TOS SITE CHARACTERIZATION REPORT: DOMAIN 01

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Change Record

REVISION	DATE	ECO #	DESCRIPTION OF CHANGE
A	10/21/2016	ECO-04186	Initial Release

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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 two sites in the Northeast 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.004316	Operations Field Safety and Security Plan
AD[03]	NEON.DOC.050005	Field Operations Job Instruction Training Plan
AD[04]	NEON.DOC.000909	TOS Science Design for Ground Beetle Abundance and Diversity
AD[05]	NEON.DOC.000910	TOS Science Design for Mosquito Abundance, Diversity and Phenology
AD[06]	NEON.DOC. 000912	TOS Science Design for Plant Diversity
AD[07]	NEON.DOC.000915	TOS Science Design for Small Mammal Abundance and Diversity
AD[08]	NEON.DOC.000914	TOS Science Design for Plant Biomass, Productivity, and Leaf Area Index

AD[09]	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.011027	TIS Site Characterization Report
RD[05]	NEON.DOC.001588	AOS Site Characterization Report
RD[06]	NEON.DOC.003885	TOS Site Characterization Methods

2.3 Acronyms

Acronym	Definition
NLCD	National Land Cover Database

3 DOMAIN 01 OVERVIEW: THE NORTHEAST

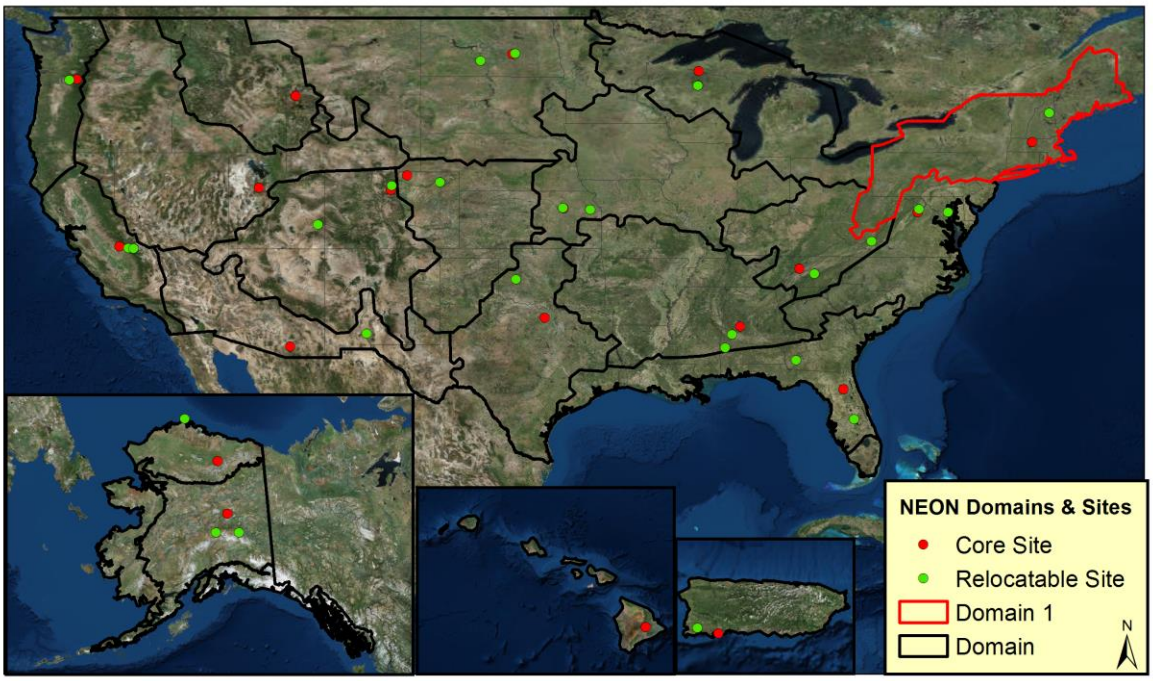

Figure 1. NEON project map with Domain 01 highlighted in red.

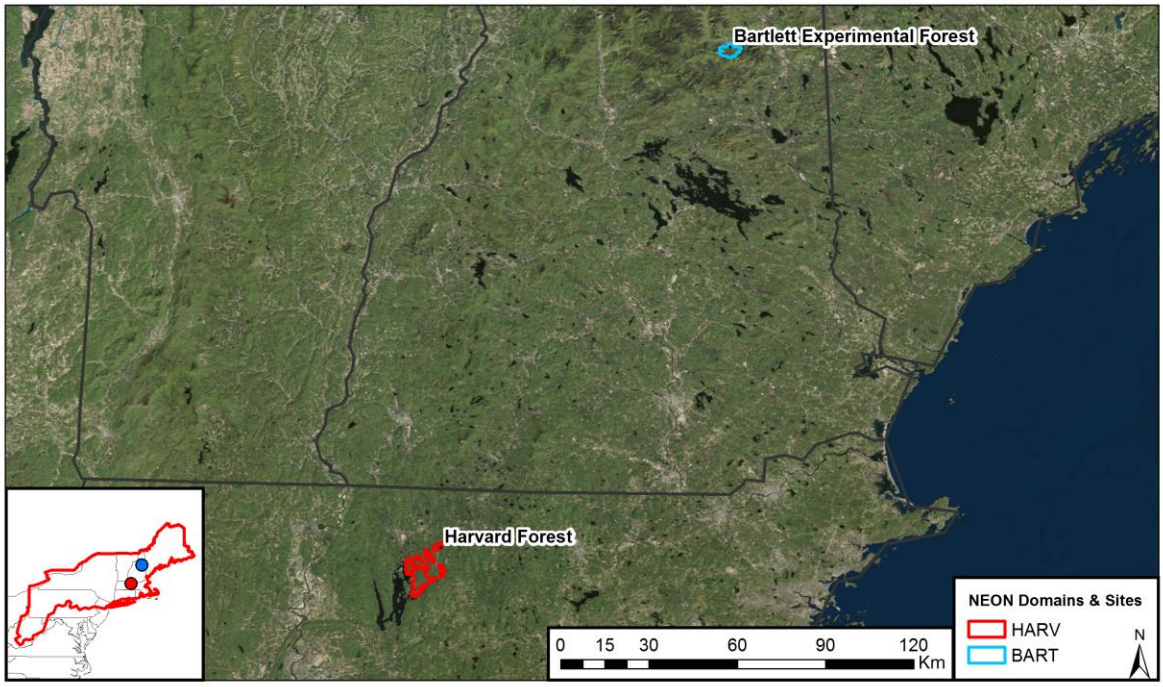

Figure 2. Site boundaries within Domain 01.

- States in the domain: Connecticut, Maine, Massachusetts, New Jersey, New Hampshire, New York, Ohio, Rhode Island, Vermont, Virginia, West Virginia
- Core site: Harvard Forest (HARV)
- Relocatable 1: Bartlett Experimental Forest (BART)
- Science theme: Climate Change

4 CORE SITE: HARVARD FOREST

The NEON Harvard Forest site includes land managed by two distinct entities: the Harvard Forest managed by Harvard University and the Harvard Forest Long Term Ecological Research (LTER) program (15.2 km^2) and the Quabbin Reservoir Watershed managed by the Massachusetts Department of Conservation and Recreation (33.8 km^2). Representative habitats at the NEON site include northern, transition, and central forests; marshes, swamps, conifer-dominated bogs, and forest plantations.

Regionally, HARV represents a typical rural/ wildland, allowing NEON to scale to larger spheres of influence, and the site anchors an urban to rural gradient from suburban areas outside Boston to the wildlands throughout New England, Maine and New Hampshire. Harvard Forest is centrally located relative to major Northeastern biotic and environmental gradients in the Transition Forest Zone, a floristic tension zone formed by the range limits of northern and southern taxa that is sensitive to future climate change.

Key Characteristics:

- Site hosts:
  - Harvard Forest -Harvard University, LTER
  - Quabbin Reservoir Watershed - Department of Conservation and Recreation- Division of Water Supply Protection
- Worcester County, Massachusetts
- Area: 49.025km^2
- Elevation: 160- 382m
- Dominant vegetation type: The vegetation is typical of the Transition Hardwoods-White Pine-Hemlock region. The dominant vegetation is regenerating Eastern Deciduous temperate forest. Harvard Forest lies at the current northern range limit of the hemlock woolly adelgid (*Adelges tsugae*), an aphid-like insect that is killing eastern hemlock (*Tsuga canadensis*) across its range.

- General management: Since its inception in 1907, research and education have been the focus of Harvard Forest. The original purpose was to develop a field laboratory for students, a research center in forestry and related disciplines, and a demonstration of practical sustained forestry. Since 1988, Harvard Forest has been a Long-Term Ecological Research site, funded by the National Science Foundation to conduct integrated, long-term studies of forest dynamics.
- Plot Selection: NEON TOS Plots were allocated across the site following NEON standard criteria and avoiding existing research.

4.1 TOS Spatial Sampling Design

TOS plots were allocated at HARV 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 plots that are distributed throughout the site according to the spatial design are hereafter referred to as 'Distributed Plots'. TOS plots that are randomly allocated within the airshed of the NEON Terrestrial Instrument System (TIS) tower to collect complementary data are not stratified by NLCD class; these plots are hereafter referred to as 'Tower Plots'. The maps below depict the plot locations for the first year of NEON sampling. Some plot locations may change over time due to logistics, safety, and science requirements. Please visit the NEON website (http://www.neonscience.org) for updated plot locations at each site.

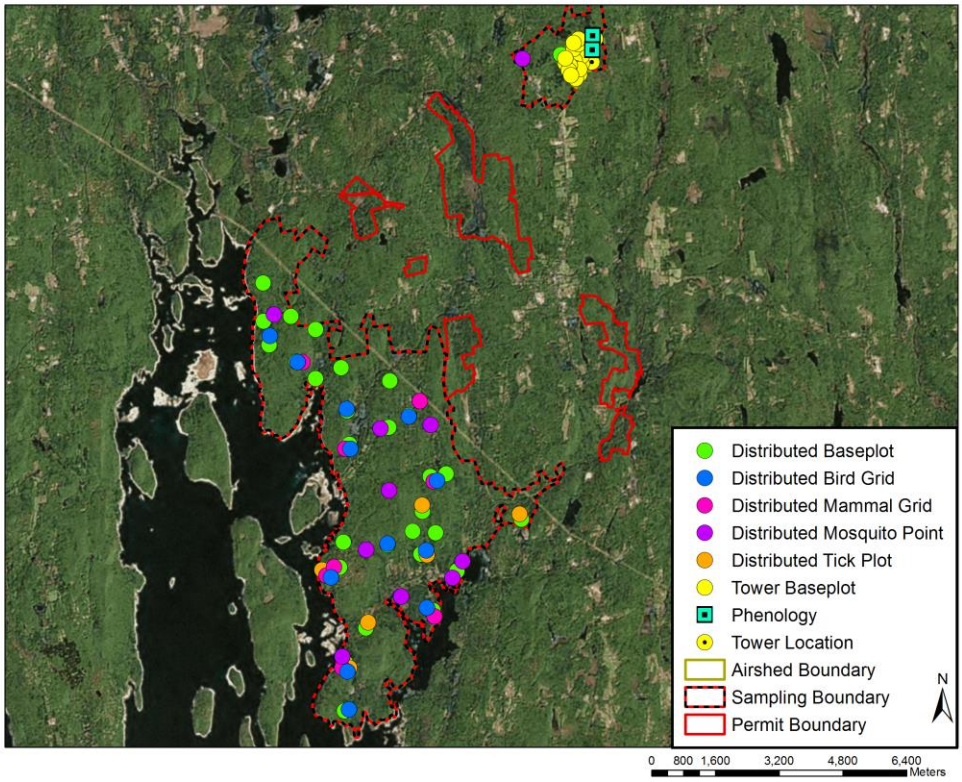

Figure 3. Map of TOS plot locations within the NEON TOS sampling boundary at HARV.

