

## FORSTAD PLOT LOCATIONS

The FORSTAD project took place in the forests at Cary Institute of Ecosystem Studies in the following sites.

### GRIDS

2.25 ha plots labelled Red, Yellow and Green grids, each of which consisted of paired control and experimental plots. Monitoring included small mammal trapping, vegetation monitoring, spongy moth monitoring.

### CARY FOREST PLOTS

FORSTAD utilized 20 of the 77 Cary Forest Plots, which were circular 500 m<sup>2</sup> plots (radius 12.62 m) established in 1984 for forest monitoring purposes. Monitoring included vegetation measurements.

### SPONGY MOTH TEAHOUSE HILL PLOTS

A series of twenty, 75 m<sup>2</sup> plots on Teahouse Hill were sampled for annual egg mass densities (1981-2005); defoliation occurred in 1981, 1989, 1990, and 1991. Species and stem diameter of all woody vegetation over 10 cm in height were recorded at the time plots were established and periodically during the project. Canopy photos were taken more or less annually.

### SPONGY MOTH NORTH CANOE HILL TREES

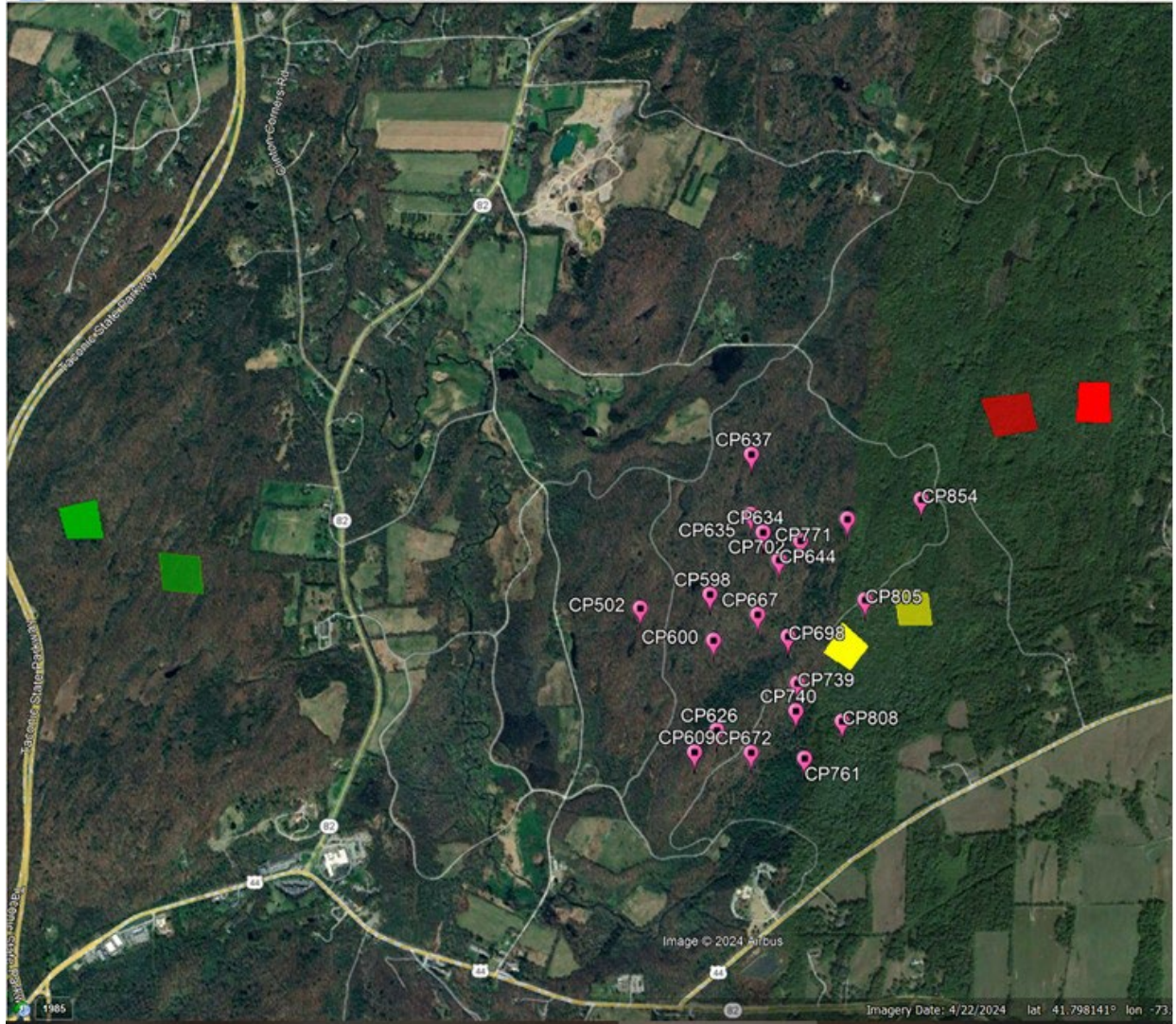
In a 16 ha area on the North Canoe Hill, 200 randomly located chestnut oaks (*Quercus prinus*). Half of these trees had burlap bands placed at DBH (1.3 m) to facilitate counting gypsy moths at low densities. Spongy moth larvae, pupae, and egg masses aggregate under bands because the insects seek sheltered refuges when not actively feeding. Managers and homeowners used this technique for many years, and a prior USFS-funded project examined the densities under bands to densities in the rest of the forest; this was continued during the FORSTAD project.

