Vegetation structure (DP1.10098.001)

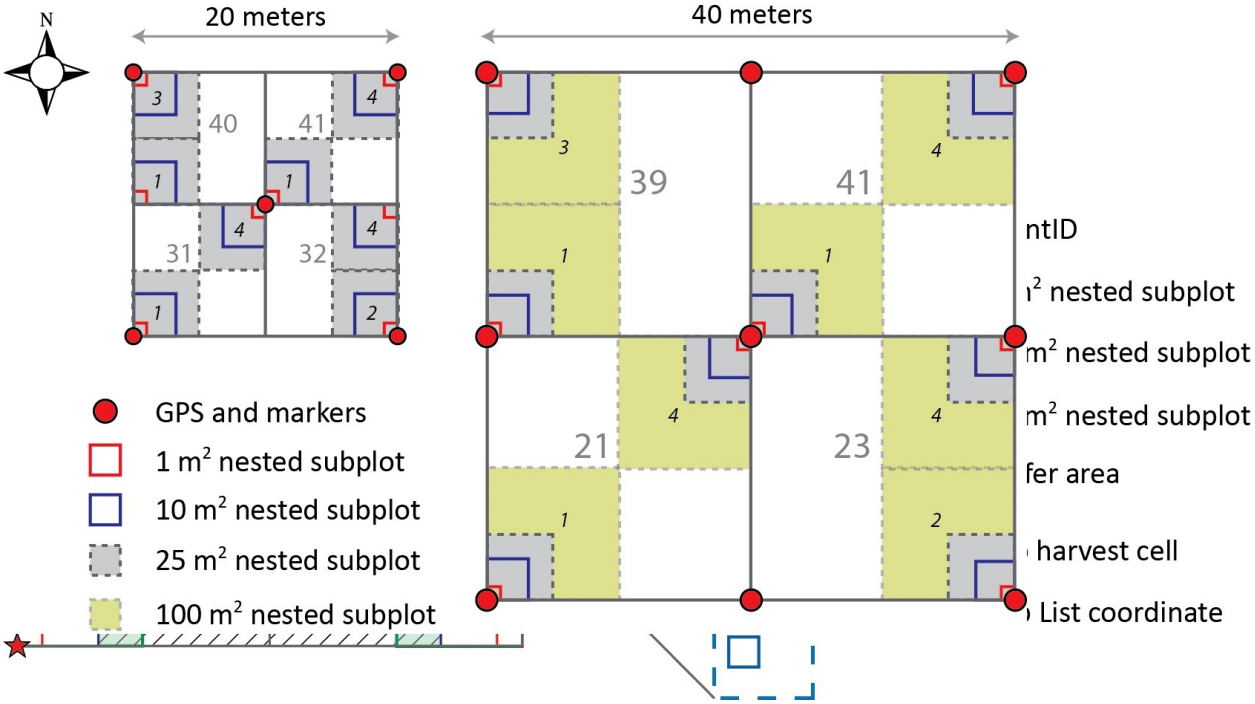
Measurement

Taxonomic identification, state of health, stem diameter, height, crown dimensions, and mapped locations of woody vegetation.

Collection methodology

Taxonomic identification, stem diameter, height, crown dimensions, observations of plant health and mapped location information and other measurements are recorded to enable estimation of biomass and production at multiple scales according to established allometries for the growth forms present across the NEON observatory. Data are collected with hand-held tools in the field, using standardized methods adopted from the forestry community. The temporal strategy is plot dependent; tower plots are measured annually and overlap with instrument based measurement of productivity from the surface-atmosphere exchange system, while distributed plots are measured less frequently and provide a biomass snapshot across all vegetation types within a given NEON site.

For information about disturbances, land management activities, and other incidents that may impact data at NEON sites, see the Site management and event reporting (DP1.10111.001) data product.



