

Making a
**World *of*
Difference**
Since 1923





We believe that strong forests **make a difference in the world.**

Strong forests give us blue skies, clean water, energetic economies and peaceful solitude. Preserving natural resources for tomorrow's generations begins with today's fundamental insights.

Our job is to provide the knowledge, tools and leadership to help people make informed decisions about the natural world. Strong forests are rooted in sound science, and that's how we **make a world of difference.**



Northeastern Research Station
USDA Forest Service

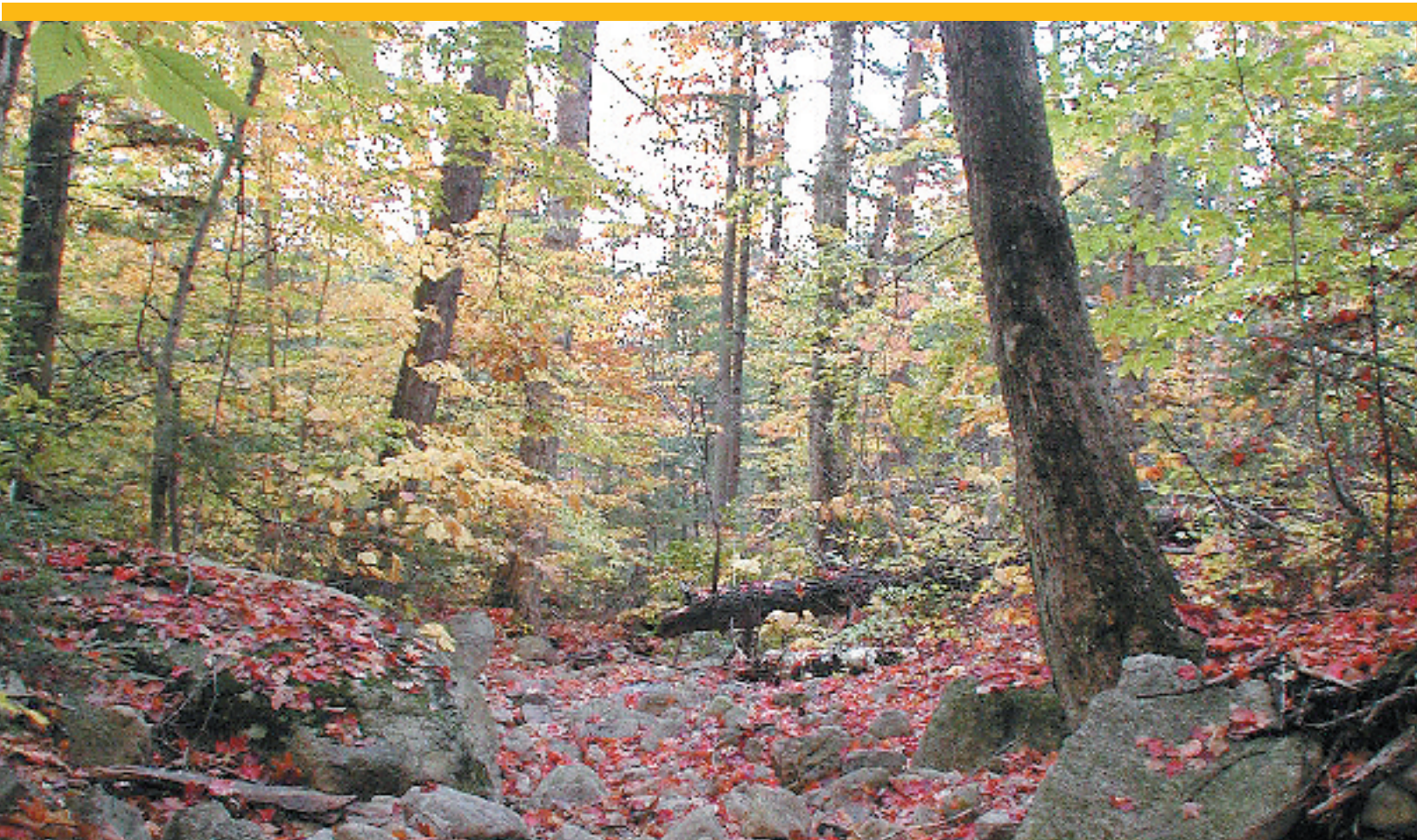


Eight research regions consisting of 75 major science laboratories form the Research and Development division of the Forest Service. The Northeastern Research Station, based near Philadelphia, conducts world-class research in 13 states in the New England and mid Atlantic region.