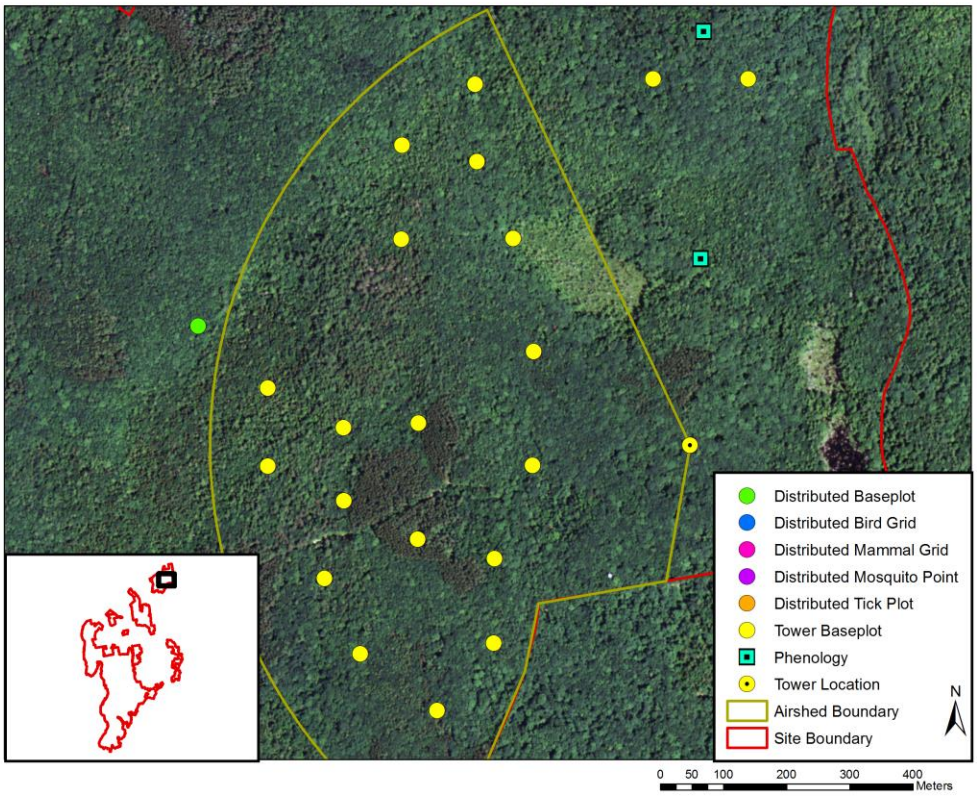

Figure 4. Map of the airshed area at HARV.

More information about the tower airshed can be found in the FIU site characterization reports (RD[4]).

Table 1. NLCD Land Cover Classes and Area within the TOS site boundary at HARV.

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

NLCD Class	Site Area (km^2)	Percent (%)
Deciduous Forest	16.16	42.77%
Evergreen Forest	11.12	29.42%
Mixed Forest	7.12	18.84%

NLCD Class	Site Area (km^2)	Percent (%)
Developed, Open Space	1.40	3.70%
Shrub/Scrub	0.55	1.45%
Open Water	0.47	1.25%
Emergent Herbaceous Wetlands	0.36	0.96%
Pasture/Hay	0.28	0.73%
Woody Wetlands	0.22	0.59%
Developed, Low Intensity	0.05	0.12%
Grassland/Herbaceous	0.04	0.11%
Cultivated Crops	0.01	0.03%
Developed, Medium Intensity	0.004	0.01%
Barren Land (Rock/Sand/Clay)	0.005	0.01%
Open Water	0.47	1.25%
Developed, Open Space	1.40	3.70%
Developed, Low Intensity	0.05	0.12%
Developed, Medium Intensity	0.004	0.01%
Barren Land (Rock/Sand/Clay)	0.005	0.01%
Deciduous Forest	16.16	42.77%
Evergreen Forest	11.12	29.42%
Mixed Forest	7.12	18.84%
Shrub/Scrub	0.55	1.45%
Grassland/Herbaceous	0.04	0.11%

NLCD Class	Site Area (km^2)	Percent (%)
Pasture/Hay	0.28	0.73%
Cultivated Crops	0.01	0.03%
Woody Wetlands	0.22	0.59%
Emergent Herbaceous Wetlands	0.36	0.96%

Table 2. NLCD Land Cover Classes and TOS plot numbers at HARV.

Note: NLCD land cover classes as not used to stratify tower plots

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Base	Deciduous Forest	10
Distributed	Base	Evergreen Forest	9
Distributed	Base	Mixed Forest	7
Distributed	Base	Woody Wetland	4
Distributed	Bird	Deciduous Forest	4
Distributed	Bird	Evergreen Forest	3
Distributed	Bird	Mixed Forest	3
Distributed	Bird	Woody Wetland	2
Distributed	Mammal	Deciduous Forest	3
Distributed	Mammal	Evergreen Forest	3
Distributed	Mammal	Mixed Forest	2
Distributed	Mammal	Woody Wetland	0
Distributed	Mosquito	Deciduous Forest	4
Distributed	Mosquito	Evergreen Forest	3

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Mosquito	Mixed Forest	2
Distributed	Mosquito	Woody Wetland	1
Distributed	Tick	Deciduous Forest	2
Distributed	Tick	Evergreen Forest	2
Distributed	Tick	Mixed Forest	1
Distributed	Tick	Woody Wetland	1
Tower	Phenology	NA	2
Tower	Tower Plot	NA	20

Table 3. Number of Distributed Base Plots per NLCD Land Cover Class per protocol at HARV.

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

Plot Type	Plot Subtype	Protocols	NLCD Class	Number of Plots
Distributed	Base Plot	Beetles	Deciduous Forest	4
Distributed	Base Plot	Beetles	Evergreen Forest	3
Distributed	Base Plot	Beetles	Mixed Forest	3
Distributed	Base Plot	Biogeochemistry	Deciduous Forest	2
Distributed	Base Plot	Biogeochemistry	Evergreen Forest	1
Distributed	Base Plot	Biogeochemistry	Mixed Forest	2
Distributed	Base Plot	Biogeochemistry	Woody Wetlands	1
Distributed	Base Plot	Canopy Foliage Chemistry	Deciduous Forest	2

Plot Type	Plot Subtype	Protocols	NLCD Class	Number of Plots
Distributed	Base Plot	Canopy Foliage Chemistry	Evergreen Forest	1
Distributed	Base Plot	Canopy Foliage Chemistry	Mixed Forest	2
Distributed	Base Plot	Canopy Foliage Chemistry	Woody Wetlands	1
Distributed	Base Plot	Coarse Downed Debris	Deciduous Forest	7
Distributed	Base Plot	Coarse Downed Debris	Evergreen Forest	6
Distributed	Base Plot	Coarse Downed Debris	Mixed Forest	4
Distributed	Base Plot	Coarse Downed Debris	Woody Wetlands	3
Distributed	Base Plot	Digital Hemispherical Photos for Leaf Area Index	Deciduous Forest	7
Distributed	Base Plot	Digital Hemispherical Photos for Leaf Area Index	Evergreen Forest	6
Distributed	Base Plot	Digital Hemispherical Photos for Leaf Area Index	Mixed Forest	4
Distributed	Base Plot	Digital Hemispherical Photos for Leaf Area Index	Woody Wetlands	3
Distributed	Base Plot	Herbaceous Productivity	Deciduous Forest	7
Distributed	Base Plot	Herbaceous Productivity	Evergreen Forest	6
Distributed	Base Plot	Herbaceous Productivity	Mixed Forest	4
Distributed	Base Plot	Herbaceous Productivity	Woody Wetlands	3
Distributed	Base Plot	Plant Diversity	Deciduous Forest	10
Distributed	Base Plot	Plant Diversity	Evergreen Forest	9
Distributed	Base Plot	Plant Diversity	Mixed Forest	7
Distributed	Base Plot	Plant Diversity	Woody Wetlands	4

Plot Type	Plot Subtype	Protocols	NLCD Class	Number of Plots
Distributed	Base Plot	Soil Microbes	Deciduous Forest	2
Distributed	Base Plot	Soil Microbes	Evergreen Forest	1
Distributed	Base Plot	Soil Microbes	Mixed Forest	2
Distributed	Base Plot	Soil Microbes	Woody Wetlands	1
Distributed	Base Plot	Vegetation Structure	Deciduous Forest	7
Distributed	Base Plot	Vegetation Structure	Evergreen Forest	6
Distributed	Base Plot	Vegetation Structure	Mixed Forest	4
Distributed	Base Plot	Vegetation Structure	Woody Wetlands	3

Table 4. Number of Tower Base Plots per protocol at HARV.

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

Plot Type	Plot Subtype	Protocols	Number of Plots
Tower	Base Plot	Below Ground Biomass Coring	20
Tower	Base Plot	Biogeochemistry	4
Tower	Base Plot	Canopy Foliage Chemistry	4
Tower	Base Plot	Coarse Downed Debris	20
Tower	Base Plot	Digital Hemispherical Photos for Leaf Area Index	20
Tower	Base Plot	Herbaceous Productivity	20
Tower	Base Plot	Litterfall and Fine Woody Debris	20
Tower	Base Plot	Mat-Forming Bryophyte Production	20

Plot Type	Plot Subtype	Protocols	Number of Plots
Tower	Base Plot	Plant Diversity	3
Tower	Base Plot	Soil Microbes	4
Tower	Base Plot	Vegetation Structure	20

4.2 Belowground Biomass

4.2.1 Site-Specific Methods

Belowground biomass characterization data were collected down to a depth of 130 cm by NEON staff in July 2012 following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Since the NEON protocol for long-term, operational sampling of belowground biomass only collects data to a depth of 30cm, 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 (RD[8]) for more information. The tables below summarize the belowground biomass site characterization work and more data and information can be found by searching the data product numbers in Appendix A.

