Harvard Forest (HFR)

Founded in 1907, the Harvard Forest is Harvard University's center for field research and education in ecology and conservation and is one of the oldest and most intensively studied landscapes in North America. Through the years researchers at the Forest have focused on forest management, soils, tree biology, forest ecology, forest economics, and ecosystem dynamics. Today this legacy of research and education continues in the Harvard Forest LTER program, initiated in 1988, which seeks to understand historical and modern changes in the landscape of New England and the Northeast resulting from human and natural disturbance processes, and to apply this information to the conservation and management of forest ecosystems.

Site Description and Characteristics. The Harvard Forest is located in Petersham, Massachusetts, 65 miles west of Boston, in the New England upland physiographic region. Elevations range from 210 to 420 meters a.s.l. Bedrock is mainly granite, gneiss and schist. Soils are mainly acidic, moderately to well drained glacial tills, with localized glaciofluvial deposits. January temperature averages -7 degrees C and July averages 20 degrees C. Average annual precipitation is 1070 mm, distributed fairly evenly throughout the year. A persistent snow pack forms in most years. Hurricane wind damage at the F1 level (on the Fujita scale) has occurred on average every 20 years.

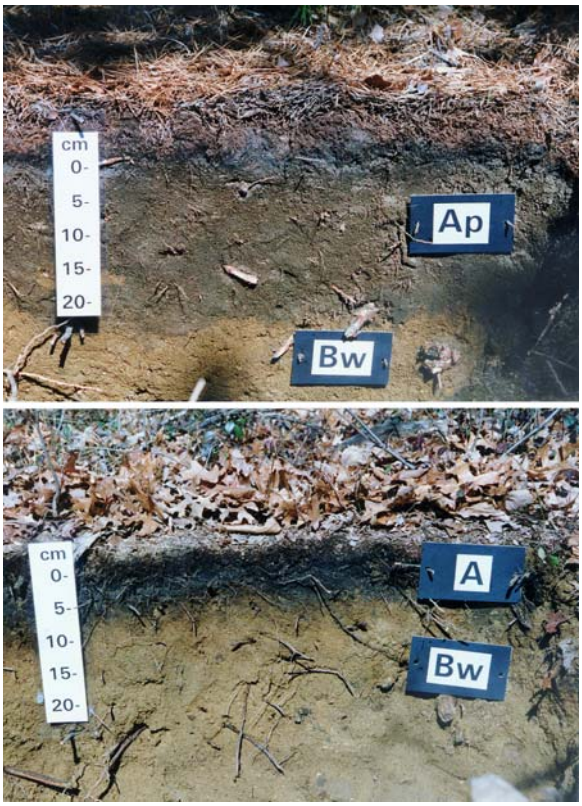
The Forest's 1200 hectares include varied habitats typical of those found throughout central New England, including northern, transition, and central forest types; marshes, hardwood swamps, and conifer bogs; forest plantations; and a 70-acre pond. At the height of agricultural development (1830-1850) approximately 75% of the land was cleared for cultivation or pasture.

Transition hardwood forest with stone walls from the agricultural past.

Research Focus. The temperate forests of central New England support high biodiversity and critical ecosystem functions while providing natural resources and cultural benefits to an expanding human population. The region is shaped by a legacy of landscape change: major shifts in climate, vegetation and disturbance at millennial time scales; extensive deforestation for agriculture in the 17th - 19th centuries; and abandonment of farmlands, natural reforestation and increasing urbanization through the mid-21st century. It is now being (sub)urbanized and fragmented rapidly and exposed to substantial

pollution due to New England's location at the end of the nation's "tail-pipe."

The goal of the HFR LTER is to examine the drivers of landscape change for human populations and for the diverse natural ecosystems of the Northeast. Drivers range from microbes to moose, invasive plants to exotic insects, hurricanes to forest harvesting, and global climate change to regional land use. Their consequences are explored through paleological and historical studies, regional studies, long-term measurements, modeling, and controlled experimental manipulations – several of which are well into their second decade.



Soil profiles from sites with different land-use histories, showing ploughed (Ap) and unploughed (A) surface soil horizons.