### NUTRIENT CYCLING PLOTS

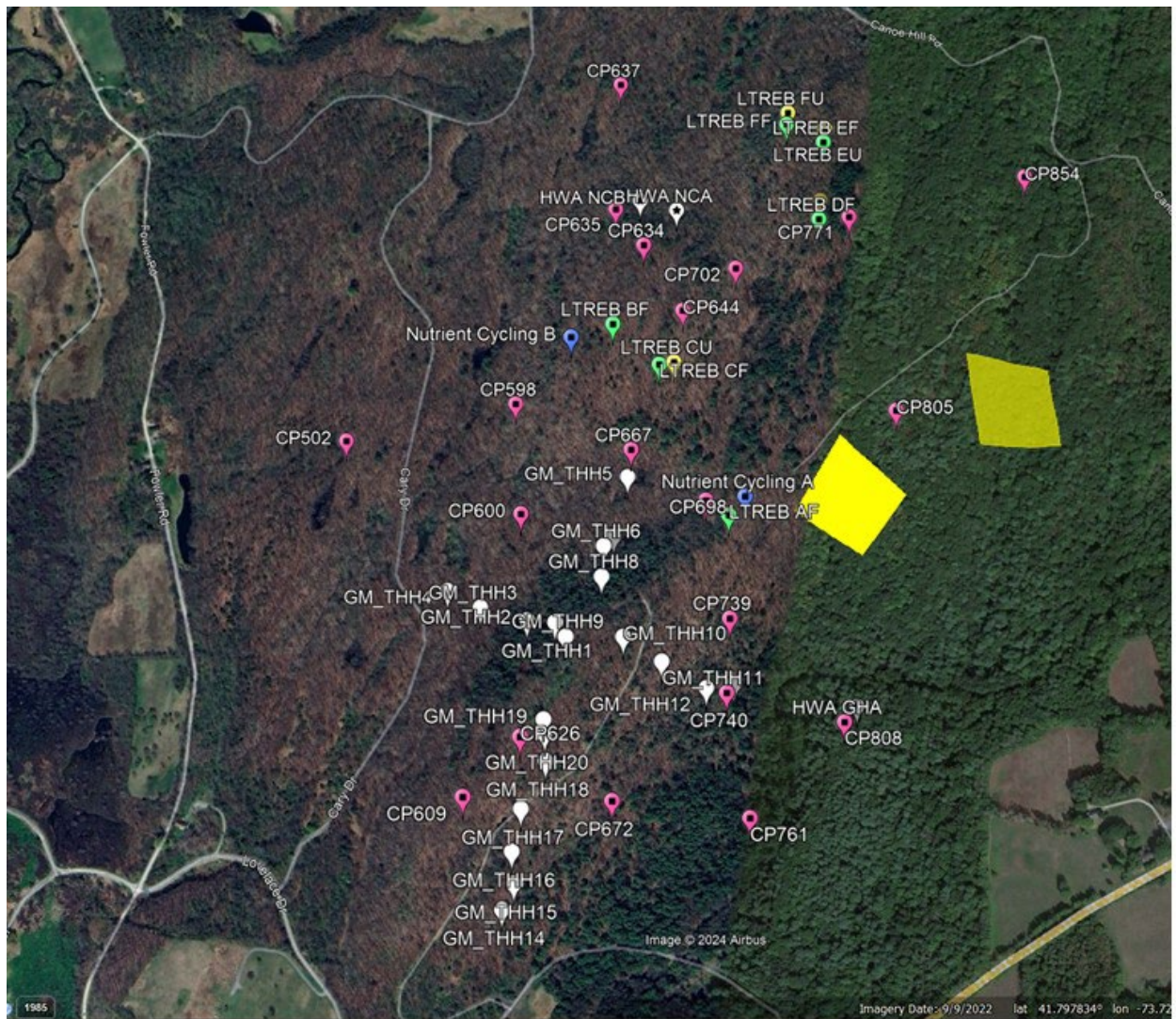
In 1992 two 15m x15m nutrient cycling plots were established in the Canoe Hills area called Nutrient\_Cycling\_A & Nutrient\_Cycling\_B. Monitoring included throughfall and soil solution chemistry, foliar nitrogen concentration, N mineralization rates, and litterfall amount and N content. There was particular interest in the effects of air pollutant nitrogen oxides and spongy moth outbreaks on the nitrogen cycle in forests. This project was followed by a NSF LTREB-funded project that added plots and used these two plots for controls in a fertilization experiment.