4.2.2 Results

Table 5. HARV fine root mass per depth increment (mg/cm^3)

Upper Depth	Lower Depth	Mean mg/cm^3	mg/cm^3 std dev
0	10	6.74	1.87
10	20	3.65	0.85
20	30	1.85	0.48
30	40	2.23	1.58
40	50	2.94	3.92
50	60	0.39	0.45

Upper Depth	Lower Depth	Mean mg/cm^3	mg/cm^3 std dev
60	70	0.41	0.36
70	80	0.10	0.09
80	90	0.01	0.01
90	100	0.00	0.00
100	110	0.00	0.00
110	120	0.06	0.11
120	130	0.19	0.32

Table 6. HARV cumulative fine root mass as a function of depth (g/m^2)

Upper Depth	Lower Depth	Mean Cumulative g/m^2	Cumulative g/m^2 std dev
0	10	673.68	187.16
10	20	1038.85	212.00
20	30	1224.14	181.26
30	40	1446.93	146.40
40	50	1740.82	441.08
50	60	1779.89	451.61
60	70	1820.45	484.30
70	80	1830.45	493.57
80	90	1831.22	493.55
90	100	1831.22	493.55
100	110	1831.22	493.55

Upper Depth	Lower Depth	Mean Cumulative g/m^2	Cumulative g/m^2 std dev
110	120	1837.45	493.53
120	130	1856.02	494.85

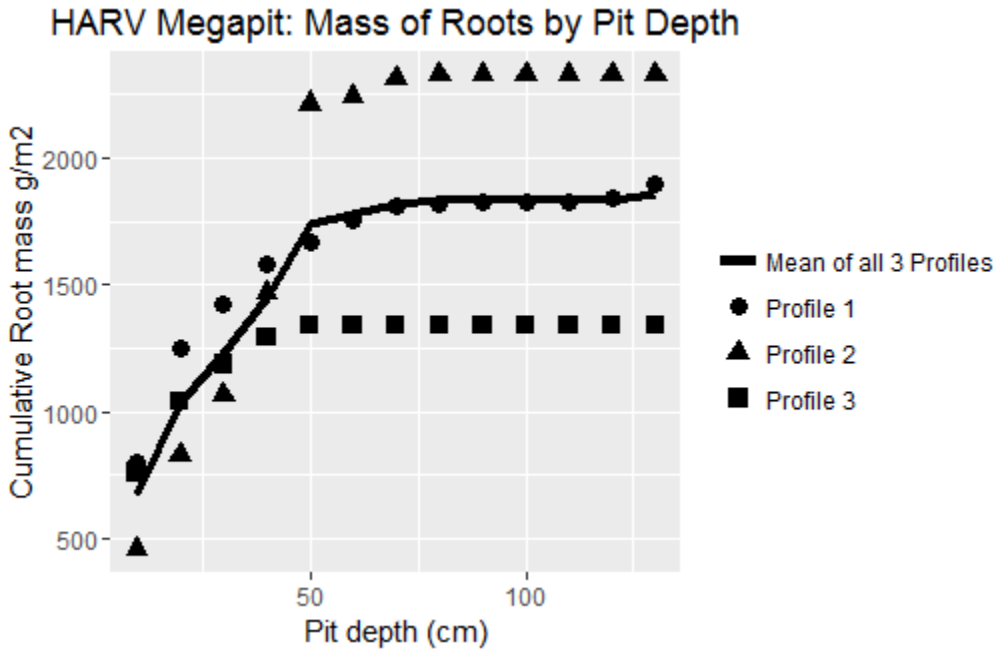

Figure 5. HARV Cumulative Root Mass by Pit Depth

Table 7. HARV fine root biomass sampling summary data

Total Pit Depth	130 cm
Total Cumulative Mass at 30cm (g/m^2)	1224.14
Total Cumulative Mass at 100cm (g/m^2)	1831.22
Total Cumulative Mass (g/m^2)	1856.02

4.3 Plant Characterization and Phenology Species Selection

4.3.1 Site-Specific Methods

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

4.3.2 Results

Table 8. Site Plant Characterization and Phenology Species Summary at HARV.

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

Taxon ID	Scientific Name	Rank	Mean % Cover	Mean Canopy Area per m^2	Mean ABH cm^2 per m^2
OSCI	*Osmunda cinnamomea* L.	1	6	N/A	N/A
QURU	*Quercus rubra* L.	2	N/A	N/A	10.88
TSCA	*Tsuga canadensis* (L.)	3	<1	N/A	7.59
ACRU	*Acer rubrum* L.	4	<1	N/A	6.67
DEPU2	*Dennstaedtia punctilobula (Michx.)* T. Moore	5	2	N/A	N/A
PIST	*Pinus strobus* L.	6	<1	N/A	3.32
PIRE	*Pinus resinosa* Aiton	7	N/A	N/A	3.41
ARNU2	*Aralia nudicaulis* L.	8	1	N/A	N/A
MACA4	*Maianthemum canadense* Desf.	9	1	N/A	N/A
MEVI	*Medeola virginiana* L.	10	1	N/A	N/A
VAAN	*Vaccinium angustifolium* Aiton	11	1	N/A	N/A
PIMA	*Picea mariana* (Mill.) Britton,	12	N/A	N/A	1.97

Taxon ID	Scientific Name	Rank	Mean % Cover	Mean Canopy Area per m^2	Mean ABH cm^2 per m^2
	Sterns & Poggenb.				
MIRE	*Mitchella repens* L.	13	<1	N/A	N/A
GAPR2	*Gaultheria procumbens* L.	14	<1	N/A	N/A
KALA	*Kalmia latifolia* L.	15	<1	N/A	0
UVSE	*Uvularia sessilifolia* L.	16	<1	N/A	N/A
TRBO2	*Trientalis borealis* Raf.	17	<1	N/A	N/A
COTR2	*Coptis trifolia* (L.) Salisb.	18	<1	N/A	N/A
THNO	*Thelypteris noveboracensis* (L.) Nieuwl.	19	<1	N/A	N/A
BEAL2	*Betula alleghaniensis* Britton	20	N/A	N/A	0.85
QUVE	*Quercus velutina* Lam.	21	N/A	N/A	0.68
FAGR	*Fagus grandifolia* Ehrh.	22	<1	N/A	0.51
BELE	*Betula lenta* L.	23	<1	N/A	0.53
DRCA11	*Dryopteris carthusiana* (Vill.) H.P. Fuchs	24	<1	N/A	N/A
NYSY	*Nyssa sylvatica* Marshall	25	N/A	N/A	0.54
CLBO3	*Clintonia borealis* (Aiton) Raf.	26	<1	N/A	N/A
VACO	*Vaccinium corymbosum* L.	27	<1	N/A	0
PIAB	*Picea abies* (L.) Karst.	28	N/A	N/A	0.41
LYOB	*Lycopodium obscurum* L.	29	<1	N/A	N/A
ACPE	*Acer pensylvanicum* L.	30	<1	N/A	0.01

Taxon ID	Scientific Name	Rank	Mean % Cover	Mean Canopy Area per m^2	Mean ABH cm^2 per m^2
BEPA	*Betula papyrifera* Marshall	31	N/A	N/A	0.29
VILA11	*Viburnum lantanoides* Michx.	32	<1	N/A	0
DRCA3	*Dryopteris campyloptera* Clarkson	33	<1	N/A	N/A
QUERC	*Quercus* sp.	34	<1	N/A	N/A
VINUC	*Viburnum nudum L. var. cassinoides* (L.) Torr. & A. Gray	35	<1	N/A	N/A
FRAM2	*Fraxinus americana* L.	36	N/A	N/A	0.16
RHPR	*Rhododendron prinophyllum* (Small) Millais	37	<1	N/A	N/A
EPRE2	*Epigaea repens* L.	38	<1	N/A	N/A
PTAQ	*Pteridium aquilinum* (L.) Kuhn	38	<1	N/A	N/A
PRSE2	*Prunus serotina* Ehrh.	40	<1	N/A	0.01
ILVE	*Ilex verticillata* (L.) A. Gray	41	<1	N/A	0
ARTR	*Arisaema triphyllum* (L.) Schott	42	<1	N/A	N/A
BEPO	*Betula populifolia* Marshall	42	<1	N/A	N/A
LIBE3	*Lindera benzoin* (L.) Blume	42	<1	N/A	N/A
AMELA	*Amelanchier* sp.	45	<1	N/A	N/A
ILLA	*Ilex laevigata* (Pursh) A. Gray	45	<1	N/A	N/A
VIDE	*Viburnum dentatum* L.	45	<1	N/A	N/A
QUAL	*Quercus alba* L.	48	N/A	N/A	0.06
DRCR4	*Dryopteris cristata* (L.) A. Gray	49	<1	N/A	N/A

Taxon ID	Scientific Name	Rank	Mean % Cover	Mean Canopy Area per m^2	Mean ABH cm^2 per m^2
LYAN2	*Lycopodium annotinum* L.	49	<1	N/A	N/A
THPA	*Thelypteris palustris* Schott	49	<1	N/A	N/A
CELAS	*Celastrus* sp.	52	<1	N/A	N/A
DRMA4	*Dryopteris marginalis* (L.) A. Gray	52	<1	N/A	N/A
MOUN3	*Monotropa uniflora* L.	52	<1	N/A	N/A
TRUN	*Trillium undulatum* Willd.	52	<1	N/A	N/A
PIGL	*Picea glauca* (Moench) Voss	56	N/A	N/A	0.03
POGR4	*Populus grandidentata* Michx.	57	N/A	N/A	0.03
LADE2	*Larix decidua* Mill.	58	N/A	N/A	0.03
LYTR	*Lycopodium tristachyum* Pursh	59	<1	N/A	N/A
OCAC	*Oclemena acuminata* (Michx.) Greene	59	<1	N/A	N/A
RUHI	*Rubus hispidus* L.	59	<1	N/A	N/A
ACSA3	*Acer saccharum* Marshall	62	N/A	N/A	0.02
BETUL	*Betula* sp.	63	<1	N/A	N/A
CADE5	*Carex debilis* Michx.	63	<1	N/A	N/A
CAREX	*Carex* sp.	63	<1	N/A	N/A
CASW	*Carex swanii* (Fernald) Mack.	63	<1	N/A	N/A
CATR10	*Carex trisperma* Dewey	63	<1	N/A	N/A
COCA13	*Cornus canadensis* L.	63	<1	N/A	N/A

Taxon ID	Scientific Name	Rank	Mean % Cover	Mean Canopy Area per m^2	Mean ABH cm^2 per m^2
EUDI16	*Eurybia divaricata* (L.) G.L. Nesom	63	<1	N/A	N/A
PRAV	*Prunus avium* (L.) L.	63	<1	N/A	N/A
RUPU	*Rubus pubescens* Raf.	63	<1	N/A	N/A
SPAL2	*Spiraea alba* Du Roi	63	<1	N/A	N/A
TRER3	*Trillium erectum* L.	63	<1	N/A	N/A
CADE12	*Castanea dentata* (Marshall) Borkh.	74	N/A	N/A	0.01
HAVI4	*Hamamelis virginiana* L.	75	N/A	N/A	0.01
OSVI	*Ostrya virginiana* (Mill.) K. Koch	76	N/A	N/A	0.01
VINU	*Viburnum nudum* L.	77	N/A	N/A	0
KAAN	*Kalmia angustifolia* L.	78	N/A	N/A	0
AMLA	*Amelanchier laevis* Wiegand	79	N/A	N/A	0

Table 9. Per Plot Breakdown of Plant Species Richness, Diversity, and Herbaceous Cover at HARV

Plot ID	Species Richness	Shannon Diversity Index	% Total Herbaceous Cover
HARV_033	23	2.57	22
HARV_034	27	2.35	48
HARV_035	13	1.62	16
HARV_036	32	2.83	38
HARV_037	29	2.46	52
HARV_038	31	3.00	24

Plot ID	Species Richness	Shannon Diversity Index	% Total Herbaceous Cover
HARV_039	21	2.49	23
HARV_040	40	2.82	60
HARV_041	30	3.18	19
HARV_042	34	2.71	36
HARV_043	24	2.74	16
HARV_044	42	2.98	50
HARV_045	30	2.95	27
HARV_046	29	2.54	40
HARV_047	40	2.80	38
HARV_048	29	2.54	29
HARV_049	32	2.70	30
HARV_050	26	2.80	19
HARV_051	30	2.28	34
HARV_052	16	2.64	7.00

4.4 Beetles

4.4.1 Site-Specific Methods

Beetle site characterization was conducted in June and July 2010 by NEON staff following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Beetle site characterization data was collected to start site level teaching collections. For sequencing data generated as a result of these efforts, visit the Barcode of Life Datasystems (BOLD) http://www.boldsystems.org/. For more information on this protocol and data product numbers, see Appendix A.

