NEW HAMPSHIRE

FOREST SERVICE RESEARCH AND DEVELOPMENT

STATE FUNDING HISTORY	Enacted FY 2003 ($)	Enacted FY 2004 ($)	Pres. Budg. FY 2005 ($)
DURHAM			
NE-4104 Modeling Forest Growth/Structure	601,558	1,108,147	$1,209,560
NE-4155 Northern Forest Ecosystems	1,288,626	1,451,243	1,594,640
NE-4352 Forest Ecosystem Dynamics Northeastern States Research Coop	3,239,462	3,223,198	3,227,125
NE-4505 Stress Related Host Pest Protection	845,164	834,752	854,583
NEW HAMPSHIRE TOTAL	5,974,810	6,617,340	6,885,908

RESEARCH & DEVELOPMENT, a division of the USDA Forest Service (FS R&D), strives to be the "go to" organization for information and solutions to sustain forests and rangelands and the values they provide people. FS R&D has the flexibility to address today's issues effectively and to respond to tomorrow's needs. Among the world's leaders in forest conservation research, scientists contribute to the stewardship of land, real property and society by providing research results that help create jobs and affordable homes, and improve the health of trees, forests and forest ecosystems. Innovative research products permit the Forest Service and other public and private land managers to monitor and manage forest responses to environmental change, contributing significantly to the sustainability of the nation's forests and rangelands and improving human health.

FS R&D operates six research stations, the Forest Products Laboratory, and the International Institute of Tropical Forestry located in Puerto Rico. It employs over 500 scientists and hundreds of technical and support personnel at 67 field sites throughout the nation. The FY 2005 President's Budget includes $280,654,000 for Forest and Rangeland Research.

The Northeastern Research Station, headquartered at Newtown Square, Pennsylvania, maintains forest and rangeland research and development programs across 13 northeastern states (i.e. CT, DE, MD, MA, NJ, NY, NH, ME, OH, PA, RI, WV, and VT). The FY 2005 President's Budget for the Northeastern Research Station is $34,697,000. The Northeastern Research Station maintains four research work units in New Hampshire, all located at Durham.

DURHAM

NE-4505, Forest Sustainability and Tree Response to Injury, Infection, and

Environmental Change. This unit conducts research to improve the sustainability of rural and urban forests through concepts, tools, and practices based on the biological response of trees to disease and disturbance. Current research is focused on: (1) the evaluation of risk to forest sustainability from chronic and acute disturbance by understanding the effects of disturbance and a changing chemical environment on tree biology; (2) improving the utilization of wood from rural forests and the care of trees in urban and community forests through knowledge synthesis, tool development, and transfer of information concerning the response of trees to injury and infection.

NE-4155, Ecology and Management of Northern Forest Ecosystems. This unit provides fundamental scientific information and appropriate practical guidelines needed to manage northern forest ecosystems for both ecological and economic sustainability. Current research focuses on: (1) understanding both ecologic and economic impacts of forest ecosystem manipulation; (2) understanding relationships between composition and structure of forests and the needs of wildlife; (3) understanding how natural and anthropogenic disturbances affect ecological processes.

NE-4352, Ecological Processes: A Basis for Managing Forests and Protecting Water Quality in New England. This unit conducts research addressing environmental concerns in New England forests and streams including nitrogen saturation and cation depletion. This unit also operates the Hubbard Brook Experimental Forest and Cone Pond Research Watershed for short and long-term research on ecological processes.

NE-4104, Forest Carbon Dynamics and Estimation for Sustainable Management. This unit studies the stocks and flows of carbon in forest ecosystems and their response to natural disturbances, environmental change, management practices, and land use change, to provide science-based information and tools for landowners to assess carbon sequestration through sound forest management.

Northeastern States Research Cooperative. The Northeastern States Research Cooperative (NSRC) is a competitive research grant program designed to support cross-disciplinary, collaborative research in the four Northern Forest states of Maine, New Hampshire, Vermont, and New York. Congress authorized creation of the NSRC in the 1998 Agricultural Research Act (Public Law 105-185), building on ideas initially drafted as part of the larger Northern Forest Stewardship Act. Specific NSRC research goals outlined by Congress include addressing the economic, social, and environmental challenges unique to the Northern Forest.

FY 2005 PROGRAM CHANGES:

The President's Budget for FY 2005 includes an increase of $268,568 above the FY 2004 enacted budget.

- An increase of $100,000 for NE-4104 will be used to develop a hybrid growth/yield and ecosystem process model to assimilate and utilize carbon-monitoring data from experimental forests.
- An increase of $140,000 for NE-4155 will be used to improve biomass-monitoring techniques and enhance carbon monitoring at experimental

forests in NH and ME.

- Science-based Technology Transfer. Forest Service Research and Development will lead an Agency-wide effort to optimize the delivery and practical use of research findings. This is essential to successful implementation of Forest Service priorities, including the President's Healthy Forest Initiative. Opportunities have been identified that leverage current science and technology applications efforts in healthy forests applied science, watershed management, invasive species, hazardous fuels utilization and management, and community preparedness. New funds in FY 2005 will be targeted to leading-edge technical assistance on a competitive basis.

SIGNIFICANT RESEARCH PRODUCTS:

- Guidelines were published about how to manage uneven-aged northern hardwood stands and how precommercial thinning and herbicides can be used to meet management objectives in northern conifer stands.
- Developed techniques for estimating forest productivity and foliar nutrient status using hyperspectral remote sensing. This methodology is being used to investigate sugar maple health throughout the northeast, to study the spread of hemlock wooly adelgid (HWA), and the to examine the susceptibility of eastern hemlock stands to decline from HWA.
- Published data on the patterns of injury from storms and other causes with the greatest effect of wood quality and value
- Developed thresholds of nitrogen deposition that can occur without causing unusual levels of tree stress or threaten forest productivity.
- Developed an interactive web tool that allows users to obtain forest carbon stock estimates for their forests.
- Developed consistent biomass equations for all tree species in the United States.
- Determined that net calcium to sodium ration is a useful tool for evaluating ecosystems calcium dynamics. Results suggest that calcium loss continues for at least 30 years after disturbance.
- Determined that the natural abundance of a nitrogen isotope (15N) can be a used to evaluate ecosystem response to various disturbances, including atmospheric deposition.

SOME CLIENTS/COOPERATORS:

Cornell University
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Institute of Ecosystem Studies
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University of Vermont
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