Natural resources in the Northeastern Station region are undergoing historic change. Already the most densely populated and densely forested part of the U.S., our landscapes carry mounting burdens.

Consider:

- In the northeast, about 100 acres of open space are lost each day to housing developments, shopping malls or other growth projects.
- Non-native insects have invaded natural and urban forests, where they often displace native species, kill trees, threaten human health and cost \$138 billion a year in economic damages and control costs. The insect invaders are often accidentally introduced through foreign cargo shipped to eastern seaports.
- In the next century, global climate change and pollution will do an extreme makeover on northern forests and the wildlife that inhabit them...the damage has already begun in forests affected by heavy acid rain.
- The northeast's valuable hardwood forests are being hijacked by red maple, and other species considered less valuable.
- Wildlife and plant diversity is dwindling due to habitat loss.





Who makes decisions about our ecosystems?

And whose job is it to see that people and nature live together in health and harmony?

In New England and the mid-Atlantic states, it's often the private landowner who must decide: about 80 million of the 93 million acres of forest here are privately held.

But it's also the borough council member who votes to permit new homebuilding, the state engineer who handles environmental cleanup projects, the sawmill owner who decides to plant, harvest, or subdivide, and the conservationist who is the grassroots opinion leader on natural resource plans.

The Northeastern Research Station helps by informing their choices. Teams of scientists investigate important issues in ten major science laboratories, including the nation's only supersecure quarantine lab that breeds and studies tree-killing insects.

No choices may be more important than those we make about the environment. The actions we take can have lasting impact upon the well-being of our planet and all humanity.

The Northeastern Research Station supports efforts to help young people make wise choices about the environment by developing their understanding of our environment. In the long-term, environmental literacy is enhanced.

Environmental action begins with environmental literacy, so the Station has made environmental literacy a cornerstone of its program, crucial to our conservation mission.

Our scientists communicate their findings in about 450 articles, books or reports each year. Although many appear in peer-reviewed journals, the Station also has its own press for technical reports, proceedings, and science newsletters.

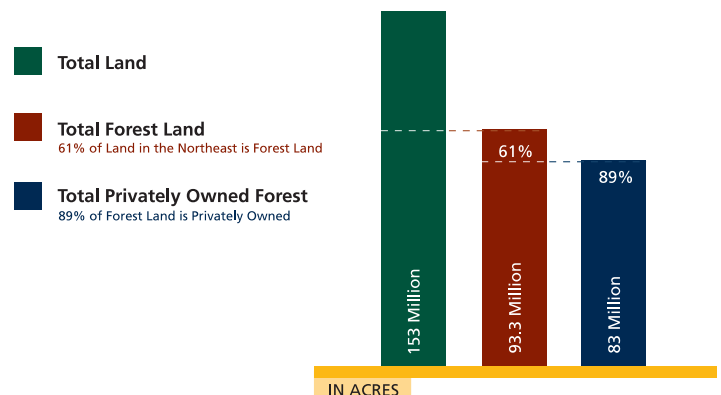
We also work hard to develop tools that support decision makers in their work: customized software, detailed modeling programs, new processes, and hands-on forest management training. Our scientists are indispensable players in the large process that puts new technologies in the hands of natural resource decision makers.

The goal of the Northeastern Research Station is to serve society in the 13-state region by developing and communicating the scientific information and innovative technology required to manage, protect, use, and sustain the natural resources of the region's forests.

The strategic direction of our scientific work includes developing and delivering information to help rural and urban landowners address issues associated with forest stress, use and sustainability; social and economic drivers and impacts; and status and trends of natural resources. Our work is cooperative in its approach as we strive to be a respected partner with many clients, especially academic institutions and state forestry agencies.