### HEMLOCK WOOLY ADELGID PLOTS

Plots near Gifford House and on Canoe Hill that were 15 m x 15 m to monitor HWA. These were referred to as HWA\_GHA, HWA\_GHB, HWA\_NCA & HWA\_NCB.







FORSTAD_Subproject	Site	Latitude_Decimal_Degrees	Longitude_Decimal_Degrees	Size	Notes
Nutrient_Cycling	FORSTAD_A	41.79340	-73.73307	15x15 m	also known as Nutrient Cycling (NC) Plot A. Plot was used in LTREB project (1996-2014) Unfertilized/Control
Nutrient_Cycling	LTREB_AF	41.79309	-73.73333	15x15 m	LTREB=Long Term Research in Environmental Biology Plot A Fertilized
Nutrient_Cycling	FORSTAD_B	41.79535	-73.73691	15x15 m	also known as Nutrient Cycling (NC) Plot B. Plot was used in LTREB project (1996-2014) Unfertilized/Control
Nutrient_Cycling	LTREB_BF	41.79560	-73.73612	15x15 m	LTREB=Long Term Research in Environmental Biology Plot B Fertilized
Nutrient_Cycling	LTREB_CF	41.79513	-73.73511	circular with a 10-m radius	LTREB=Long Term Research in Environmental Biology Plot C Fertilized
Nutrient_Cycling	LTREB_CU	41.79519	-73.73483	circular with a 10-m radius	LTREB=Long Term Research in Environmental Biology Plot C Unfertilized
Nutrient_Cycling	LTREB_DF	41.79765	-73.73242	circular with a 10-m radius	LTREB=Long Term Research in Environmental Biology Plot D Fertilized
Nutrient_Cycling	LTREB_DU	41.79794	-73.73245	circular with a 10-m radius	LTREB=Long Term Research in Environmental Biology Plot D Unfertilized
Nutrient_Cycling	LTREB_EF	41.79885	-73.73255	circular with a 10-m radius	LTREB=Long Term Research in Environmental Biology Plot E Fertilized
Nutrient_Cycling	LTREB_EU	41.79908	-73.73256	circular with a 10-m radius	LTREB=Long Term Research in Environmental Biology Plot E Unfertilized
Nutrient_Cycling	LTREB_FF	41.79909	-73.73333	circular with a 10-m radius	LTREB=Long Term Research in Environmental Biology Plot F Fertilized
Nutrient_Cycling	LTREB_FU	41.79929	-73.73334	circular with a 10-m radius	LTREB=Long Term Research in Environmental Biology Plot F Unfertilized
Hemlock_Wooly_Adelgid	HWA_GHA	41.79043	-73.73052	15x15 m	Hemlock Wooly Adelgid, Gifford House Plot A
Hemlock_Wooly_Adelgid	HWA_GHB	41.79068	-73.73032	15x15 m	Hemlock Wooly Adelgid, Gifford House Plot B
Hemlock_Wooly_Adelgid	HWA_NCA	41.79753	-73.73526	15x15 m	Hemlock Wooly Adelgid, North Canoo Hill Plot A
Hemlock_Wooly_Adelgid	HWA_NCB	41.79762	-73.73602	15x15 m	Hemlock Wooly Adelgid, North Canoo Hill Plot B
Hemlock_Decline_Plots	SOL	41.79076	-73.73461	15x15 m	Side of Tea House Hill
Hemlock_Decline_Plots	THOL	41.79107	-73.73633	15x15 m	Tea House Over Look
Cary_Forest_Plots	CP502	41.79344	-73.74114	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 502
Cary_Forest_Plots	CP598	41.79433	-73.73786	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 598
Cary_Forest_Plots	CP600	41.79270	-73.73736	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 600
Cary_Forest_Plots	CP605	41.78862	-73.73747	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 605
Cary_Forest_Plots	CP626	41.78956	-73.73656	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 626
Cary_Forest_Plots	CP634	41.79685	-73.73577	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 634
Cary_Forest_Plots	CP635	41.79742	-73.73647	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 635
Cary_Forest_Plots	CP637	41.79959	-73.73687	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 637
Cary_Forest_Plots	CP664	41.79596	-73.73481	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 664
Cary_Forest_Plots	CP667	41.79387	-73.73542	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 667
Cary_Forest_Plots	CP672	41.78885	-73.73473	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 672
Cary_Forest_Plots	CP698	41.79326	-73.73381	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 698
Cary_Forest_Plots	CP702	41.79675	-73.73391	circular 500 m <sup>2</sup> plot (radius 12.62 m)	Cary Forest Plot 702