4.4.2 Results

Table 10. HARV Beetle Trap Locations

Trap Location	Lat	Long
1	42.526	-72.183
2	42.527	-72.183
3	42.529	-72.184
4	42.531	-72.189
5	42.535	-72.183
6	42.538	-72.186
7	42.544	-72.176

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

Table 11. HARV Beetle Identification Results

BOLD Sample ID	Family name	Subfamily name	Species name	Collection date	Trap Location
NEONTcarabid1715	Carabidae	Harpalinae	*Chlaenius emarginatus*	7/12/2010	1
NEONTcarabid1831	Carabidae	Harpalinae	*Chlaenius emarginatus*	7/26/2010	1
NEONTcarabid1728	Carabidae	Harpalinae	*Myas cyanescens*	7/12/2010	1
NEONTcarabid1749	Carabidae	Harpalinae	*Poecilus lucublandus*	7/5/2010	1
NEONTcarabid1830	Carabidae	Harpalinae	*Chlaenius emarginatus*	7/26/2010	1
NEONTcarabid1741	Carabidae	Harpalinae	*Syntomus americanus*	7/12/2010	1
NEONTcarabid1666	Carabidae	Nebriinae	*Notiophilus aeneus*	7/5/2010	1
NEONTcarabid1738	Carabidae	Harpalinae	*Syntomus americanus*	7/5/2010	1

BOLD Sample ID	Family name	Subfamily name	Species name	Collection date	Trap Location
NEONTcarabid1832	Carabidae	Carabinae	*Carabus nemoralis*	7/26/2010	1
NEONTcarabid1740	Carabidae	Harpalinae	*Syntomus americanus*	7/12/2010	1
NEONTcarabid1699	Carabidae	Harpalinae	*Poecilus lucublandus*	7/5/2010	1
NEONTcarabid1664	Carabidae	Harpalinae	*Harpalus faunus*	7/5/2010	1
NEONTcarabid1824	Carabidae	Harpalinae	*Harpalus pensylvanicus*	7/19/2010	1
NEONTcarabid1712	Carabidae	Harpalinae	*Chlaenius emarginatus*	7/12/2010	1
NEONTcarabid1667	Carabidae	Harpalinae	*Agonoleptus conjunctus*	7/5/2010	1
NEONTcarabid1785	Carabidae	Carabinae	*Carabus nemoralis*	7/19/2010	1
NEONTcarabid1833	Carabidae	Harpalinae	*Chlaenius emarginatus*	7/19/2010	1
NEONTcarabid1784	Carabidae	Harpalinae	*Myas cyanescens*	7/26/2010	2
NEONTcarabid1745	Carabidae	Harpalinae	*Pterostichus pensylvanicus*	7/12/2010	2
NEONTcarabid1703	Dytiscidae	Unknown	Unknown	7/5/2010	2
NEONTcarabid1726	Carabidae	Harpalinae	*Myas cyanescens*	7/5/2010	2
NEONTcarabid1713	Carabidae	Harpalinae	*Chlaenius emarginatus*	7/5/2010	2
NEONTcarabid1714	Carabidae	Harpalinae	*Chlaenius emarginatus*	7/5/2010	2
NEONTcarabid1702	Dytiscidae	Unknown	Unknown	7/12/2010	2
NEONTcarabid1818	Carabidae	Harpalinae	*Chlaenius emarginatus*	7/19/2010	2
NEONTcarabid1758	Carabidae	Harpalinae	*Agonum retractum*	7/19/2010	2
NEONTcarabid1725	Carabidae	Harpalinae	*Amara lunicollis*	7/5/2010	2
NEONTcarabid1710	Carabidae	Harpalinae	*Chlaenius emarginatus*	7/12/2010	2
NEONTcarabid1727	Carabidae	Harpalinae	*Myas cyanescens*	7/5/2010	2

BOLD Sample ID	Family name	Subfamily name	Species name	Collection date	Trap Location
NEONTcarabid1797	Carabidae	Harpalinae	*Agonum gratiosum*	7/19/2010	3
NEONTcarabid1821	Dytiscidae	Unknown	Unknown	7/26/2010	3
NEONTcarabid1826	Carabidae	Harpalinae	*Agonum gratiosum*	7/26/2010	3
NEONTcarabid1733	Carabidae	Harpalinae	*Agonum retractum*	6/28/2010	3
NEONTcarabid1735	Carabidae	Harpalinae	*Agonum gratiosum*	7/19/2010	3
NEONTcarabid1711	Carabidae	Harpalinae	*Chlaenius emarginatus*	7/26/2010	3
NEONTcarabid1707	Carabidae	Carabinae	*Sphaeroderus canadensis canadensis*	7/5/2010	3
NEONTcarabid1827	Carabidae	Harpalinae	*Agonum mutatum*	7/26/2010	3
NEONTcarabid1730	Carabidae	Harpalinae	*Agonum retractum*	6/21/2010	3
NEONTcarabid1819	Carabidae	Harpalinae	*Agonum gratiosum*	7/26/2010	3
NEONTcarabid1701	Dytiscidae	Unknown	Unknown	6/14/2010	3
NEONTcarabid1736	Carabidae	Harpalinae	*Agonum gratiosum*	7/19/2010	3
NEONTcarabid1665	Carabidae	Brachininae	*Brachinus fulminatus*	7/5/2010	3
NEONTcarabid1823	Carabidae	Harpalinae	*Agonum gratiosum*	7/26/2010	3
NEONTcarabid1731	Carabidae	Harpalinae	*Agonum retractum*	6/21/2010	3
NEONTcarabid1828	Carabidae	Harpalinae	*Agonum gratiosum*	7/26/2010	3
NEONTcarabid1829	Carabidae	Harpalinae	*Agonum gratiosum*	7/26/2010	3
NEONTcarabid1825	Carabidae	Harpalinae	*Agonum mutatum*	7/26/2010	3
NEONTcarabid1820	Carabidae	Harpalinae	*Agonum mutatum*	7/26/2010	3
NEONTcarabid1788	Carabidae	Trechinae	*Trechus apicalis*	7/19/2010	3
NEONTcarabid1700	Dytiscidae	Unknown	Unknown	6/14/2010	3

BOLD Sample ID	Family name	Subfamily name	Species name	Collection date	Trap Location
NEONTcarabid1683	Carabidae	Harpalinae	*Pterostichus rostratus*	6/28/2010	3
NEONTcarabid1706	Carabidae	Carabinae	*Sphaeroderus canadensis canadensis*	7/12/2010	3
NEONTcarabid1632	Carabidae	Harpalinae	*Agonum mutatum*	7/19/2010	3
NEONTcarabid1762	Carabidae	Harpalinae	*Agonum retractum*	7/19/2010	4
NEONTcarabid1747	Carabidae	Harpalinae	*Poecilus lucublandus*	7/12/2010	4
NEONTcarabid1722	Carabidae	Harpalinae	*Amara lunicollis*	6/21/2010	4
NEONTcarabid1721	Carabidae	Harpalinae	*Amara lunicollis*	6/21/2010	4
NEONTcarabid1716	Scarabaeidae	Melolonthinae	*Nipponoserica peregrina*	7/5/2010	4
NEONTcarabid1746	Carabidae	Harpalinae	*Poecilus lucublandus*	7/12/2010	4
NEONTcarabid1724	Carabidae	Harpalinae	*Amara lunicollis*	6/28/2010	4
NEONTcarabid1698	Carabidae	Harpalinae	*Poecilus lucublandus*	6/21/2010	4
NEONTcarabid1739	Carabidae	Harpalinae	*Syntomus americanus*	6/28/2010	4
NEONTcarabid1732	Carabidae	Harpalinae	*Agonum retractum*	6/21/2010	4
NEONTcarabid1719	Scarabaeidae	Melolonthinae	*Nipponoserica peregrina*	7/12/2010	4
NEONTcarabid1748	Carabidae	Harpalinae	*Poecilus lucublandus*	7/12/2010	4
NEONTcarabid1760	Carabidae	Carabinae	*Carabus nemoralis*	7/19/2010	4
NEONTcarabid1792	Carabidae	Harpalinae	*Agonum retractum*	7/26/2010	4
NEONTcarabid1761	Carabidae	Harpalinae	*Cymindis cribricollis*	7/19/2010	4
NEONTcarabid1720	Carabidae	Harpalinae	*Amara lunicollis*	6/21/2010	4
NEONTcarabid1709	Carabidae	Carabinae	*Sphaeroderus stenostomus*	7/19/2010	4

BOLD Sample ID	Family name	Subfamily name	Species name	Collection date	Trap Location
NEONTcarabid1708	Carabidae	Carabinae	*Sphaeroderus stenostomus*	7/12/2010	4
NEONTcarabid1717	Scarabaeidae	Melolonthinae	*Nipponoserica peregrina*	6/14/2010	4
NEONTcarabid1718	Scarabaeidae	Melolonthinae	*Nipponoserica peregrina*	6/14/2010	4
NEONTcarabid1809	Carabidae	Harpalinae	*Syntomus americanus*	7/26/2010	4
NEONTcarabid1672	Carabidae	Harpalinae	*Pterostichus rostratus*	6/21/2010	5
NEONTcarabid1802	Carabidae	Harpalinae	*Cymindis neglecta*	7/26/2010	5
NEONTcarabid1661	Carabidae	Harpalinae	*Cymindis neglecta*	7/19/2010	5
NEONTcarabid1807	Carabidae	Harpalinae	*Synuchus impunctatus*	7/26/2010	5
NEONTcarabid1662	Carabidae	Harpalinae	*Cymindis neglecta*	7/12/2010	5
NEONTcarabid1729	Carabidae	Harpalinae	*Cymindis cribricollis*	6/21/2010	5
NEONTcarabid1744	Carabidae	Harpalinae	*Pterostichus pensylvanicus*	6/8/2010	6
NEONTcarabid1705	Carabidae	Carabinae	*Sphaeroderus canadensis canadensis*	6/28/2010	7
NEONTcarabid1704	Carabidae	Carabinae	*Sphaeroderus canadensis canadensis*	6/28/2010	7

4.5 Mosquitoes

4.5.1 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 sequencing data generated as a

result of these efforts, visit the Barcode of Life Datasystems (BOLD) http://www.boldsystems.org/. For more information on this protocol and data product numbers see Appendix A.