Annually, we provide about \$4.1 million for cooperative research in the United States; \$3.7 million (91%) funds cooperative research in the Station's 13 northeastern states.

LAND IN THE NORTHEAST





Laboratories

Amherst, MA; Burlington, VT; Delaware, OH; Durham, NH; Hamden, CT; Princeton, Parsons and Morgantown, WV; Syracuse, NY; Warren, PA.



Headquarters

Newtown Square, PA



Experimental Forests

Maine (Massabesic, Penobscot); NH (Bartlett, Hubbard Brook); NJ (Silas Little); OH (Vinton Furnace); PA (Kane); WV (Fernow)



Long Term Ecological Research Sites

Baltimore, MD; Hubbard Brook, NH.



Research Natural Areas

The Bowl, Alpine Gardens and Nancy Brook in the White Mountains, NH; Reas Run in the Wayne National Forest, OH; Tionesta in the Allegheny National Forest, PA; and The Cape in the Green Mountain National Forest, VT.



Ecological Management Area

Raccoon, in southeast OH.



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NORTHEASTERN RESEARCH STATION: By the Numbers

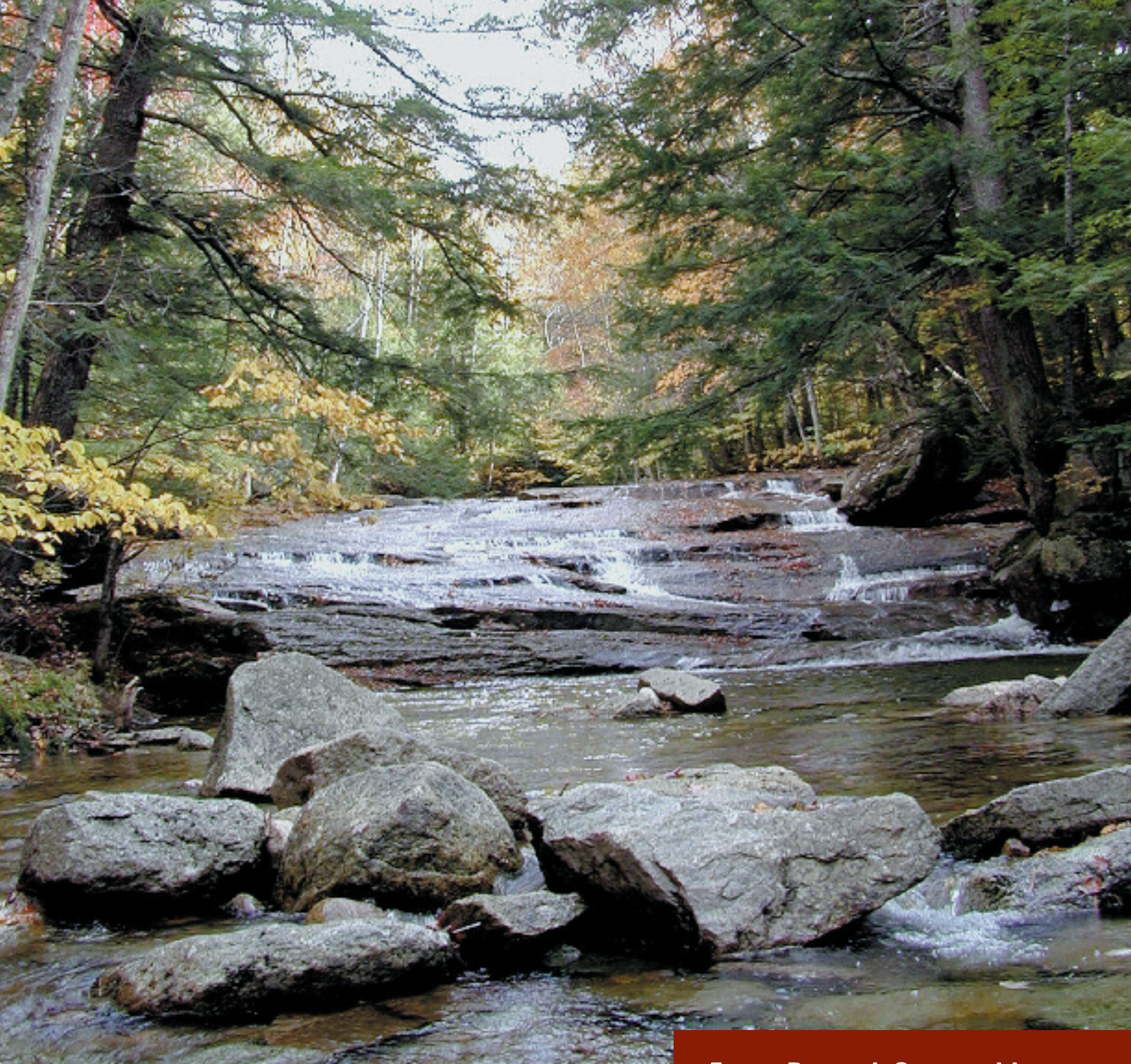
Total Employees	418
• Permanent, Temporary, Term	
Research Technicians	226
Research Scientists	106
Research Projects	20
States We Serve	13
Major Science Laboratories	10
Experimental Forests	8
Research Natural Areas Jointly Administered by the National Forest System	6
National Science Foundation Long Term Ecological Research Sites	2
• <i>Baltimore Urban Ecology Study</i>	
• <i>Hubbard Brook Forest, New Hampshire</i>	

