	32
OAES.2014.1	*Culex erraticus*	Female	1

5.7 Ticks

5.7.1 Site-Specific Methods

Tick drags were conducted at OAES in the summer of 2014 to test protocol methods and calculate capture rates. No ticks were caught during site characterization. For more information on this protocol and data product numbers see Appendix A.

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[07], RD[08]).

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

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

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

Fuhlendorf, Samuel D., Hailin Zhang, Tim. R. Tunnell, David M. Engle, and Anne Fernald Cross. 2002. "Effects of Grazing on Restoration of Southern Mixed Prairie Soils." Restoration Ecology 10 (2):401-407. https://doi.org/10.1046/j.1526-100X.2002.00013.x.

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McGranahan, D.A., Engle, D.M., Fuhlendorf, S.D., Winter, S.J., Miller, J.R. and Debinski, D.M., 2012. Spatial heterogeneity across five rangelands managed with pyric-herbivory. Journal of Applied Ecology, 49(4), pp.903-910.

The Nature Conservancy. 2013. "Checklist of Oklahoma Preserve Reptile & Amphibian Species - Four Canyon Preserve." http://www.oklanature.com/jfisher/tnc-ok_herp_list.pdf.

6 REFERENCES

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

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

7 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 25: 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

Name	Description	Identification Code
Plant presence and percent cover	Plant species presence as observed in multi-scale plots: species and associated percent cover at 1-m2 and plant species presence at 10-m2, 100-m2 and 400-m2	NEON.DOM.SITE.DP1.10058
Plant phenology observations	Phenophase status and intensity of tagged plants	NEON.DOM.SITE.DP1.10055
Plant foliar stable isotopes	Field collection metadata describing the sampling of sun-lit canopy foliar tissues for stable isotope compositions. Also includes raw data returned from the laboratory.	NEON.DOM.SITE.DP1.10053
Plant foliar physical and chemical properties	Plant sun-lit canopy foliar physical (e.g., leaf mass per area) and chemical properties reported at the level of the individual.	NEON.DOM.SITE.DP1.10026
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