20 m x 20 m Distributed/Gradient/Tower base plot (left), a 40 m x 40 m Tower base plot (right), and

associated nested subplots used for measuring woody stem vegetation. Locations of subplots are denoted with plain text numbers, and locations of nested subplots are denoted with italic numbers

Data package contents

vst_shrubgroup: Biomass and productivity measurements of groups of shrubs
vst_apparentindividual: Biomass and productivity measurements of woody individuals
vst_non-woody: Biomass and productivity measurements of non-herbaceous perennial plants (e.g. cacti, ferns)
vst_perplotperyear: Per plot sampling metadata, including presence/absence of each growthForm
vst_mappingandtagging: Mapping, identifying and tagging of individual stems for remeasurement
variables: Description and units for each column of data in data tables
readme: Data product description, issue log, and other metadata about the data product
validation: Description of data validation applied at the points of collection and ingest

Data quality

The identificationQualifier field indicates uncertainty in taxonomic identification, and the taxonRank field indicates the specificity of the identification. For individuals monitored via dendrometer bands, the dendrometerCondition field indicates any problems with the band at the time of data collection.

For analyses that rely on precise geolocation of individuals, the coordinateUncertainty field in the vst_mappingandtagging table contains the uncertainty at the plot level; ie, it reflects that each measurement was made somewhere within the plot. To calculate the location and uncertainty for each mapped individual, follow the instructions in the User Guide, or use the geoNEON R package to perform the calculations. https://github.com/NEONScience/NEON-geolocation

Standard calculations

For wrapper functions to download data from the API, and functions to merge tabular data files across sites and months, see the neonUtilities R package.

Woody vegetation measurements are designed for use in estimating plant biomass and production at NEON sites. Published allometries for plant biomass as it relates to height, stem diameter, and other measurements should be used to make these estimates.

To extrapolate from individual plants to the site level, adjustment should be made for the distribution of measured plants across the site as whole. The nlcdClass field in the vst_perplotperyear table indicates the National Land Cover Database class of each plot, and the vst_perplotperyear table also contains the results of the annual survey of candidate plots to determine the presence or absence of relevant plant types in each plot.

Other data products measuring components of biomass and productivity include Non-herbaceous perennial vegetation structure (DP1.10045.001), Litterfall and fine woody debris (NEON.DP1.10033), herbaceous clip harvest (NEON.DP1.10023), coarse downed wood log surveys (NEON.DP1.10010), and coarse downed wood bulk density (NEON.DP1.10014).

Woody vegetation measurements can also be used as ground references for NEON remote sensing data. To calculate the location of each mapped individual, follow the instructions in the User Guide, or use the geoNEON R package to perform the calculations. https://github.com/NEONScience/NEON-geolocation

Table joining

Table 1	Table 2	Join by field(s)
vst_perplotperyear	vst_mappingandtagging	Join not recommended: vst_perplotperyear and vst_mappingand tagging represent different temporal resolution
vst_mappingandtagging	vst_apparentindividual	individualID
vst_perplotperyear	vst_apparentindividual	Join not recommended: vst_perplotperyear provides annual metadata at the plot level
vst_shrubgroup	vst_perplotperyear	Join not recommended: vst_perplotperyear provides annual metadata at the plot level
vst_shrubgroup	vst_apparentindividual	Join not recommended: vst_shrubgroup and vst_apparentindividual represent non-overlapping sets of plants
vst_mappingandtagging	vst_shrubgroup	Join not recommended: shrubs are not mapped
vst_shrubgroup	vst_non-woody	Join not recommended: vst_shrubgroup and vst_non-woody represent non-overlapping sets of plants

Table 1	Table 2	Join by field(s)
vst_non-woody	vst_perplotperyear	Join not recommended: vst_perplotperyear provides annual metadata at the plot level
vst_non-woody	vst_apparentindividual	Join not recommended: vst_non-woody and vst_apparentindividual represent non-overlapping sets of plants
vst_mappingandtagging	vst_non-woody	individualID

Documentation

TOS Science Design for Plant Biomass and Productivity
NEON.DOC.000914vC | 2.9 MiB | PDF

TOS Protocol and Procedure: VST – Measurement of Vegetation Structure
NEON.DOC.000987vK | 4.8 MiB | PDF

NEON User Guide to Woody Plant Vegetation Structure (NEON.DP1.10098) and Non-herbaceous Perennial Vegetation Structure (NEON.DP1.10045)
NEON_vegStructure_userGuide_vC | 1.1 MiB | PDF

For more information on data product documentation, see:
https://data.neonscience.org/data-products/DP1.10098.001

Citation

To cite data from Vegetation structure (DP1.10098.001), see citation here:
https://data.neonscience.org/data-products/DP1.10098.001
For general guidance in citing NEON data and documentation, see the citation guidelines page:
https://www.neonscience.org/data-samples/guidelines-policies/citing