Research Projects and Programs of the Northeastern Research Station

State	Location	Project or Program No.	Project or Program Focus	Project or Program Leader	Telephone No. Website
CT	Hamden (and Ansonia)	NE-4501 NE-4502	<ul style="list-style-type: none"> • Forest Insect Biology & Biocontrol • Pathology & Microbial Control of Insects Defoliating Eastern Forest Trees 	Kathleen S. Shields Michael L. McManus	203-230-4330 203-230-4322 www.fs.fed.us/ne/hamden/
MA	Amherst	NE-4251	<ul style="list-style-type: none"> • Wildlife & Fish Habitat Relationships & Recreation Opportunities in New England Forests 	Richard M. DeGraaf	413-545-0357 www.fs.fed.us/ne/amherst/
MD	Baltimore (Long-Term Ecological Research site)	NE-4952 NE-4454	<ul style="list-style-type: none"> • Effects of Urban Forests & their Management on Human Health & Environmental Quality • Integrating Social & Biophysical Sciences for Natural Resource Management 	David J. Nowak Mark J. Twery	315-448-3212 www.fs.fed.us/ne/syracuse/ 802-951-6771 www.fs.fed.us/ne/burlington/
NH	Durham	NE-4104 NE-4155 NE-4352 NE-4505	<ul style="list-style-type: none"> • Forest Carbon Dynamics & Estimation for Sustainable Management • Ecology & Management of Northern Forest Ecosystems • Ecological processes: A Basis for Managing Forests & Protecting Water Quality in New England • Forest Sustainability & Tree Response to Injury, Infections, and Environmental Change 	Linda S. Heath John C. Brissette Christopher Eagar Kevin T. Smith	603-868-7612 603-868-7632 603-868-7636 603-868-7624 www.fs.fed.us/ne/durham/
NJ	Pine Barrens	NE-4455	<ul style="list-style-type: none"> • Regional Climate & Fire Danger Modeling (as part of Northern Global Climate Change Program) 	Richard A. Birdsey	610-557-4092 www.fs.fed.us/ne/global/
NY	Syracuse	NE-4952	<ul style="list-style-type: none"> • Effects of Urban Forests & their Management on Human Health & Environmental Quality 	David J. Nowak	315-448-3212 www.fs.fed.us/ne/syracuse/
OH	Delaware	NE-4153 NE-4509 NE-4558	<ul style="list-style-type: none"> • Quantifying, Predicting, & Managing Forest Responses at Multiple Scales • Genetics & Management of Invasive Forest Insect Pests, Diseases, & Beneficial Fungi • Sustaining Forest Health & Regeneration in Central & Northern Hardwood Forests on the Allegheny Plateau 	Daniel A. Yaussy Jim Slavicek Robert Long	740-368-0101 740-368-0033 www.fs.fed.us/ne/delaware/ 740-368-0052
PA	Newtown Square Warren	NE-4801 NE-4455 NE-4152	<ul style="list-style-type: none"> • Forest Inventory & Analysis Program • Northern Global Climate Change Program • Research to Develop Guidelines & Indicators for Sustaining Forest Ecosystems of PA & Adjacent Allegheny Plateau Region 	Charles T. Scott Richard A. Birdsey Susan L. Stout	610-557-4020 610-557-4092 814-563-1040 www.fs.fed.us/ne/fia/ www.fs.fed.us/ne/global/ www.fs.fed.us/ne/warren/
VT	Burlington	NE-4103 NE-4454	<ul style="list-style-type: none"> • The Role of Environmental Stress on Tree Growth & Development • Integrating Social & Biophysical Sciences for Natural Resource Management 	Mel T. Tyree Mark J. Twery	802-951-6771 802-951-6771 www.fs.fed.us/ne/burlington/
WV	Morgantown Parsons Princeton	NE-4557 NE-4751 NE-4353 NE-4701 NE-4803 NE-4805	<ul style="list-style-type: none"> • Disturbance Ecology & Management of Oak-Dominated Forests • Integration of Forest Operations into Eastern Hardwood Intermediate Cuttings & Structural Retention Treatments • Sustaining the Diversity & Productivity of Appalachian Forests • Efficient Use of the Northern Forest Resource • Eastern Forest Use in a Global Economy • The Influence of Markets on the Sustainability of Eastern Hardwood Forests 	Kurt W. Gottschalk Chris. B. LeDoux Mary Beth Adams Jan Wiedenbeck Bruce G. Hansen William G. Luppold	304-285-1598 304-285-1572 www.fs.fed.us/ne/morgantown/ 304-478-2000 www.fs.fed.us/ne/parsons/ 304-431-2701 304-431-2739 304-431-2770 www.fs.fed.us/ne/princeton/