4.5.2 Results

Table 12. HARV Mosquito Trapping Locations

Trap Location	Lat	Long
1	42.526	-72.183
2	42.527	-72.183
3	42.529	-72.184
4	42.531	-72.189
5	42.535	-72.183
6	42.538	-72.186
7	42.544	-72.176

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

Table 13. HARV Mosquito (Family Culicidae) Identification Results

BOLD Sample ID	Subfamily name	Species name	Collection date	Trap Location
NEONTculicid1556	Culicinae	*Culex restuans*	7/20/2010	1
NEONTculicid1547	Culicinae	*Coquillettidia perturbans*	7/13/2010	1
NEONTculicid2090	Culicinae	*Culiseta melanura*	7/21/2010	1
NEONTculicid1548	Culicinae	*Culex territans*	7/13/2010	1
NEONTculicid1570	Culicinae	*Aedes canadensis*	7/28/2010	1
NEONTculicid1555	Culicinae	*Culiseta melanura*	7/20/2010	1

BOLD Sample ID	Subfamily name	Species name	Collection date	Trap Location
NEONTculicid2081	Culicinae	*Culiseta morsitans*	7/27/2010	1
NEONTculicid2089	Culicinae	*Culiseta melanura*	7/21/2010	1
NEONTculicid2087	Culicinae	*Culiseta melanura*	7/21/2010	1
NEONTculicid2082	Culicinae	*Culiseta morsitans*	7/27/2010	1
NEONTculicid1557	Culicinae	*Aedes vexans*	7/20/2010	1
NEONTculicid2063	Anophelinae	*Anopheles punctipennis*	7/14/2010	1
NEONTculicid1552	Culicinae	*Culiseta impatiens*	7/14/2010	1
NEONTculicid1569	Culicinae	*Culiseta morsitans*	7/28/2010	1
NEONTculicid1562	Culicinae	*Culex restuans*	7/27/2010	1
NEONTculicid1549	Anophelinae	*Anopheles punctipennis*	7/13/2010	1
NEONTculicid1563	Culicinae	*Aedes cinereus*	7/27/2010	1
NEONTculicid1553	Culicinae	*Aedes excrucians*	7/14/2010	1
NEONTculicid1546	Culicinae	*Coquillettidia perturbans*	7/13/2010	1
NEONTculicid2064	Anophelinae	*Anopheles punctipennis*	7/20/2010	1
NEONTculicid2091	Culicinae	*Culiseta melanura*	7/21/2010	1
NEONTculicid1571	Culicinae	*Culex territans*	7/28/2010	2
NEONTculicid1542	Culicinae	*Coquillettidia perturbans*	7/7/2010	2
NEONTculicid2075	Culicinae	*Culex territans*	7/7/2010	2
NEONTculicid2096	Culicinae	*Culiseta melanura*	7/21/2010	2
NEONTculicid1541	Culicinae	*Coquillettidia perturbans*	7/7/2010	2
NEONTculicid1572	Culicinae	*Culex territans*	7/28/2010	2

BOLD Sample ID	Subfamily name	Species name	Collection date	Trap Location
NEONTculicid1574	Culicinae	*Aedes canadensis*	7/28/2010	2
NEONTculicid2077	Culicinae	*Culex territans*	7/7/2010	2
NEONTculicid1560	Culicinae	*Culiseta melanura*	7/21/2010	2
NEONTculicid1573	Culicinae	*Culiseta morsitans*	7/28/2010	2
NEONTculicid2095	Culicinae	*Culiseta melanura*	7/21/2010	2
NEONTculicid2074	Culicinae	*Culex territans*	7/7/2010	2
NEONTculicid1561	Culicinae	*Culex territans*	7/21/2010	2
NEONTculicid1559	Culicinae	*Aedes canadensis*	7/20/2010	2
NEONTculicid2076	Culicinae	*Culex territans*	7/7/2010	2
NEONTculicid1537	Culicinae	*Culex salinarius*	6/30/2010	3
NEONTculicid1554	Culicinae	*Aedes cinereus*	7/20/2010	3
NEONTculicid1888	Culicinae	*Culiseta melanura*	6/29/2010	3
NEONTculicid1566	Culicinae	*Culiseta morsitans*	7/28/2010	3
NEONTculicid2078	Culicinae	*Culex territans*	6/16/2010	3
NEONTculicid2085	Culicinae	*Culiseta morsitans*	7/27/2010	3
NEONTculicid2093	Culicinae	*Culiseta melanura*	7/27/2010	3
NEONTculicid1886	Culicinae	*Culiseta melanura*	6/29/2010	3
NEONTculicid1887	Culicinae	*Culiseta melanura*	6/29/2010	3
NEONTculicid2067	Culicinae	*Culex restuans*	6/15/2010	3
NEONTculicid1543	Culicinae	*Aedes canadensis*	7/13/2010	3
NEONTculicid1885	Culicinae	*Culiseta melanura*	6/29/2010	3

BOLD Sample ID	Subfamily name	Species name	Collection date	Trap Location
NEONTculicid2066	Culicinae	*Culex restuans*	6/15/2010	3
NEONTculicid1544	Culicinae	*Aedes canadensis*	7/13/2010	3
NEONTculicid1883	Culicinae	*Culiseta melanura*	6/29/2010	3
NEONTculicid1515	Culicinae	*Culex salinarius*	6/8/2010	3
NEONTculicid1884	Culicinae	*Culiseta melanura*	6/29/2010	3
NEONTculicid1891	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1901	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid2046	Culicinae	*Aedes excrucians*	6/9/2010	4
NEONTculicid1871	Culicinae	*Culiseta melanura*	6/22/2010	4
NEONTculicid2086	Culicinae	*Culiseta morsitans*	7/28/2010	4
NEONTculicid1900	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1527	Culicinae	*Aedes aurifer*	6/16/2010	4
NEONTculicid2079	Culicinae	*Culex territans*	6/16/2010	4
NEONTculicid1873	Culicinae	*Culiseta melanura*	6/22/2010	4
NEONTculicid1568	Culicinae	*Aedes triseriatus*	7/28/2010	4
NEONTculicid2059	Culicinae	*Aedes triseriatus*	7/21/2010	4
NEONTculicid1877	Culicinae	*Culiseta melanura*	6/22/2010	4
NEONTculicid2057	Culicinae	*Aedes triseriatus*	7/20/2010	4
NEONTculicid1879	Culicinae	*Culiseta melanura*	6/23/2010	4
NEONTculicid1893	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1525	Culicinae	*Coquillettidia perturbans*	6/16/2010	4

BOLD Sample ID	Subfamily name	Species name	Collection date	Trap Location
NEONTculicid1551	Culicinae	*Aedes japonicus*	7/14/2010	4
NEONTculicid2084	Culicinae	*Culiseta morsitans*	7/27/2010	4
NEONTculicid2058	Culicinae	*Aedes triseriatus*	7/20/2010	4
NEONTculicid2044	Culicinae	*Culex salinarius*	7/6/2010	4
NEONTculicid2045	Culicinae	*Aedes excrucians*	6/9/2010	4
NEONTculicid1874	Culicinae	*Culiseta melanura*	6/22/2010	4
NEONTculicid1876	Culicinae	*Culiseta melanura*	6/22/2010	4
NEONTculicid1895	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1534	Culicinae	*Culex salinarius*	6/22/2010	4
NEONTculicid1878	Culicinae	*Culiseta melanura*	6/23/2010	4
NEONTculicid2080	Culicinae	*Culex territans*	6/16/2010	4
NEONTculicid1875	Culicinae	*Culiseta melanura*	6/22/2010	4
NEONTculicid1894	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1882	Culicinae	*Culiseta melanura*	6/23/2010	4
NEONTculicid1870	Culicinae	*Culiseta melanura*	6/22/2010	4
NEONTculicid1528	Culicinae	*Aedes cinereus*	6/16/2010	4
NEONTculicid2060	Culicinae	*Aedes triseriatus*	7/27/2010	4
NEONTculicid1880	Culicinae	*Culiseta melanura*	6/23/2010	4
NEONTculicid1892	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1898	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1872	Culicinae	*Culiseta melanura*	6/22/2010	4

BOLD Sample ID	Subfamily name	Species name	Collection date	Trap Location
NEONTculicid1897	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1890	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1899	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1889	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1896	Culicinae	*Culiseta melanura*	6/29/2010	4
NEONTculicid1881	Culicinae	*Culiseta melanura*	6/23/2010	4
NEONTculicid1565	Culicinae	*Aedes canadensis*	7/28/2010	5
NEONTculicid2065	Anophelinae	*Anopheles punctipennis*	7/27/2010	5
NEONTculicid1521	Culicinae	*Coquillettidia perturbans*	6/16/2010	5
NEONTculicid1536	Anophelinae	*Anopheles punctipennis*	6/30/2010	5
NEONTculicid1531	Culicinae	*Aedes canadensis*	6/22/2010	6
NEONTculicid2049	Culicinae	*Aedes excrucians*	6/22/2010	6
NEONTculicid2050	Culicinae	*Aedes excrucians*	6/22/2010	6
NEONTculicid2061	Culicinae	*Aedes vexans*	6/23/2010	6
NEONTculicid1538	Culicinae	*Culex salinarius*	6/30/2010	6
NEONTculicid2043	Culicinae	*Aedes cinereus*	6/9/2010	6
NEONTculicid2047	Culicinae	*Aedes excrucians*	6/22/2010	6
NEONTculicid1532	Culicinae	*Aedes canadensis*	6/22/2010	6
NEONTculicid1533	Culicinae	*Aedes excrucians*	6/22/2010	6
NEONTculicid2048	Culicinae	*Aedes excrucians*	6/22/2010	6
NEONTculicid2054	Culicinae	*Aedes japonicus*	6/30/2010	7

BOLD Sample ID	Subfamily name	Species name	Collection date	Trap Location
NEONTculicid2051	Culicinae	*Aedes japonicus*	6/30/2010	7
NEONTculicid1516	Culicinae	*Coquillettidia perturbans*	6/9/2010	7
NEONTculicid1517	Culicinae	*Coquillettidia perturbans*	6/9/2010	7
NEONTculicid2056	Culicinae	*Aedes japonicus*	6/30/2010	7
NEONTculicid2052	Culicinae	*Aedes japonicus*	6/30/2010	7
NEONTculicid2068	Culicinae	*Culex restuans*	6/9/2010	7
NEONTculicid2055	Culicinae	*Aedes japonicus*	6/30/2010	7
NEONTculicid1535	Culicinae	*Aedes japonicus*	6/29/2010	7
NEONTculicid2053	Culicinae	*Aedes japonicus*	6/30/2010	7

4.6 Ticks

4.6.1 Site-Specific Methods

There was no tick site characterization work done at Harvard Forest. For more information on this protocol and data product numbers, see Appendix A.

