Hopkins Memorial Forest, Permanent Plot Survey

Ten Williams College students and I started the fourth census of the permanent plot system in the Hopkins Memorial Forest in June, 2010 and a second team of ten students and I will complete the inventory this summer. The project was initiated by the U.S. Forest Service 75 years ago when they established quarter-acre plots in which every woody stem greater than 0.5-inches in diameter has been measured and tallied by species. Several sample trees in each of the plots had a core removed to determine age and radial growth rates. In addition, the shrubs and herbaceous plants were inventoried in 10 plots, each of which is 1/1000-acre in area. Since 1970 the monitoring has been conducted by faculty and students at Williams—in the 1970s, 1990s, and now in the 2010s. The long-term data on tree growth and vegetational changes in an "unmanaged" forested landscape provide a unique database for the interpretation of human impacts (ranging from differential local land-uses to global climate change) on biotic communities.

Long-term Vegetation Survey Crew, Summer 2010.

We are concentrating on the analysis of sample tree core data that shows the radial growth over the last 300 years, a period that spans the industrial age in which both atmospheric CO2 levels and global climate have changed dramatically. We are paying special attention to the diameter growth changes reflected in the census of the permanent plots as we tease-out the legacy effects of past land-uses and successional trends from those of a changing local climate, using the weather data archives of the Hopkins Memorial Forest (http://www.williams.edu/Geoscience/weather/). We are also undertaking an analysis of the relationship between climatic changes and the expansion of invasive exotic species, especially shrub honeysuckles, multiflora rose, buckthorn, and Japanese barberry, in the permanent plots over the past 75 years.

The census of the Hopkins Memorial Forest permanent plot system provides insights into how humans have made enduring impacts on biological communities of the region both on a direct level through different land-use activities and on a global level through global-scale environmental change. More information on the Hopkins Memorial Forest will be available in the coming year, but until then please visit http://www.williams.edu/CES/hopkins.htm.

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