

Metadata

Dataset Title:

Cary_Forest_Plots_1984_Plot_Description.csv

Cary Institute of Ecosystem Studies, Cary Forest Plot Data Description

Abstract

This dataset is a contribution to the Cary Institute of Ecosystem Studies. The Cary Forest Plots were established in 1984 as part of The Cary Vegetation Study, which described the vegetation of the then Cary Arboretum. The project established 76 permanent plots referred to as the "Cary Forest Plots". Data collection in the plots was extensive and included a survey of mature trees, saplings, seedlings, shrubs and herbaceous species as well as soil analyses, tree ring data and physical descriptions of each plot. Subsequent re-surveys of the plots were done in 20 of the 76 original plots as part of the Forest Response to Stress and Damage (FORSTAD) project, which took place over approximately 10 years in the 1990's. These surveys included an annual canopy census of trees. Canopy census data were also collected in other plots studied in the FORSTAD project, including Nutrient Cycling Plots A & B and in the control plots in the Yellow, Teahouse grid and the Red, Henry Grid. Another resurvey of 43 of the Cary Forest Plots was done in 2006 by Dan Katz as part of his Research Experience for Undergraduates (REU) project and his senior thesis project at Bard College. His surveys included mature trees, saplings, seedlings, shrubs and herbaceous species as well as soil analyses. This repository includes Cary Forest Plot data from the 1984 Cary Vegetation Study.

Publications:

GLITZENSTEIN, J. S., C. D. CANHAM, M. J. MCDONNELL, AND D. R. STRENG. 1990. Effects of environment and land-use history on upland forests of the Cary Arboretum, Hudson Valley, New York. *Bull. Torrey Bot. Club* 117: 106–122.

Katz, D.S.W., Lovett, G.M., Canham, C.D., & O'Reilly, C.M. 2010. Legacies of land use history diminish over 22 years in a forest in southeastern New York. *Journal of the Torrey Botanical Society* 137: 236–251.

Data provided in this dataset include latitude and longitude for each site, physical descriptions of the sites, date sampled, and locations of any quadrats or quadrants sampled.

The Cary Institute of Ecosystem Studies furnishes data under the following conditions: The data have received quality assurance scrutiny, and, although we are confident of the accuracy of these data, Cary Institute will not be held liable for errors in these data. Data are subject to change resulting from updates in data screening or models used. Data citation: Please click on the Cite button on the Figshare repository.

Those wishing to publish data from Cary Institute of Ecosystem Studies, Cary Forest Plots are encouraged to contact the data manager at datamanagement@caryinstitute.org.

Investigators

First Name	Middle Initial	Last Name	Organization	e-mail address	ORCID ID
Charles	D	Canham	Cary Institute of Ecosystem Studies	canhamc@caryinstitute.org	0000-0001-8361-9148
Mark	J	McDonnell	The University of Melbourne	markmc@unimelb.edu.au	0000-0002-7937-6566
Daniel		Spada			
Carolyn		Wilczynski			

Keywords

Cary Institute, Cary Institute of Ecosystem Studies, data, hardwood forest, tree inventory, land-use history, vegetation survey

Timeframe

1984

Geographic location

The Cary Institute of Ecosystem Studies is located in Millbrook, NY USA.

Methods

The sampling of Cary Forest Plots was done by two field assistants in 8 weeks in the summer of 1984. The size of each plot was deliberately small (500 m^2 , $1/20$ of a hectare) because of the apparent heterogeneity of site conditions within the Cary Arboretum. At this intensity of sampling, there was one plot for every 3 adjacent grid squares that were entirely within the contiguous forest areas of the Cary Arboretum. Note that a grid system consisting of 1 ha grid squares was established on the Cary Arboretum prior to this project. Each grid square was numbered and corners posted with fiberglass stakes and metal tags.

STAND LOCATIONS - Stands were located at predetermined, random distances along transects that ran parallel to grid square lines, midway between grid lines. Under certain conditions, the location of a stand was adjusted because of field conditions, specifically where continuous forest cover was interrupted by: streams, paved or forest roads, or fields. When the edge of a stand extended within 20 m of one of the features listed above, the center of the stand was moved back along the transect until the edge of the stand was 20 m away from the forest edge created by the feature. The new location of the stand (distance along the transect) was recorded on the data sheet for the stand. Stand locations were altered because of temporary pools (e.g. standing water in local depressions that were not part of an open drainage system).

STAND LAYOUT - Each stand consisted of a circular 500 m^2 plot (radius 12.62 m) centered at the predetermined location along a transect running midway between grid lines. Within this plot, a variety of smaller quadrats were used to sample specific components of the vegetation and environment of the site.

SAMPLING PROCEDURE Trees: The DBH and crown class of all stems greater than 10 cm DBH (1. m above the ground) in the 500 m^2 plot were recorded by species. Four crown classes were recognized: C = Canopy: trees with greater than 25% of crown cross-sectional area exposed to the sky, SC = Sub-canopy: trees with less than 25% of crown area exposed to the sky, U = Understory: trees whose crowns were entirely overtopped by adjacent canopy and sub-canopy trees, and D = Standing Dead: for standing dead trees. Saplings: Sapling density was recorded in two of the four quadrants of the main circular plot. The two quadrants were randomly chosen. The numbers of all tree stems greater than 1 m height but less than 10 cm DBH were recorded by 2 cm size classes for each species. The size classes were: 1 = 0-2 cm DBH, 3 = 2-4 cm DBH, 5 = 4-6 cm DBH, 7 = 6-8 cm DBH, and 9 = 8-10 cm DBH. The presence of all species of saplings

within the entire 500 m² plot was also recorded.