4.7 Species Reference Lists

A review of the literature for taxonomic lists of interest for each site was conducted prior to field work. In the case of vertebrates that NEON may capture (e.g., herptiles, 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), 1-1772.

Brues, C. T. 1947. Changes in the insect fauna of a New England woodland following the application of DDT. Harvard Forest Paper No. 1 1: 18.

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.

Motzkin G, Wilson P. 2003. Bryophyte Species at Harvard Forest 1994. Harvard Forest Data Archive: HF057.

Motzkin G. 2003. Vascular Plant Species at Harvard Forest 1992. Harvard Forest Data Archive: HF056.

5 RELOCATABLE SITE 1: BARTLETT EXPERIMENTAL FOREST

The Bartlett Experimental Forest is an actively researched forest; managed portions (30%) reflect a range of forest patch sizes and structural distributions.

Exogenous factors likely to affect forest growth and composition into the future include climate change, increasing regional rates of atmospheric deposition (S, N and Hg), and new invasive species, such as the hemlock wooly adelgid, emerald ash borer, and Asian long horned beetle, whose ranges are likely to expand within the region. Bartlett Experimental Forest also represents the most Northeastern NEON site, and anchors the top of the north-south nitrogen deposition gradient along the eastern-side of the US.

Key Characteristics:

- Site host: U.S. Forest Service
- Carroll County, New Hampshire
- Area: 23.27km^2
- Elevation: 232-629m
- Dominant vegetation type: The Bartlett site is primarily Eastern Deciduous, boreal ecotone. The primary forest cover type is the sugar maple-beech-yellow birch type. The upper elevations support stands of spruce (*Picea rubens*) and fir (*Abies balsamea*). Softwoods such as hemlock (*Tsuga canadensis*), balsam fir and spruce are commonly mixed with hardwoods, especially on cool steep slopes or on the poorly drained soils at lower elevations. Although white pine occurs mostly in stands at lower elevations, scattered specimens can be found over a large part of the forest. The site provides the deciduous-to-boreal forest transitional ecotone towards the ecosystems in the North.
- General management: The Bartlett forest has a history of logging dating from colonial times through the beginning of the 20th century. Approximately 70% of the land area has remained uncut since the early 1900s. Natural disturbances include late 19th century fire, beech scale-Nectria complex (beech bark disease) beginning in the 1940s, severe wind disturbance resulting from hurricanes in 1938 and 1954, and a damaging ice storm in 1998.

5.1 TOS Spatial Sampling Design

TOS plots were allocated at BART 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 plots that are distributed throughout the site according to the spatial design are hereafter referred to as 'Distributed Plots'. TOS plots that are

randomly allocated within the airshed of the NEON Terrestrial Instrument System (TIS) tower to collect complementary data are not stratified by NLCD class; these plots are hereafter referred to as 'Tower Plots'. The maps below depict the plot locations for the first year of NEON sampling. Some plot locations may change over time due to logistics, safety, and science requirements. Please visit the NEON website (http://www.neonscience.org) for updated plot locations at each site.

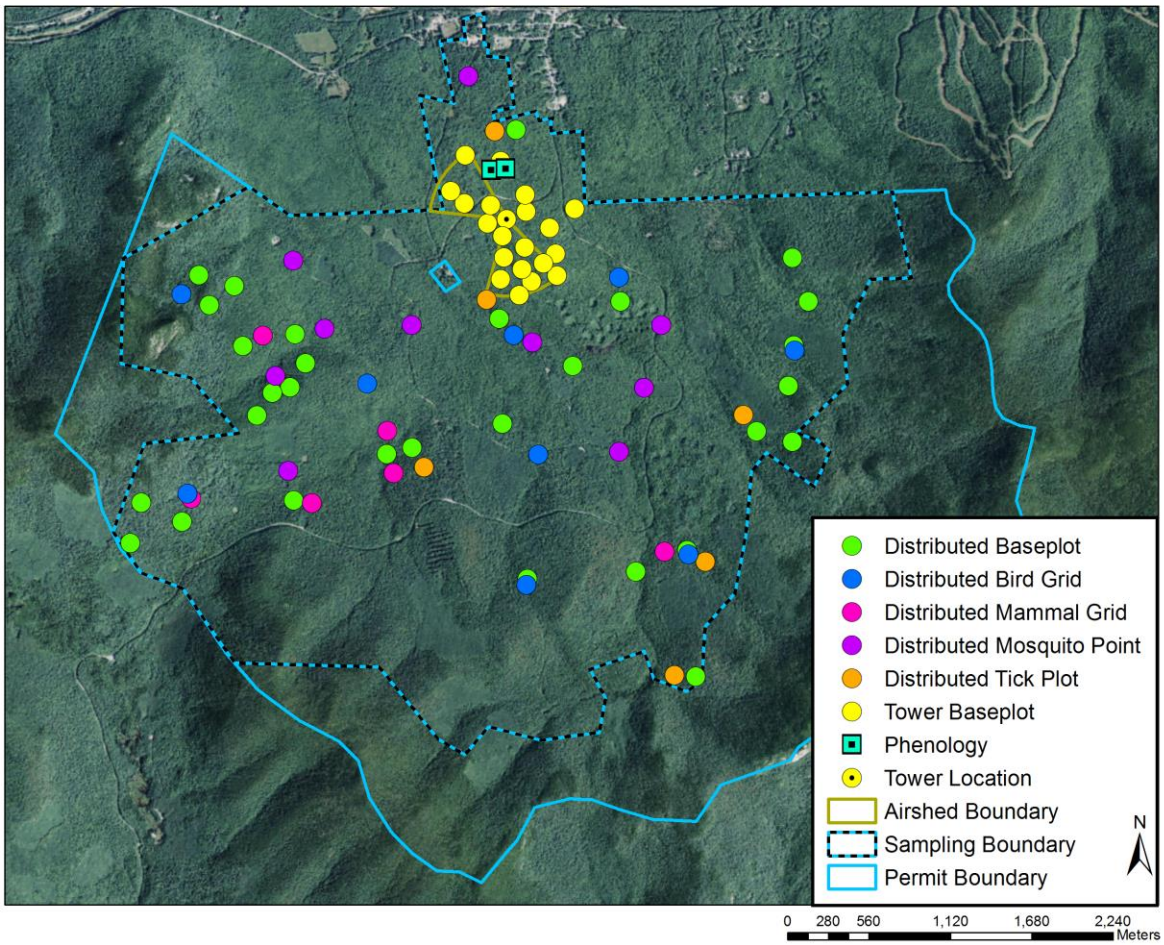

Figure 6. Map of the TOS plot locations within the NEON TOS sampling boundary at BART.

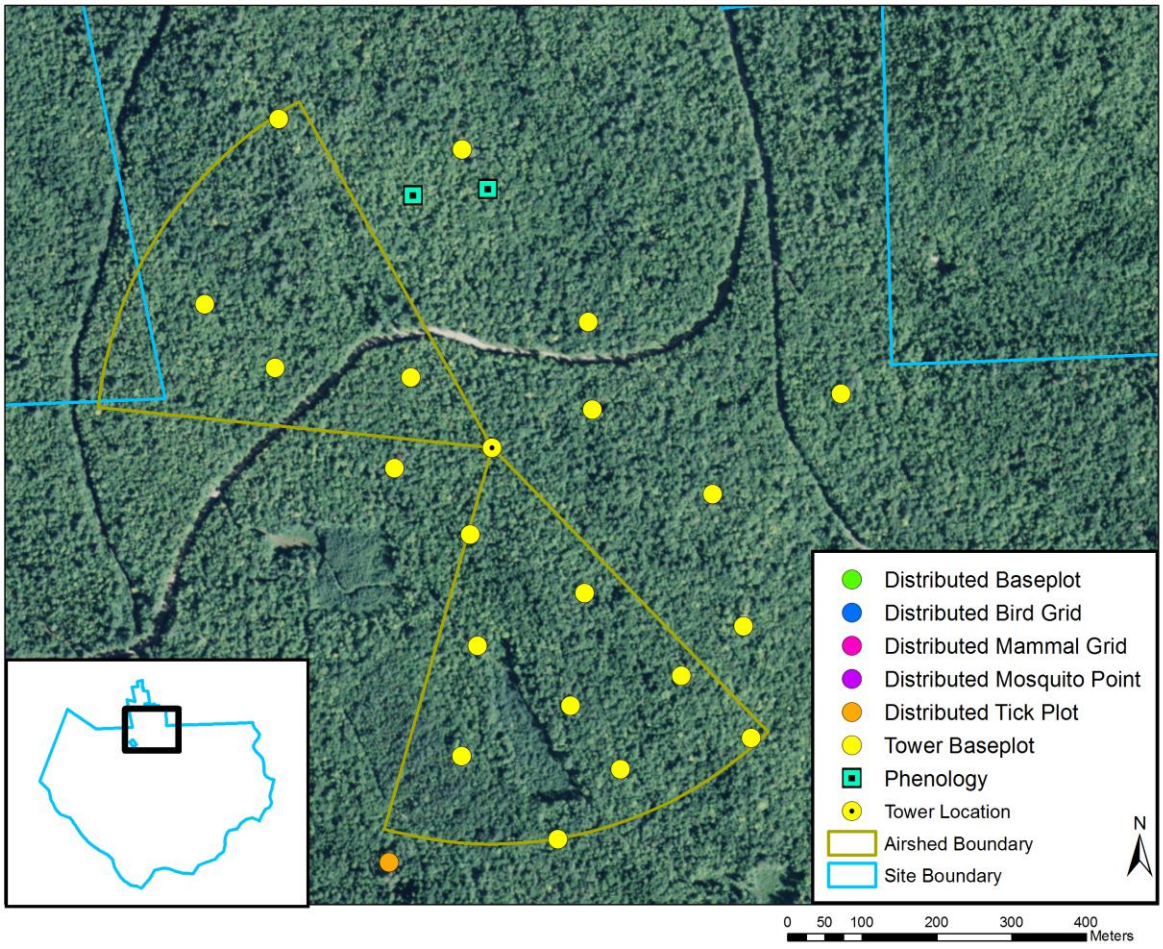

Figure 7. Map of the airshed area at Bartlett Forest.

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

Table 14. NLCD Land Cover Classes and Area within the TOS site boundary at BART.