Current Workforce, Northeastern Research Station, USDA Forest Service

State FY 2005	Location	Project or Program No.	Projects and Programs	Scientists	Technical Support Staff	Administrative & Clerical Support	Total Employees FY 2005
CT	Hamden	NE-4501	• Forest Insect Biology & Biocontrol	5	8	1	14
		NE-4502	• Pathology & Microbial Control of Insects Defoliating Eastern Forest Trees	3	4	1	8
			• Administration	0	1	5	6
			• Subtotal, Connecticut	8	13	7	28
MA	Amherst	NE-4251	• Wildlife & Fish Habitat Relationships & Recreation Opportunities in New England Forests	6	3	1	10
NH	Durham	NE-4104	• Forest Carbon Dynamics & Estimation for Sustainable Management	5	4	0	9
		NE-4155	• Ecology & Management of Northern Forest Ecosystems	9	8	1	18
		NE-4352	• Ecological Processes: A Basis for Managing Forests & Protecting Water Quality in New England	6	9	1	16
		NE-4505	• Forest Sustainability & Tree Response to Injury, Infections & Environmental Change	3	3	0	6
			• Administration	0	1	5	6
	• Subtotal, New Hampshire	23	25	7	55		
NY	Syracuse	NE-4952	• Effects of Urban Forests & their Management on Human Health & Environmental Quality	5	8	1	14
OH	Delaware	NE-4153	• Quantifying, Predicting, & Managing Forest Responses at Multiple Scales	4	9	0	13
		NE-4509	• Genetics & Management of Invasive Forest Insect Pests, Diseases, & Beneficial Fungi	5	9	0	14
		NE-4558	• Sustaining Forest Health & Regeneration in Central & Northern Hardwood Forests on the Allegheny Plateau	3	2	1	6
			• Administration	0	1	6	7
	• Subtotal, Ohio	12	21	7	40		
PA	Warren	NE-4152	• Research to Develop Guidelines & Indicators for Sustaining Forest Ecosystems of PA & Adjacent Allegheny Plateau Region	7	7	1	15
			• Administration	0	0	6	6
			• Subtotal Warren	7	7	7	21
	Newtown Square	NE-4801	• Forest Inventory & Analysis Program	9	62	4	75
		NE-4455	• Northern Global Climate Change Program	4	7	0	11
			• Director's Office	4	4	3	11
			• Administration	0	26	22	48
			• Subtotal, Newtown Square	17	99	29	145
	• Subtotal, Pennsylvania	24	106	36	166		
VT	Burlington	NE-4103	• The Role of Environmental Stress on Tree Growth & Development	3	4	1	8
		NE-4454	• Integrating Social & Biophysical Sciences for Natural Resource Management	6	7	1	14
			• Administration	0	0	2	2
			• Subtotal, Vermont	9	11	4	24
WV	Morgantown	NE-4557	• Disturbance Ecology & Management of Oak-Dominated Forests	6	12	1	19
		NE-4751	• Integration of Forest Operations into Eastern Hardwood Intermediate Cuttings & Structural Retention Treatments	1	1	0	2
			• Administration	0	1	8	9
			• Subtotal, Morgantown	7	14	9	30
	Parsons	NE-4353	• Sustaining the Diversity & Productivity of Appalachian Forests	5	13	6	24
			• Administration	0	0	3	3
			• Subtotal, Parsons	5	13	9	27
	Princeton	NE-4701	• Efficient Use of the Northern Forest Resource	2	7	1	10
		NE-4803	• Eastern Forest Use in a Global Economy	4	5	1	10
		NE-4805	• Influence of Markets on the Sustainability of Eastern Hardwood Forests	1	0	0	1
			• Administration	0	0	3	3
			• Subtotal, Princeton	7	12	5	24
	• Subtotal, West Virginia	19	39	23	81		
• TOTALS, RESEARCH AND DEVELOPMENT				106	226	86	418