Shrubs: Shrub abundance was estimated from a line intercept sampling scheme. Shrub cover was recorded along the entire 25.23 m length of the main transect. The presence of all shrub species within the 500 m² plot were also recorded.

Seedlings and Herbaceous Species:

The density of tree seedlings and the cover of herbaceous species were recorded in 8 – 1 m x 0.5 m rectangular quadrats located at random distances along the 25.23 m transect running through the plot. The cover of exposed rocks, bare soil, mosses, lichens and fallen logs were also recorded in each quadrat. A species list of all vascular plants present in the 500 m² plot was also compiled.

Topographic Variables: The following topographic variables were recorded for each stand: Slope, Aspect, Slope Position in one of the following classes: ridge top, crest of slope, mid slope, foot of slope, local depression, and Approximate Elevation: from topographic maps.

Soil Sampling: At 4 randomly chosen distances along the central transect, 10 cm deep soil cores (starting from the top of the mineral soil) were collected using an Oakfield tube sampler and combined in a single sample bag for a composite sample. The depth of the litter layer (L, F and H horizons combined) were also recorded at each of the 4 locations. Samples were analyzed for pH, texture, percent organic matter and chemistry. Note that descriptions of methods were not saved for all analyses.

Stand Structure: The following were recorded for each plot: Maximum Canopy Height: using a clinometer and tape measure to record the height of the tallest tree on the plot, and Crown Closure: as the number of grid intersections of the camera field that were exposed to the sky. The camera was positioned vertically at the center of the plot.

Stand History: The age of the forest stand and the history of disturbance at the site was estimated through a series of types of observations. The presence or absence of mound and pit microtopography was recorded. The largest tree in the stand was cored. If the tree had a hollow core, the next largest tree was also cored (repeating this procedure as necessary to get a complete core). All cores were saved. If a core missed the center of the tree by more than approximately 1 cm, the tree was cored again. The presence of stone walls within the stand were recorded. Evidence of selective logging or other recent disturbance to the canopy was also recorded.

Data Table

Column name	Description	Unit or code explanation or date format	Empty value code
Plot_Number	Plot number, associated with grid square number within which plot was located		blank
Grid_Number	Grid square number from gridded map of Cary Institute		blank
Lat_Decimal	Latitude in decimal units		blank
Lon_Decimal	Longitude in decimal units		blank
Date	Date plot was sampled		blank
Plot_Center_m	Center of the plot at the location along a transect running midway between grid lines	meters	blank
Surveyer1_Initials	DS = Daniel Spada, CW = Carolyn		blank

	Wilczynski		
Surveyer2_Initials	DS = Daniel Spada, CW = Carolyn Wilczynski		blank
Slope_degrees	Angle of slope	Degrees	blank
Aspect_degrees	Direction plot faces	Degrees	blank
Slope_Position1	Plot position along slope		blank
Slope_Position2	Additional plot position along slope		blank
Hydrologic_Features1	Presence of hydrologic features		blank
Hydrologic_Features2	Additional presence of hydrologic features		blank
Crown_Closure	The number of grid intersections of the camera field that were exposed to the sky. The camera was positioned vertically at the center of the plot.		blank
Canopy_Height_m	Height of tallest tree in plot	meters	blank
Prior_History1	Notes regarding potential history of site		blank
Prior_History2	Notes regarding potential history of site		blank
Mounds_Pits	Presence of mounds & pits Y=yes, N=no		blank
Stone_Walls	Presence of stone walls Y=yes, N=no		blank
Litter_Depth_L_Horizon_cm	Depth of L litter horizon	centimeters	blank
Litter_Depth_F_Horizon_cm	Depth of F litter horizon	centimeters	blank
Litter_Depth_H_Horizon_cm	Depth of H litter horizon	centimeters	blank
Soil_Depth_cm	Depth of mineral soil	centimeters	blank
Exposed_Bedrock	Presence of bedrock Y=yes, N=no		blank
Quadrat1_location	Location of quadrat 1 along the 25.23 m transect running through the plot	meters	blank
Quadrat2_location	Location of quadrat 2 along the 25.23 m transect running through the plot	meters	blank
Quadrat3_location	Location of quadrat 3 along the 25.23 m transect running through the plot	meters	blank
Quadrat4_location	Location of quadrat 4 along the 25.23 m transect running through the plot	meters	blank
Quadrat5_location	Location of quadrat 5 along the 25.23 m transect running through the plot	meters	blank
Quadrat6_location	Location of quadrat 6 along the 25.23 m transect running through the plot	meters	blank
Quadrat7_location	Location of quadrat 7 along the 25.23 m transect running through the plot	meters	blank
Quadrat8_location	Location of quadrat 8 along the 25.23 m transect running through	meters	blank

	the plot		
Sapling_Quadrant1	Location of sapling quadrant 1		blank
Sapling_Quadrant2	Location of sapling quadrant 2		blank

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