NLCD Class	Site Area (km^2)	Percent (%)
Mixed Forest	7.84	50.19
Deciduous Forest	5.50	35.22
Evergreen Forest	1.86	11.92

Developed Open Space	.22	1.43
Shrub Scrub	.09	0.6
Grassland Herbaceous	.05	0.33
Woody Wetlands	.03	0.18
Developed Low Intensity	.02	0.13

Table 15. NLCD Land Lover classes and TOS plot numbers at BART.

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

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Base	Deciduous Forest	10
Distributed	Base	Evergreen Forest	9
Distributed	Base	Mixed Forest	7
Distributed	Base	Woody Wetland	4
Distributed	Bird	Deciduous Forest	4
Distributed	Bird	Evergreen Forest	3
Distributed	Bird	Mixed Forest	3
Distributed	Bird	Woody Wetland	2
Distributed	Mammal	Deciduous Forest	3
Distributed	Mammal	Evergreen Forest	3
Distributed	Mammal	Mixed Forest	2
Distributed	Mammal	Woody Wetland	0
Distributed	Mosquito	Deciduous Forest	4
Distributed	Mosquito	Evergreen Forest	3

Plot Type	Plot Subtype	NLCD Class	Number of Plots Established
Distributed	Mosquito	Mixed Forest	2
Distributed	Mosquito	Woody Wetland	1
Distributed	Tick	Deciduous Forest	2
Distributed	Tick	Evergreen Forest	2
Distributed	Tick	Mixed Forest	1
Distributed	Tick	Woody Wetland	1
Tower	Phenology	NA	2
Tower	Tower Plot	NA	20

Table 16. Number of Distributed Base Plots per NLCD Land Cover Class per protocol at BART.

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

Plot Type	Plot Subtype	Protocols	NLCD Class	Number of Plots
Distributed	Base Plot	Beetles	Deciduous Forest	3
Distributed	Base Plot	Beetles	Evergreen Forest	3
Distributed	Base Plot	Beetles	Mixed Forest	4
Distributed	Base Plot	Biogeochemistry	Deciduous Forest	2
Distributed	Base Plot	Biogeochemistry	Evergreen Forest	2
Distributed	Base Plot	Biogeochemistry	Mixed Forest	2
Distributed	Base Plot	Canopy Foliage Chemistry	Deciduous Forest	2
Distributed	Base Plot	Canopy Foliage Chemistry	Evergreen Forest	2

Plot Type	Plot Subtype	Protocols	NLCD Class	Number of Plots
Distributed	Base Plot	Canopy Foliage Chemistry	Mixed Forest	2
Distributed	Base Plot	Coarse Downed Debris	Deciduous Forest	6
Distributed	Base Plot	Coarse Downed Debris	Evergreen Forest	6
Distributed	Base Plot	Coarse Downed Debris	Mixed Forest	8
Distributed	Base Plot	Digital Hemispherical Photos for Leaf Area Index	Deciduous Forest	6
Distributed	Base Plot	Digital Hemispherical Photos for Leaf Area Index	Evergreen Forest	6
Distributed	Base Plot	Digital Hemispherical Photos for Leaf Area Index	Mixed Forest	8
Distributed	Base Plot	Herbaceous Productivity	Deciduous Forest	6
Distributed	Base Plot	Herbaceous Productivity	Evergreen Forest	6
Distributed	Base Plot	Herbaceous Productivity	Mixed Forest	8
Distributed	Base Plot	Plant Diversity	Deciduous Forest	9
Distributed	Base Plot	Plant Diversity	Evergreen Forest	9
Distributed	Base Plot	Plant Diversity	Mixed Forest	12
Distributed	Base Plot	Soil Microbes	Deciduous Forest	2
Distributed	Base Plot	Soil Microbes	Evergreen Forest	2
Distributed	Base Plot	Soil Microbes	Mixed Forest	2
Distributed	Base Plot	Vegetation Structure	Deciduous Forest	6
Distributed	Base Plot	Vegetation Structure	Evergreen Forest	6
Distributed	Base Plot	Vegetation Structure	Mixed Forest	8

Table 17. Number of Tower Base Plots per protocol at BART.

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

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

5.2 Belowground Biomass

5.2.1 Site-Specific Methods

Belowground biomass characterization data were collected down to 160 cm by NEON staff in August 2013. Since the NEON protocol for long-term, operational sampling of belowground biomass only collects data to a depth of 30cm, 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 (RD[8]) for more information. Samples were collected

following the standard methods outlined in TOS Site Characterization Methods (RD[6]) except a 5.08cm diameter bulk density soil corer was used to extract soil instead of a soil knife. The tables below summarize the belowground biomass site characterization work and more data and information can be found by searching the data product numbers in Appendix A.

5.2.2 Results

Table 18. BART fine root mass per depth increment (mg/cm^3)

Upper Depth	Lower Depth	Average Mass per Increment mg/cm^3	Standard Deviation
0	10	11.12	5.25
10	20	7.49	0.21
20	30	5.14	4.90
30	40	0.83	0.55
40	50	0.26	0.13
50	60	0.12	0.07
60	70	0.18	0.10
70	80	0.38	0.39
80	90	0.10	0.14
90	100	0.21	0.19
100	120	0.05	0.06
120	140	0.00	0.00
140	160	0.01	0.01

Table 19. BART cumulative fine root mass as a function of depth (g/m^2)

Upper Depth	Lower Depth	Average Mass per Increment g/m^2	Standard Deviation
0	10	1111.66	525.02

Upper Depth	Lower Depth	Average Mass per Increment g/m^2	Standard Deviation
10	20	1860.66	526.11
20	30	2374.34	528.15
30	40	2457.78	548.85
40	50	2483.63	556.12
50	60	2495.91	562.28
60	70	2513.51	571.04
70	80	2551.36	588.96
80	90	2561.25	593.45
90	100	2582.53	594.84
100	120	2592.58	582.14
120	140	2593.13	582.47
140	160	2594.09	580.90

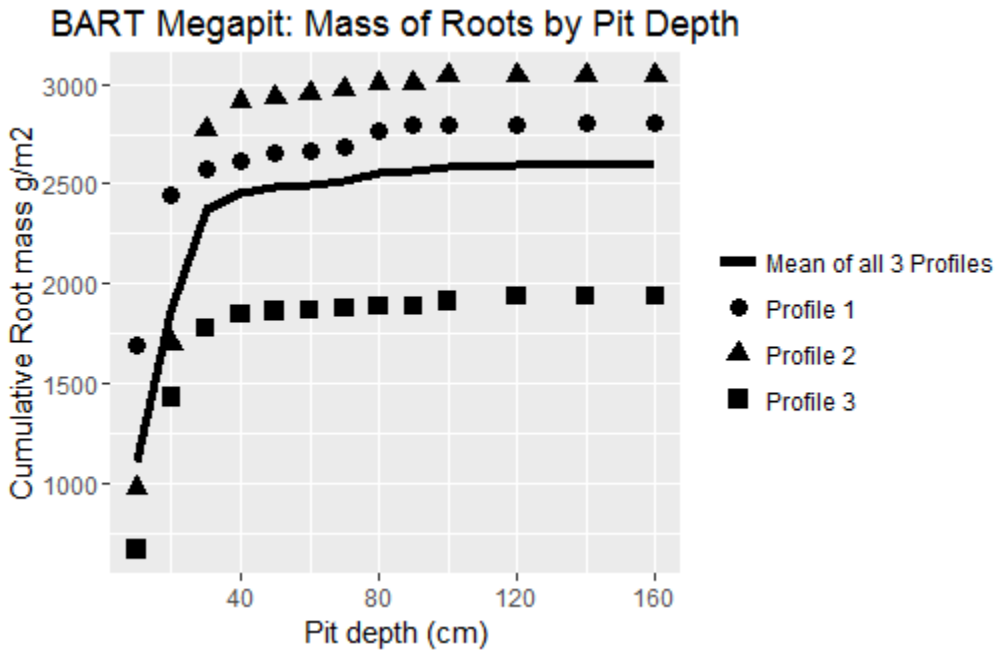

Figure 8. BART Cumulative Root Mass by Pit Depth

Table 20. BART fine root biomass sampling summary data

Total Pit Depth	160 cm
Total Cumulative Mass at 30cm (g/m^2)	2374.34
Total Cumulative Mass at 100cm (g/m^2)	2582.53
Total Cumulative Mass (g/m^2)	2594.09

5.3 Plant Characterization and Phenology Species Selection

5.3.1 Site-Specific Methods

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

5.3.2 Results

Table 21. Site Plant Characterization and Phenology Species Summary at BART

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

Taxon ID	Scientific Name	Rank	Mean % Cover	Mean Canopy Area per m^2	Mean ABH cm^2 per m^2
FAGR	*Fagus grandifolia* Ehrh.	1	40	N/A	0.88
TSCA	*Tsuga canadensis* (L.)	2	5	0.018	7.89
ACRU	*Acer rubrum* L.	3	<1	0.011	7.9
BEAL2	*Betula alleghaniensis* Britton	4	2	N/A	2.55
FRAM2	*Fraxinus americana* L.	5	<1	N/A	1.48
ACSAS	*Acer saccharum* Marshall var. saccharum	6	N/A	N/A	1.22
PIRU	*Picea rubens* Sarg.	7	2	0	0.36
ACPE	*Acer pensylvanicum* L.	8	2	N/A	0.05
VILA11	*Viburnum lantanoides* Michx.	9	2	N/A	N/A
DRIN5	*Dryopteris intermedia* (Muhl. ex Willd.) A. Gray	10	1	N/A	N/A
PIST	*Pinus strobus* L.	11	<1	N/A	0.45
BEPA	*Betula papyrifera* Marshall	13	<1	N/A	0.3
ACSA3	*Acer saccharum* Marshall	15	<1	N/A	N/A
HAVI4	*Hamamelis virginiana* L.	16	<1	N/A	0
ABBA	*Abies balsamea* (L.) Mill.	17	<1	N/A	0.05
POTR5	*Populus tremuloides* Michx.	18	N/A	N/A	0.17

Taxon ID	Scientific Name	Rank	Mean % Cover	Mean Canopy Area per m^2	Mean ABH cm^2 per m^2
MEVI	*Medeola virginiana* L.	19	<1	N/A	N/A
TACA7	*Taxus canadensis* Marshall	20	<1	N/A	N/A
TIAM	*Tilia americana* L.	21	<1	N/A	0.07
PIRE	*Pinus resinosa* Aiton	22	<1	N/A	0.08
OSCL2	*Osmunda claytoniana* L.	24	<1	N/A	N/A
DEPU2	*Dennstaedtia punctilobula* (Michx.) T. Moore	25	<1	N/A	N/A
MIRE	*Mitchella repens* L.	27	<1	N/A	N/A
MACA4	*Maianthemum canadense* Desf.	28	<1	N/A	N/A
FRNI	*Fraxinus nigra* Marshall	29	<1	N/A	0.01
POGR4	*Populus grandidentata* Michx.	30	N/A	N/A	0.05
RUPU	*Rubus pubescens* Raf.	31	<1	N/A	N/A
ATFI	*Athyrium filix-femina* (L.) Roth	32	<1	N/A	N/A
TRUN	*Trillium undulatum* Willd.	33	<1	N/A	N/A
QURU	*Quercus rubra* L.	34	<1	N/A	0.03
UVSE	*Uvularia sessilifolia* L.	35	<1	N/A	N/A
ARNU2	*Aralia nudicaulis* L.	36	<1	N/A	N/A
TRBO2	*Trientalis borealis* Raf.	37	<1	N/A	N/A
PRSE2	*Prunus serotina* Ehrh.	38	<1	N/A	N/A
MOUN3	*Monotropa uniflora* L.	39	<1	N/A	N/A
OXMO	*Oxalis montana* Raf.	39	<1	N/A	N/A