Cary_Forest_Plots	CP739	41.79163	-73.73302	circular 500 m^2 plot (radius 12.62 m)	Cary Forest Plot 739
Cary_Forest_Plots	CP740	41.79059	-73.73287	circular 500 m^2 plot (radius 12.62 m)	Cary Forest Plot 740
Cary_Forest_Plots	CP761	41.78889	-73.73208	circular 500 m^2 plot (radius 12.62 m)	Cary Forest Plot 761
Cary_Forest_Plots	CP771	41.79777	-73.73183	circular 500 m^2 plot (radius 12.62 m)	Cary Forest Plot 771
Cary_Forest_Plots	CP805	41.79498	-73.73039	circular 500 m^2 plot (radius 12.62 m)	Cary Forest Plot 805
Cary_Forest_Plots	CP808	41.79043	-73.73052	circular 500 m^2 plot (radius 12.62 m)	Cary Forest Plot 808
Cary_Forest_Plots	CP854	41.79887	-73.72841	circular 500 m^2 plot (radius 12.62 m)	Cary Forest Plot 854
Spongy_Moth_Teahouse_Hill_Plots	THH1	41.79119	-73.73627	square 78.54 m^2	Tea House Hill Plot 1
Spongy_Moth_Teahouse_Hill_Plots	THH2	41.79117	-73.73683	square 78.54 m^2	Tea House Hill Plot 2
Spongy_Moth_Teahouse_Hill_Plots	THH3	41.79127	-73.73783	square 78.54 m^2	Tea House Hill Plot 3
Spongy_Moth_Teahouse_Hill_Plots	THH4	41.79144	-73.73853	square 78.54 m^2	Tea House Hill Plot 4
Spongy_Moth_Teahouse_Hill_Plots	THH5	41.79346	-73.73540	square 78.54 m^2	Tea House Hill Plot 5
Spongy_Moth_Teahouse_Hill_Plots	THH6	41.79238	-73.73562	square 78.54 m^2	Tea House Hill Plot 6
Spongy_Moth_Teahouse_Hill_Plots	THH7	41.79254	-73.73546	square 78.54 m^2	Tea House Hill Plot 7
Spongy_Moth_Teahouse_Hill_Plots	THH8	41.79193	-73.73555	square 78.54 m^2	Tea House Hill Plot 8
Spongy_Moth_Teahouse_Hill_Plots	THH9	41.79101	-73.73601	square 78.54 m^2	Tea House Hill Plot 9
Spongy_Moth_Teahouse_Hill_Plots	THH10	41.79113	-73.73495	square 78.54 m^2	Tea House Hill Plot 10
Spongy_Moth_Teahouse_Hill_Plots	THH11	41.79088	-73.73418	square 78.54 m^2	Tea House Hill Plot 11
Spongy_Moth_Teahouse_Hill_Plots	THH12	41.79061	-73.73327	square 78.54 m^2	Tea House Hill Plot 12
Spongy_Moth_Teahouse_Hill_Plots	THH13	41.79072	-73.73276	square 78.54 m^2	Tea House Hill Plot 13
Spongy_Moth_Teahouse_Hill_Plots	THH14	41.78715	-73.73646	square 78.54 m^2	Tea House Hill Plot 14
Spongy_Moth_Teahouse_Hill_Plots	THH15	41.78753	-73.73631	square 78.54 m^2	Tea House Hill Plot 15
Spongy_Moth_Teahouse_Hill_Plots	THH16	41.78797	-73.73643	square 78.54 m^2	Tea House Hill Plot 16
Spongy_Moth_Teahouse_Hill_Plots	THH17	41.78857	-73.73638	square 78.54 m^2	Tea House Hill Plot 17
Spongy_Moth_Teahouse_Hill_Plots	THH18	41.78928	-73.73604	square 78.54 m^2	Tea House Hill Plot 18
Spongy_Moth_Teahouse_Hill_Plots	THH19	41.78984	-73.73618	square 78.54 m^2	Tea House Hill Plot 19
Spongy_Moth_Teahouse_Hill_Plots	THH20	41.78965	-73.73612	square 78.54 m^2	Tea House Hill Plot 20
FORSTAD_Grids	GC_A1	41.79376	-73.76773	square 2.25 ha	Green Grid Control Plot Corner A1
FORSTAD_Grids	GC_A11	41.79353	-73.76939	square 2.25 ha	Green Grid Control Plot Corner A11
FORSTAD_Grids	GC_K11	41.79456	-73.76998	square 2.25 ha	Green Grid Control Plot Corner K11
FORSTAD_Grids	GC_K1	41.79510	-73.76826	square 2.25 ha	Green Grid Control Plot Corner K11
FORSTAD_Grids	GE_A1	41.79359	-73.76298	square 2.25 ha	Green Grid Experimental Plot Corner A1. 'Experiments' included the addition of acorns in autumn 1995 to study the effects of acorn abundance on mouse populations and removal of mice and/or chipmunks in 1995, 1997 and 1998 to study their predation on spongy moth pupae.
FORSTAD_Grids	GE_A11	41.79228	-73.76257	square 2.25 ha	Green Grid Experimental Plot Corner A11
FORSTAD_Grids	GE_K11	41.79219	-73.76452	square 2.25 ha	Green Grid Experimental Plot Corner K11
FORSTAD_Grids	GE_K1	41.79350	-73.76502	square 2.25 ha	Green Grid Experimental Plot Corner K11
FORSTAD_Grids	RC_A1	41.80316	-73.72164	square 2.25 ha	Red Grid Control Plot Corner A1
FORSTAD_Grids	RC_A11	41.80458	-73.72181	square 2.25 ha	Red Grid Control Plot Corner A11