Future Research Opportunities

There is no shortage of important natural resource issues to investigate in the Northeast. Consider landscapes that are changing from human activity, coastal water “dead zones” from industrial and agricultural runoff, and dire forecasts about safe and ample drinking water. Consider pressures from global climate change and air pollution, the pending crisis of the loss of plant and animal biodiversity, and mounting stress on forests from human and natural causes.

We will continue policy-relevant work at our individual research units and broaden focus in:

- Watershed management, and sustaining water quality in the mid-Atlantic region
- Climate change measurement techniques and carbon gas monitoring
- Air pollution mitigation
- Community “re-greening” efforts
- Invasive insect control
- Markets for underused woods and woody debris.

Field Work

Experimental Forests, Research Natural Areas, and Long-Term Ecological Research sites (LTERs) are living laboratories, often set on National Forest lands, which represent a specific ecosystem for long-term study.

Decades-long research at our eight Experimental Forests has produced some irreplaceable data sets that are unique to science. In addition to discovery of basic knowledge, the research has practical applications: at the Penobscott (Maine) Experimental Forest, 40 years of study have identified best management practices for northern evergreens. Thousands of landowners use this on-going landmark research to meet their growth objectives, whether timber manufacturing, supporting wildlife, or recreation.

At the Kane Forest in Pennsylvania, 70 years of research has led to, among other things, a user-friendly computer program for managing oak forests that

has been hailed as the “basis for all forest management” by Pennsylvania’s state forester. The Hubbard Brook Experimental Forest, in New Hampshire, is also a National Science Foundation Long-Term Ecological Research (LTER) site, one of only 24 in the world. Hydrology data collected at Hubbard Brook serve as the foundation for world famous research on water, nutrient and energy cycling in forest ecosystems.

We administer another National Science Foundation LTER project, a whole-city laboratory of Baltimore, where we do urban forestry science. It is one of two urban LTERs in the world.

Funding is a problem at our experimental forests. Declining budgets make it increasingly difficult to manage the sites, and don’t keep up with costs for continuing long-term work or road and building maintenance.

Discoveries & Innovations

Our scientists make discoveries and successfully deliver new technologies, reflecting a culture where theory and practice are united in an environment that fosters vision and practical application.

People and institutions have come to rely on us for comprehensive information on forest ecosystems and management, for relevant research and innovative policy recommendations, for up-to-the-minute reports about forest productivity, for partnerships and funding, and for much more. Our scientific progress is a tribute to the dedicated scientists, researchers and support staff at the Station.

