



United States  
Department of  
Agriculture

Forest Service

**Northeastern Area**  
*State and Private Forestry*

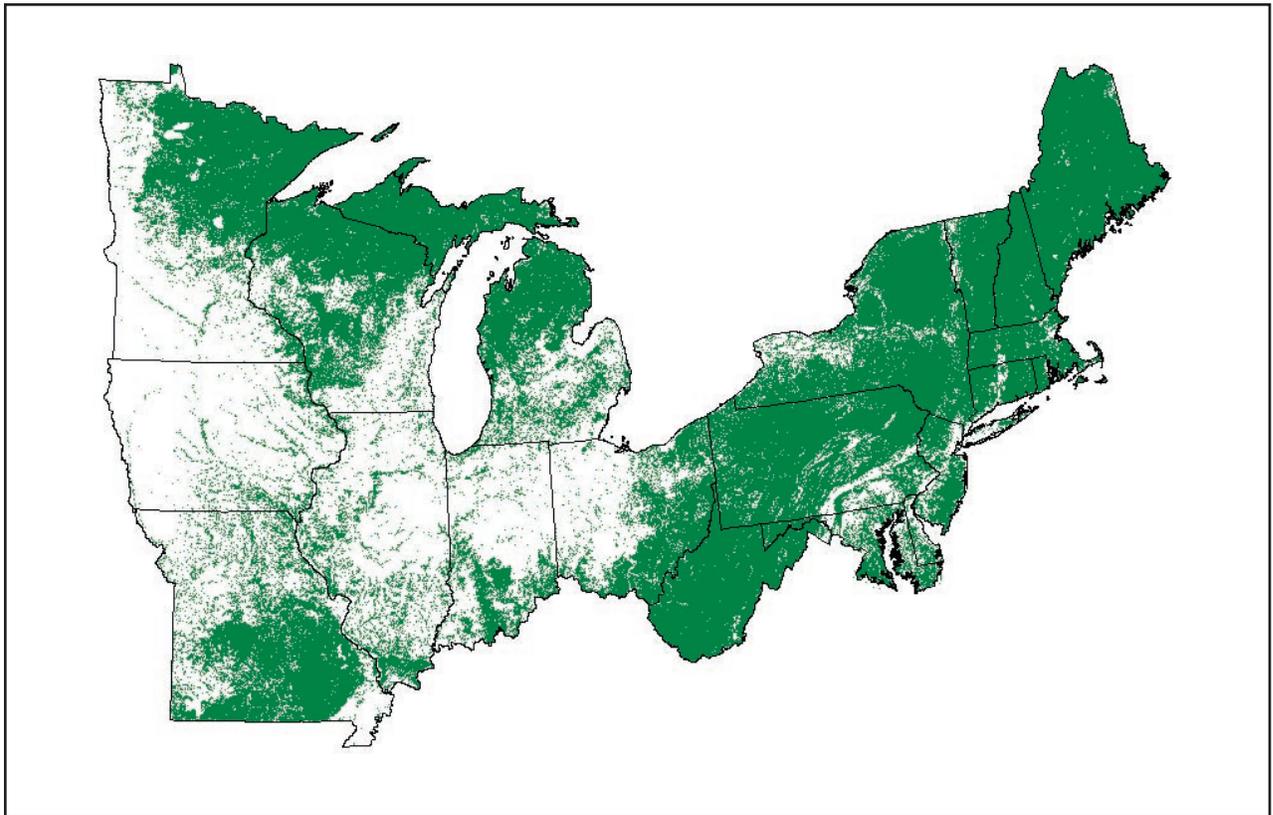
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# Forest Health Monitoring in the Northeastern United States

## Disturbances and Conditions during 1993-2002



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# Executive Summary

A healthy forest is one having the capacity across the landscape for renewal, for recovery from a wide range of disturbances, and for retention of its ecological resiliency while meeting current and future needs of people for desired levels of values, uses, products, and services (USDA Forest Service, 2003a). The objective of the Forest Health Monitoring (FHM) Program of the USDA Forest Service is to report on the status, changes and trends in forest health conditions in a timely manner. The FHM Program accomplishes this mission through cooperation with the Forest Health Protection (FHP) Program, the Forest Inventory and Analysis (FIA) Program, State agencies, and other partners.

This report provides an update of forest disturbances and conditions for a 20-state region that constitutes the administrative region of the Northeastern Area, State and Private Forestry, USDA Forest Service. The report relies upon use of various scientific data that were mostly collected between 1993 and 2002 and obtained from all types of public and private ownerships. The FHM Program relies upon various partners to provide these data.

Various types of disturbances and conditions are presented in this report. Reporting topics correspond to key disturbance issues of forest cover and fragmentation, drought, fire, insects and diseases that damage trees, air pollutants, and soil erosion. The health conditions of forest trees associated with some of these disturbances are also evaluated.

The information related to each reporting topic will be periodically updated from ongoing monitoring efforts. Long-term trends in forest health conditions will eventually become evident as this information is produced.

# Introduction

## Background

A healthy forest is one having the capacity across the landscape for renewal, for recovery from a wide range of disturbances, and for retention of its ecological resiliency while meeting current and future needs of people for desired levels of values, uses, products, and services (USDA Forest Service, 2003a). The objective of the Forest Health Monitoring (FHM) Program of the USDA Forest Service is to report on the status, changes and trends in forest health conditions in a timely manner. The FHM Program works in cooperation with State agencies and other USDA Forest Service Programs including Forest Health Protection (FHP) and Forest Inventory and Analysis (FIA).

The FHM Program involves four types of activities: (1) Detection Monitoring, (2) Evaluation Monitoring, (3) Intensive Site Monitoring, and (4) Research on Monitoring Techniques. This report focuses on Detection Monitoring activities and indicates disturbance events and forest conditions that may warrant further investigation through Evaluation Monitoring and Intensive Site Monitoring.

## Scope of Report

This report describes forest disturbances and conditions for a 20-state region that constitutes the administrative region of the Northeastern Area, State and Private Forestry, USDA Forest Service. The constituent States are Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin. Forest types of oak-hickory, sugar maple-beech-birch, aspen-birch, white-red-jack pine, and spruce-fir occur throughout the region, along with disturbance events and forest health issues common across state boundaries.

## Data Sources

This report relies upon use of various scientific data that were mostly collected between 1993 and 2002 and obtained from all types of public and private ownerships. The FHM Program relies upon various partners to provide these data. Together, the FHM and Forest Health Protection (FHP) Programs provide aerial and ground data from surveys of damages caused by specific causal agents. The FHP Program also provides narratives of causal agent occurrences in Pest Condition Reports. The Forest Inventory and Analysis (FIA) Program provides data from remotely sensed sources (Phase 1) and from ground plots (Phase 2 and Phase 3) where a variety of forest health indicators are measured.

For this report, net growth rates and mortality rates were estimated from thousands of FIA plots (Phase 2) with an average measurement period of 1985 to 1995. Estimates of tree crown condition, tree damage, lichens, injury to ozone-sensitive plants, soil erosion, and coarse woody material were obtained from a subset of FIA plots (Phase 3). Details of sampling intensity and how plots were measured can be found on the FIA Internet site at <http://www.fia.fs.fed.us/library.htm>.

Ancillary data used in this report include drought information from the National Oceanic and Atmospheric Administration (NOAA), air pollutant data from the Environmental Protection Agency (EPA), wildland and prescribed fire data from the National Interagency Fire Center (NIFC), and human population data from the U.S. Census Bureau.