FORSTAD_Grids	RC_K11	41.80471	-73.72046	square 2.25 ha	Red Grid Control Plot Corner K11
FORSTAD_Grids	RC_K1	41.80335	-73.72005	square 2.25 ha	Red Grid Control Plot Corner K11
FORSTAD_Grids	RE_A1	41.80222	-73.72545	square 2.25 ha	Red Grid Experimental Plot Corner A1. 'Experiments' included the addition of acorns in autumn 1995 to study the effects of acorn abundance on mouse populations and removal of mice and/or chipmunks in 1995, 1997 and 1998 to study their predation on spongy moth pupae.
FORSTAD_Grids	RE_A10	41.80349	-73.72641	square 2.25 ha	Red Grid Experimental Plot Corner A11
FORSTAD_Grids	RE_L10	41.80385	-73.72425	square 2.25 ha	Red Grid Experimental Plot Corner K11
FORSTAD_Grids	RE_L1	41.80268	-73.72347	square 2.25 ha	Red Grid Experimental Plot Corner K11
FORSTAD_Grids	YC_A1	41.79353	-73.73223	square 2.25 ha	Yellow Grid Control Plot Corner A1
FORSTAD_Grids	YC_A11	41.79480	-73.73152	square 2.25 ha	Yellow Grid Control Plot Corner A11
FORSTAD_Grids	YC_K11	41.79403	-73.73006	square 2.25 ha	Yellow Grid Control Plot Corner K11
FORSTAD_Grids	YC_K1	41.79307	-73.73077	square 2.25 ha	Yellow Grid Control Plot Corner K11
FORSTAD_Grids	YE_A1	41.79619	-73.72926	square 2.25 ha	Yellow Grid Experimental Plot Corner A1. 'Experiments' included the addition of acorns in autumn 1995 to study the effects of acorn abundance on mouse populations and removal of mice and/or chipmunks in 1995, 1997 and 1998 to study their predation on spongy moth pupae.
FORSTAD_Grids	YE_A11	41.79620	-73.72755	square 2.25 ha	Yellow Grid Experimental Plot Corner A11
FORSTAD_Grids	YE_K11	41.79512	-73.72716	square 2.25 ha	Yellow Grid Experimental Plot Corner K11
FORSTAD_Grids	YE_K1	41.79493	-73.72875	square 2.25 ha	Yellow Grid Experimental Plot Corner K11