Significant outcomes, within current research emphasis areas, include:

- Launched the American Elm Restoration Project with Dutch Elm Disease-resistant species developed by our scientists. The hardy elms were planted in forests, where they can co-evolve with the pathogen that kills them in streetscapes.
 - Developed a risk map identifying areas of the U.S. most susceptible to infection by the pathogen that causes Sudden Oak Death.
 - Established colonies in Eastern states of Chinese lady beetles that provide a non-chemical, biological method for controlling the hemlock woolly adelgid, an invasive insect that devastates native hemlocks.
 - Developed a model that predicts the timing of life stages of the Asian longhorned beetle, allowing pest controllers to choose the best time for eradication and control of this tree-killing exotic insect.
 - Developed DNA markers to identify the origins of the Asian longhorned beetle in North America.
 - Developed methods for determining the susceptibility of trees to invasive species attacks.
 - Confirmed the presence and spread in Ohio of a pathogen that causes Beech Bark Disease.
 - Identified new strains of American beech trees that are resistant to attack by Beech Bark Disease.
- Initiated the LANDFIRE prototype to develop fire risk maps in the wildland-urban interface in the eastern United States, which will aid in fire preparedness.
 - Developed methods to manage prescribed fires.
 - Developed computer programs to quantify and project the effects of trees in urban environments on air and water quality, ultra-violet radiation, and energy use.
 - Monitored forest and human health trends in urbanizing environments.
 - Developed greenhouse gas (carbon) accounting guidelines for the President’s voluntary greenhouse gas emissions reductions program.
 - Led comprehensive studies of an urban ecosystem in Baltimore, one of two National Science Foundation urban long-term ecological research sites in the world.
 - Increased the accuracy of satellite tree and impervious cover maps to assess urban tree cover.
 - Social scientists, involved with the our Living Memorials Project, find that Americans are creating outdoor memorials, ranging from a single tree planting to a 350 acre farm, to commemorate victims of September 11.





The Budget: National and Station Funding

In FY 2004, total national funding for Forest Service Research and Development was \$266,387,000. The Northeastern Research Station received \$34,043,000 or 12.8 percent of this amount. In addition, the Northeastern Research Station received \$6,306,530 in other funds for facilities improvement and maintenance, implementation of the National Fire Plan, and funds from other mission areas within and outside the agency to help carry out planned research activities.

In FY 2005, the appropriation for Forest Service Research and Development is \$276,384,000. The Northeastern Research Station will receive \$36,495,000 of this total or 13.2 percent of this amount.

The following table illustrates the FY 2004 summary budget for the Station. The second table in this section illustrates the FYs 2004 — 2005 budgets for the Northeastern Research Station in detail by state, projects and programs.

FY 2004 Budget Northeastern Research Station USDA Forest Service

Program	Amount
Forest and Rangeland Research (R&D) (Base Program)	\$34,043,000
Additional R&D Funding for Special Emphasis Projects	346,000
<i>Subtotal, Forest and Rangeland Research</i>	<i>34,389,000</i>
Other:	
State, Private, and International Forestry	1,395,902
National Forest System	25,000
Capital Improvement and Maintenance	1,351,000
National Fire Plan Implementation	646,000
Other Internal Funds, including Title IV	885,000
Other External Funds, including Interagency Agreements	2,003,628
<i>Subtotal, Other</i>	<i>6,306,530</i>
Total	\$40,695,530

The following table illustrates national funding trends and needs for the FIA program:

Program Components	FY 2004 Final	FY 2005 Final	Estimated Program Needs
Forest Inventory and Analysis:			
Research and Development	\$7,824,000	\$8,693,000	\$10,500,000
Total	\$7,824,000	\$8,693,000	\$10,500,000

FYs 2004-2005 Funding, by State, Projects, and Programs, Northeastern Research Station, USDA Forest Service

