

EDI Metadata Template (2020)¹

Data should be in csv text file. If starting with an Excel spreadsheet, please make sure it does not contain any formulas and comments on cells. If you need comments put them in their own column. If data were used in a database and major table linking is necessary to analyze, please de-normalize into a flat file, not just database table exports.

Dataset Title

Stem maps of eight 1 ha forest plots distributed around Ann Arbor – MI (AnnArbor: four plots) and around the University of Michigan Biological Station (UMBS: four plots).

Short name or nickname you use to refer to this dataset:

Stem maps.

Abstract

(include what, why, where, when, and how)

In this project we established a network of forest inventory plots to gather the data needed to forecast future forest performance under global change. Data collected from forest inventory plots, i.e., size and location of individual trees from all ages and species, have been shown to be particularly useful to link tree species demographic rates (survival, growth, age at maturity, fecundity) with community characteristics (assemblages and species turnovers), and are also widely used to estimate biomass removal (logging) and biomass production (carbon sequestration).

An added strength of monitoring a network of Forest Plots, not just one stand, is that the same methods are used in data collection across sites, allowing researches to make comparisons along large geographic areas, to detect large-scale trends and to make inferences of species performance under a wide array of environmental conditions. In particular, networks facilitate: *i*) the detailed study of forest growth, mortality, and recruitment in a changing climate along extensive areas and forest types; *ii*) assessments of carbon movement through forest ecosystems and the interface between terrestrial systems and the atmosphere; *iii*) informing earth systems models of climate and terrestrial biomes; *iv*) recreating past, current, and future patterns of forest biodiversity, phenology, invasions, and biogeochemical cycling; and *v*) fostering collaborative research funded through national and international funding programs.

Investigators

(list in order as for a paper with e-mail addresses, organization and preferably ORCID ID, if you don't have one, get it, it's easy and free: <http://orcid.org/>) add table rows as needed

First Name	Middle Initial	Last Name	Organization	e-mail address	ORCID ID (optional)
Inés		Ibáñez	University of Michigan	iibanez@umich.edu	0000-0002-1054-0727

¹ This document liberally borrows from similar documents at SBC and GCE

Other personnel names and roles

(dataset creators & contact, field crew, data entry etc. with e-mail addresses, organization and ORCID ID)

First Name	Middle Initial	Last Name	Organization	e-mail address	ORCID ID (optional)	Role in project

License

(Select a license for release of your data. We have 2 recommendations: [CCO – most accommodating of data reuse](#), & [CCBY – requires attribution](#))

CCO

Keywords

(List keywords and separate with commas. Using keywords from a controlled vocabulary (CV) will improve the future discovery and reuse of your data. The LTER CV is effective at describing ecological and environmental data. [Access the LTER CV here](#). [Try this text mining service to extract LTER CV keywords from your abstract or methods](#). Additionally, please determine one or two keywords that best describe your lab, station, and/or project (e.g., Trout Lake Station, NTL LTER). This will help others discover your data by site/project).

Stem maps, UMBS, Ann Arbor, Michigan, tree, dbh, temperate

Funding of this work:

Add rows to table if several grants were involved, list only the main PI, start with main grant first:

PI First Name	PI Middle Initial	PI Last Name	PI ORCID ID (optional)	Title of Grant	Funding Agency	Funding Identification Number
Inés		Ibáñez	0000-0002-1054-0727	Associate professor	USDA McIntire Stennis project	F045405
Inés		Ibáñez	0000-0002-1054-0727	Associate professor	NSF	DEB 1252664

Timeframe

- Begin date
June 2017
- End date
On going
- Data collection ongoing/completed
First census completed July 2018

Geographic location

Verbal description:

- Northern Michigan Sites:
 - University of Michigan Biological Station (UMBS): 10,000-acre reforested property in northern Michigan with several sites, Cheboygan County, Pellston, MI
 - Aspen site: originally populated with aspens (*Populus* sp.)
 - Balsam Woods site: originally populated with balsam (*Abies* sp.)
 - Pine-Aspen site: originally populated mixed pines-aspens (*Pinus* – *Abies* sp.)
 - Northern Hardwoods site: originally populated with mixed coniferous and deciduous tree species
- Ann Arbor Sites:
 - Edwin S. George Reserve: 1300-acre fenced preserve 25 miles northwest of Ann Arbor maintained by the University of Michigan. Livingston County, Pinkney, MI
 - ESGRdry: dry site, mixed tree species
 - ESGRwet: wet site, mixed tree species
 - Radrick: Radrick Farms Golf Course (co-managed by University of Michigan School for Environment and Sustainability researchers and Golf Course staff) containing 100 acres of forest in Washtenaw County, Ann Arbor, MI
 - Stinchfield: Stinchfield Woods containing 777 acres of mixed hardwoods forest in Washtenaw County, Pinckney, MI

Northern Michigan Plots Projected Coordinate Systems:

- State Plane
 - NAD 1983 (2011) (Meters)
 - NAD_1983_2011_StatePlane_Michigan_Central_FIPS_2112
 - Southeast Corner Latitude/Longitude
 - Aspen: 45.5520556 °N, -84.7125 °W
 - Balsam Fir: 45.54541667 °N, -84.66583333 °W
 - Northern Hardwoods: 45.5673056 °N, -84.681667 °W
 - Pine Aspen: 45.5551389 °N, -84.7475 °W

Southern Michigan Plots Data Projected Coordinate Systems:

