



VERMONT

FOREST SERVICE RESEARCH AND DEVELOPMENT

STATE FUNDING HISTORY	Enacted FY 2003 (\$)	Enacted FY 2004 (\$)	Pres. Budg. FY 2005 (\$)
BURLINGTON			
NE-4103 Physio of Growth in Trees	903,828	1,029,693	1,035,652
NE-4454 Soc Dimen/Forest Mgmt	1,286,098	1,276,239	1,293,167
VERMONT TOTAL	2,189,926	2,305,932	2,328,819

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 two research work units in Vermont, both located at Burlington.

BURLINGTON

NE-4103, The Role of Environmental Stress on Tree Growth and Development. This unit evaluates the effects of environmental stress on the physiology and morphology of the Northern forest ecosystem. Research is underway to: (1) develop improved indicators of forest stress and evaluate the underlying stress response and survival mechanisms that promote forest health and

productivity; (2) better understand the physiological basis of drought- and frost-stress resistances of forest species in different ecosystems.

NE-4454, Integrating Social and Biophysical Sciences for Natural Resource Management.

This unit performs and integrates social and biophysical research for natural resource management. The research develops products that make research results available and useful for policy, planning, and management. Four areas of research are being addressed.

- Social structures and processes: Resource managers need an improved understanding of the relationships among social institutions and organizations, forest management, and forest ecosystem processes to achieve their policy and management goals.
- Individual values and decision making: Research on this problem identifies and analyzes the key human values that affect natural resource decisions, and incorporate these values into better management tools.
- Management applications: Natural resource managers need sufficient information on the array of human values and requirements that affect resource management, planning, and policy decisions.
- Tool development: There is a need for decision support tools that integrate the best knowledge available about biophysical and social systems and assist managers and policy makers in using this knowledge to make decisions.

FY 2005 PROGRAM CHANGES:

- 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:

- Research with sugar maple and red spruce has shown that low calcium availability is associated with reduced growth and elevated crown injury within native stands. Results suggest more forests will become deficient in calcium as acid deposition and other factors continue to deplete environmental calcium stores.
- Research on tree hydraulics provided a better understanding of how trees move water. This work continues to attract international attention and is viewed as being on the cutting edge of the field. Research on tree hydraulics and drought physiology is important because tree productivity (growth and biomass gain) is controlled by hydraulic efficiency and resistance to episodes of drought.
- Researchers developed and distributed hundreds of copies of software to promote better-informed decision making for ecosystem management.
- Research on redefining the Recreational Opportunity Spectrum for the eastern United States has been adopted by several states in the Northeast.
- Developed extensive information on how people use the forested environment to support their

livelihoods in rural, poor communities and published extensive case studies and historical analyses of the use of non-timber forest products throughout the United States.

- Published a review of the riparian ecology of urban areas, an analysis that is breaking new ground in integrating social and physical research.

SOME CLIENTS/COOPERATORS:

Canadian Forest Service

Cornell University

Green Mountain National Forest

Maryland Department of Natural Resources

Paul Smith's College

Pennsylvania State University

University of Vermont