Taxon ID	Scientific Name	Rank	Mean % Cover	Mean Canopy Area per m^2	Mean ABH cm^2 per m^2
CLBO3	*Clintonia borealis* (Aiton) Raf.	41	<1	N/A	N/A
LYOB	*Lycopodium obscurum* L.	41	<1	N/A	N/A
PYEL	*Pyrola elliptica* Nutt.	41	<1	N/A	N/A
GAPR2	*Gaultheria procumbens* L.	45	<1	N/A	N/A
HULU2	*Huperzia lucidula* (Michx.) Trevis.	46	<1	N/A	N/A
VICU	*Viola cucullata* Aiton	46	<1	N/A	N/A
DARE	*Dalibarda repens* L.	48	<1	N/A	N/A
LYAN2	*Lycopodium annotinum* L.	49	<1	N/A	N/A
PTAQ	*Pteridium aquilinum* (L.) Kuhn	50	<1	N/A	N/A
RUOC	*Rubus occidentalis* L.	50	<1	N/A	N/A
THNO	*Thelypteris noveboracensis* (L.) Nieuwl.	50	<1	N/A	N/A
ACSP2	*Acer spicatum* Lam.	53	<1	N/A	N/A
COTR2	*Coptis trifolia* (L.) Salisb.	53	<1	N/A	N/A
EPVI2	*Epifagus virginiana* (L.) W.P.C. Barton	53	<1	N/A	N/A
TORA2	*Toxicodendron radicans* (L.) Kuntze	53	<1	N/A	N/A
CHUM	*Chimaphila umbellata* (L.) W.P.C. Barton	57	<1	N/A	N/A
LYCL	*Lycopodium clavatum* L.	57	<1	N/A	N/A
TICO	*Tiarella cordifolia* L.	57	<1	N/A	N/A

Taxon ID	Scientific Name	Rank	Mean % Cover	Mean Canopy Area per m^2	Mean ABH cm^2 per m^2
VEVI	*Veratrum viride* Aiton	57	<1	N/A	N/A
VINU	*Viburnum nudum* L.	57	<1	N/A	N/A
ILVE	*Ilex verticillata* (L.) A. Gray	62	<1	N/A	N/A
ARTR	*Arisaema triphyllum* (L.) Schott	63	<1	N/A	N/A
CASC13	*Carex scabrata* Schwein.	63	<1	N/A	N/A
CIAL	*Circaea alpina* L.	63	<1	N/A	N/A
GOTE	*Goodyera tesselata* Lodd.	63	<1	N/A	N/A
LYCO3	*Lycopodium complanatum* L.	63	<1	N/A	N/A
MARA7	*Maianthemum racemosum* (L.) Link	63	<1	N/A	N/A
OCAC	*Oclemena acuminata* (Michx.) Greene	63	<1	N/A	N/A
BIDEN	*Bidens* sp.	70	<1	N/A	N/A
CHGL2	*Chelone glabra* L.	70	<1	N/A	N/A
CYAC3	*Cypripedium acaule* Aiton	70	<1	N/A	N/A
LOCA7	*Lonicera canadensis* W. Bartram ex Marshall	70	<1	N/A	N/A
LYUN	*Lycopus uniflorus* Michx.	70	<1	N/A	N/A
OSCI	*Osmunda cinnamomea* L.	70	<1	N/A	N/A
PLDI3	*Platanthera dilatata* (Pursh) Lindl. ex Beck	70	<1	N/A	N/A
POPU5	*Polygonum punctatum* Elliott	70	<1	N/A	N/A

Taxon ID	Scientific Name	Rank	Mean % Cover	Mean Canopy Area per m^2	Mean ABH cm^2 per m^2
ULAM	*Ulmus americana* L.	70	<1	N/A	N/A
AMELA	*Amelanchier* sp.	79	<1	N/A	N/A
ACSA2	*Acer saccharinum* L.	80	<1	N/A	N/A
ATFIA	*Athyrium filix-femina* (L.) Roth ssp. angustum (Willd.) R.T. Clausen	81	N/A	N/A	N/A
ATFIA	*Athyrium filix-femina* (L.) Roth ssp. *angustum (Willd.)* R.T. Clausen	81	N/A	N/A	N/A
FRAXI	*Fraxinus* sp.	81	N/A	N/A	N/A
FRPE	*Fraxinus pennsylvanica Marshall*	81	N/A	N/A	N/A
ONSE	*Onoclea sensibilis* L.	81	N/A	N/A	N/A
OSCIC	*Osmunda cinnamomea* L. var. cinnamomea	81	N/A	N/A	N/A
PINACE	*Pinaceae* sp.	81	N/A	N/A	N/A
PTAQL	*Pteridium aquilinum* (L.) Kuhn var. latiusculum (Desv.) Underw. ex A. Heller	81	N/A	N/A	N/A

Table 22. Per Plot Breakdown of Species Richness, Diversity, and Herbaceous Cover at BART.

Plot ID	Species Richness	Shannon Diversity Index	% Total Herbaceous Cover
1099	18	2.02	39
1163	12	1.77	29
2043	22	2.74	31
20875	19	2.21	2

Plot ID	Species Richness	Shannon Diversity Index	% Total Herbaceous Cover
2379	6	1.64	8
2443	15	2.30	24
267	9	2.20	9
2763	34	2.89	78
2827	4	1.10	8
2891	13	2.50	15
331	6	1.79	6
3467	9	1.95	15
3659	29	3.03	48
40587	9	2.02	13
4091	16	2.77	16
587	15	2.32	35
651	7	1.52	13
75	19	2.93	20
779	6	1.71	8
8011	15	2.69	16

5.4 Beetles

5.4.1 Site-Specific Methods

Beetle site characterization was conducted in June 2013 by NEON staff following the standard methods outlined in TOS Site Characterization Methods (RD[6]). Beetle site characterization data was collected to start site level teaching collections. All samples were pooled before sending to a taxonomist for identification. For sequencing data generated as a result of these efforts, visit the Barcode of Life

Datasystems (BOLD) http://www.boldsystems.org/. For more information on this protocol and data product numbers see Appendix A.

5.4.2 Results

Table 23. BART (Family Carabidae) Beetle Identification Results

BOLD individual ID	genus	species	sex	Collection Date
NEONTcarabid8099	*Cymindis*	*cribricollis*	m	6/15/2013
NEONTcarabid8100	*Notiophilus*	*aeneus*	m	6/15/2013
NEONTcarabid8102	*Platynus*	*decentis*	m	6/15/2013
NEONTcarabid8092	*Pterostichus*	*coracinus*	f	6/15/2013
NEONTcarabid8093	*Pterostichus*	*coracinus*	m	6/15/2013
NEONTcarabid8095	*Pterostichus*	*coracinus*	m	6/15/2013
NEONTcarabid8096	*Pterostichus*	*coracinus*	f	6/15/2013
NEONTcarabid8097	*Pterostichus*	*coracinus*	f	6/15/2013
NEONTcarabid8098	*Pterostichus*	*coracinus*	f	6/15/2013
NEONTcarabid8104	*Pterostichus*	*coracinus*	f	6/15/2013
NEONTcarabid8101	*Pterostichus*	*pensylvanicus*	f	6/15/2013
NEONTcarabid8103	*Pterostichus*	*pensylvanicus*	f	6/15/2013
NEONTcarabid8094	*Pterostichus*	*rostratus*	m	6/15/2013

5.5 Mosquitoes

5.5.1 Site-Specific Methods

Mosquito site characterization was conducted in June 2013 by NEON staff following the standard methods outlined in TOS Site Characterization Methods (RD[6]) to test protocol methods and start site level species lists. For more information on this protocol and data product numbers, see Appendix A. All

samples were pooled before sending to a taxonomist for identification. No pathogen testing was performed.

5.5.2 Results

Table 24. BART Mosquito (Family Culicidae, subfamily Culicinae) Identification Results

vialID	Scientific Name	sex	Individual Count	Vial ID Percent Not Counted
BART.June2013.SC.1	*Aedes canadensis canadensis*	female	116	81.3
BART.June2013.SC.1	*Aedes communis*	female	122	81.3
BART.June2013.SC.1	*Aedes excrucians*	female	33	81.3
BART.June2013.SC.1	*Aedes vexans*	female	2	81.3
BART.June2013.SC.1	*Aedes* spp.	female	11	81.3
BART.June2013.SC.1	*Aedes* spp.	male	6	81.3
BART.June2013.SC.1	*Coquilllettidia perturbans*	female	10	81.3

5.6 Ticks

5.6.1 Site-Specific Methods

Tick drags were conducted at Bartlett in the summer of 2013 to test protocol methods and ticks were collected for identification. Dragging was conducted approximately 20 km from BART at Silver Lake, New Hampshire. No pathogen sampling was conducted. For more information on this protocol and data product numbers ,see Appendix A.

5.6.2 Results

Table 25. BART Tick (Family: Ixodidae) Identification Results

Subfamily	Genus	Species	Number Adult Male	Number Adult Female

Rhipicephalinae	*Dermacentor*	*variabilis*	4	6
Ixodinae	*Ixodes*	*scapularis*	0	3

5.7 Species Reference Lists

A review of the literature for taxonomic lists of interest for each site was conducted prior to field work. In the case of vertebrates that NEON may capture (e.g., herptiles, 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.

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.

Filip, S.M., Little, E.L. Jr. 1971. Trees and shrubs of the Bartlett Experimental Forest, Carroll County, New Hampshire. Res. Paper NE-211. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 20 p.

Lea. William B, and Yamasaki Mariko. 2010. Seventy- year record of changes in the composition of overstory species by elevation on the Bartlett Experimental Forest. Res. Pap. NRS-13. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Nortthern Research Station. 12 p.

Yamasaki, Mariko 2006. Wildlife assessments at the Bartlett Experimental Forest. In: Irland, Lloyd C.; Camp, Ann E.; Brissette, John C.; and Donohew, Zachary R., eds. Long-term Silvicultural & Ecological Studies: Results for Science and Management. New Haven, CT: Yale University: 34-36

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.

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.

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

Name	Description	Identification Code
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	Presence/absence of a pathogen in a single mosquito sample (pool)	NEON.DOM.SITE.DP1.10041

Name	Description	Identification Code
pathogen status		
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