- State Plane
 - NAD 1983 (2011) (Meters)
 - NAD_1983_2011_StatePlane_Michigan_South_FIPS_2113
 - Southeast Corner Latitude/Longitude
 - ESGRdry: 42.45818 °N, -84.01123 °W
 - ESGRwet: 42.45641 °N, -84.02054 °W
 - Radrick: 42.28738 °N, -83.65851 °W

- Stinchfield: 42.399347 °N, -83.925797 °W

Taxonomic species or groups

Abba = *Abies balsamea*
 Acni = *Acer nigrum*
 Acpe = *Acer pensylvanicum*
 Acpl = *Acer platanoides*
 Acru = *Acer rubrum*
 Acsa = *Acer saccharum*
 Acsp = *Acer spicatum*
 Amar = *Amelanchier arborea*
 Amspp. = *Amelanchier* sp.
 Beal = *Betula alleghaniensis*
 Bepa = *Betula papyrifera*
 Besp = *Betula* sp.
 Caca = *Carpinus caroliniana*
 Cagl = *Carya glabra*
 Caov = *Carya ovata*
 Coco = *Corylus cornuta*
 Cofl = *Cornus florida*
 Fagr = *Fagus grandifolia*
 Fram = *Fraxinus americana*
 Frni = *Fraxinus nigra*
 Juvi = *Juniperus virginiana*
 Osvi = *Ostrya virginiana*
 Piba = *Pinus banksiana*
 Pigl = *Picea glauca*
 Pire = *Pinus resinosa*
 Pist = *Pinus strobus*
 Pogr = *Populus grandidentata*
 Potr = *Populus tremuloides*
 Prse = *Prunus serotina*
 Prvi = *Prunus virginiana*
 Qual = *Quercus alba*
 Quru = *Quercus rubrum*
 Quve = *Quercus velutina*
 Rhca = *Rhamnus cathartica*
 Saal = *Sassafras albidum*
 Salix spp = *Salix* sp.
 Thoc = *Thuja occidentalis*
 Tiam = *Tilia americana*
 Tsca = *Tsuga canadensis*
 Ulam = *Ulmus americana*
 Viac = *Viburnum acerificifolium*

Methods

(please be specific, include instrument descriptions, or point to a protocol online, if this is a data compilation please specify datasets used, preferably their DOI or URL plus general citation information)

We established forest plots within the University of Michigan properties at two locations, Ann Arbor, SE Michigan, and University of Michigan Biological Station (UMBS), northern Michigan lower peninsula. We established 1 ha (100 x 100m) plots in each of the selected forest stands, four at each location. At each forest plot we set up a 10x10 m grid marked by pvc poles at each intersection delimiting 100 m² quadrats which were numbered to facilitate the tree census. Elevation at each node of the grid was recorded to generate high-resolution topographic maps of the plots. We used surveying and GPS equipment. In each hectare plot we tagged (with unique numbered tags), identified and measured tree diameter at breast height (dbh, 1.37 m) using tapes or calipers. all trees with at least a dbh of 1 cm were included. Tags were placed at the point-of-measured (POM, 1.37 m) for consistent measurements in further censuses, for small trees POM was marked with tree paint. Trees with several stems at 1.37 m height were marked accordingly and measured. Location in the plot of each tree was recorded.

Data Table

- Column name: exactly as it appears in the dataset. Please avoid special characters, dashes and spaces.
- Description: please be specific, it can be lengthy
- Unit: please avoid special characters and describe units in this pattern: e.g. microSiemenPerCentimeter, microgramsPerLiter, absoptionPerMolePerCentimeter
- Code explanation: if you use codes in your column, please explain in this way: e.g. LR=Little Rock Lake, A=Sample suspect, J=Nonstandard routine followed
- Data format: please tell us exactly how the date and time is formatted: e.g. mm/dd/yyyy hh:mm:ss plus the time zone and whether or not daylight savings was observed.
- If a code for 'no data' is used, please specify: e.g. -99999

Please add rows as needed

Table description: Add a description for each table

Column name	Description	Unit or code explanation or date format	Empty value code
location	Region of Michigan from which data was collected, either University of Michigan Biological Station (UMBS) or Ann Arbor (AnnArbor)	AnnArbor UMBS	
site	Plot designation identifies Michigan forest location of plot	ESGRdry ESGRwet Radrick Stinchfield Aspen Balsam NHW Pine-Aspen	
species	Four-letter code for genus and species of tree	see table for species codes	

tag	Tree identification number within the plot, starts at 1 at each site		
treeID	Tree identification number is a combination of the plot location and the individual tree, making a unique tree identification within the study		
year	year of data collection	2017 2018	
diameter	DBH: diameter at breast height (1.35 m), marked with identifying tag or paint	centimeters	
xplot	distance West of SE corner of plot, which is also grid origin 0,0. Negative number for plotting on coordinate plane.	meters	
yplot	distance to 0,0 or distance to SE corner of the 10x10 grid, always positive	meters	
latitude	actual latitude	meters	
longitude	actual longitude	meters	
elev	elevation from "Add surface information" tool in 3D analyst	meters	

Articles

(List articles citing this dataset)

Article DOI or URL (DOI is preferred)	Article title	Journal title

Scripts/code (software)

(List any software scripts/code you would like to archive along with your data. These may include processing scripts you wrote to create, clean, or analyze the data.)

File name	Description	Scripting language
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Data provenance

(Were these data derived from other data? If so, you will want to document this information so users know where these data come from.)

Dataset title	Dataset DOI or URL	Creator (name & email)	Contact (name & email)

Notes and Comments