State, Projects, and Programs	FY 2004 Final	FY 2005 Final	FY 2005 (+);(-) From FY 2004
CONNECTICUT:			
Hamden:			
NE-4501 Forest Insect Biology & Biocontrol	\$1,668,562	\$2,757,562	\$1,089,000
NE-4502 Pathology & Microbial Control of Insects Defoliating Eastern Forest Trees	825,913	801,386	-24,527
Subtotal, Connecticut	2,494,475	3,558,948	1,064,473
MASSACHUSETTS:			
Amherst:			
NE-4251 Wildlife & Fish Habitat Relationships & Recreation Opportunities in New England Forests	1,023,307	992,918	-30,389
NEW HAMPSHIRE:			
Durham:			
NE-4104 Forest Carbon Dynamics & Estimation for Sustainable Management	1,108,147	1,200,239	92,092
NE-4155 Ecology & Management of Northern Forest Ecosystems	1,451,243	1,483,146	31,903
NE-4352 Ecological Processes: A Basis for Managing Forests & Protecting Water Quality in New England	3,223,198	3,250,131	26,933
NE-4505 Forest Sustainability & Tree Response to Injury, Infections, & Environmental Change	834,752	809,963	-24,789
Subtotal, New Hampshire	6,617,340	6,743,479	126,139
NEW YORK:			
Syracuse:			
NE-4952 Effects of Urban Forests & Their Management on Human Health & Environmental Quality	1,189,550	1,204,224	14,674
OHIO:			
Delaware:			
NE-4153 Quantifying, Predicting, & Managing Forest Responses at Multiple Scales	906,590	879,667	-26,923
NE-4509 Genetics & Management of Invasive Forest Insect Pests, Diseases, & Beneficial Fungi	1,227,576	1,474,576	247,000
NE-4558 Sustaining Forest Health & Regeneration in the Central & Northern Hardwood Forests on the Allegheny Plateau	792,522	768,987	-23,535
Subtotal, Ohio	2,926,688	3,123,230	196,542
PENNSYLVANIA:			
Warren:			
NE-4152 Research to Develop Guidelines & Indicators for Sustaining Forest Ecosystems of Pennsylvania & the Adjacent Allegheny Plateau Region	1,223,666	1,302,327	78,661
Newtown Square:			
NE-4801 Forest Inventory & Analysis Program	7,824,000	8,693,000	869,000
NE-4455 Northern Global Change Research Program	1,339,453	1,524,676	185,223
NE-XXX Baltimore Urban Forestry Cooperative	198,000	197,000	-1,000
NE-XXX Agenda 2020	168,892	168,890	-2
Subtotal, Newtown Square	9,530,345	10,583,566	1,053,221
Subtotal, Pennsylvania	10,754,011	11,885,893	1,131,882
VERMONT:			
Burlington:			
NE-4103 The Role of Environmental Stress on Tree Growth & Development	1,029,693	999,114	-30,579
NE-4454 Integrating Social & Biophysical Sciences for Natural Resource Management	1,197,239	1,211,685	14,446
Subtotal, Vermont	2,226,932	2,210,799	-16,133
WEST VIRGINIA:			
Morgantown:			
NE-4557 Disturbance Ecology & Management of Oak-Dominated Forests	2,265,560	2,271,560	6,000
NE-4751 Integration of Forest Operations into Eastern Hardwood Intermediate Cuttings & Structural Retention Treatments	227,838	221,072	-6,766
Subtotal, Morgantown	2,493,398	2,492,632	-766
Parsons:			
NE-4353 Sustaining the Diversity & Productivity of Appalachian Forests	1,912,233	1,949,233	37,000
Princeton:			
NE-4701 Efficient Use of the Northern Forest Resource	1,116,603	1,083,444	-33,159
NE-4803 Eastern Forest Use in a Global Economy	1,136,244	1,102,501	-33,743
NE-4805 The Influence of Markets on the Sustainability of Eastern Hardwood Forests	152,219	147,699	-4,520
Subtotal, Princeton	2,405,066	2,333,644	-71,422
Subtotal, West Virginia	6,810,697	6,775,509	-35,188
TOTALS, RESEARCH AND DEVELOPMENT	\$34,043,000	\$36,495,000	\$2,452,000



Northeastern Research Station
USDA Forest Service

How To Seek Assistance

For more information about the Northeastern Research Station, please contact the lead scientists in your state, found on the inside back cover, or the Station Director:

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