

FOREST-BASED RESEARCH IN THE NEFA STATES

Specific projects and areas of interest, November 2002

NEW YORK

CORNELL

Cooperative programs and institutes

Forest Biology and Management

Arnot Teaching and Research Forest

Cornell Agroforestry Working Group: conducts research on herbal medicinal plants American ginseng (*panax quinquefolium*) and golden seal (*hydrastis canadensis*), a variety of mushrooms, and sugar maple (*acer saccharum*) sap.

Sugar Maple and Extension Program: current research includes

- Butt fusion and electro-welding of polyethylene pipe mainlines

- Ginseng growth in a sugarbush

- Hydraulic lift and sugar maples

- Planting sugar maples: testing tree guards, weed mats, and fertilizer

- 1998 ice storm damage

- Small spout research

Human-Impacted Ecological Change

Biological Control of Non-Indigenous Plant Species: includes programs on purple loosestrife (*Lythrum salicaria*), garlic mustard (*Alliaria petiolata*), common reed (*Phragmites australis*), Eurasian watermilfoil (*Myriophyllum spicatum*), Waterchestnut (*Trapa natans*), and Japanese knotweed (*Fallopia japonica*). Also involved in release and monitoring programs for spotted knapweed (*Centaurea maculosa*) and leafy spurge (*Euphorbia esula*) at some field sites in northern New York State.

Gap Analysis

The New York Natural Heritage Program's Hudson River Biodiversity Inventory

Use of a Geographic Information System in the New York Important Bird Area Program

Assessment of Reptile and Amphibian Species Richness in New York as Influenced by Mapping Unit

New York Amphibian Reptile Atlas Project

Development of Maps of Known and Predicted Mammalian Distributions for the New York Gap Analysis Project

Resource Policy, Management, and Human Dimensions

Human Dimensions Research Unit: this unit is dominated by research that focuses on wildlife, especially white-tailed deer

SUNY- ESF

Student/faculty research for 2001-2002

Economic analysis of thinning diameter-limit stands

Developing automatic methods for preliminary forest stand maps from high-resolution imagery

Chestnut- numerous studies

Willow- numerous studies

The 1998 ice storm: Local government response

Early crown rebuilding on ice-damaged trees

Development of stump sprouts and root suckers from understory American beech following cutting

The 1998 ice storm and its effects on timber and recreational opportunities
Long-term white-tailed deer research at Huntington wildlife forest
Factors affecting the market distribution of hardwood roundwood from harvests in the southern tier of NY
Using CFI plots for remote sensing preference
Ice storm impact and management implications for a pine barrens in northeastern NY

VERMONT

UNIVERSITY OF VERMONT, SCHOOL OF NATURAL RESOURCES Ecology and Environmental Science

Titles of current research

Terrestrial Ecology

Evaluation and confirmation of insect vectors of the Butternut canker fungus
Identification of potential insect vectors of the Butternut canker fungus
Forest health monitoring: proposal to evaluate unexplained defoliation of ash and other hardwoods
Ecological impact of the January ice storm on butternut and associated tree species in the Champlain basin of northwestern Vermont
Insects and their relationships with tree diseases: emphasis on the potential insect vectors associated with the Butternut canker fungus
Ambassadors for the environment program
Westford Woods sustainable forestry project
Assessment of fungal flora associated with early stages of decomposition of fallen hardwood debris following the ice storm of 1998
Wildlife monitoring, Green Mountain national forest
Changes in the genetic structure and diversity of forest ecosystems as a result of forest management practices
Mechanism of cold tolerance response of forest trees to environmental stress
Interactive acid mist/global change-induced freezing injury: membrane-associated calcium as a potential mediator
Determining the current state-of-knowledge of fall foliage color development
Genetics of black bear populations in Vermont: application of non-invasive techniques
Population ecology of bobcats at the welder refuge: a genetic analysis
Impacts of roads on the sustainability of northern forest lands
Methane exchange in northern wetlands, Vermont
Estimating carbon exchange in northern ecosystems using ENVISAT
Mapping northern ecosystems with polder: applications for circumpolar methane exchange
NADP/NTN precipitation monitoring at proctor research center
Ultraviolet radiation monitoring for northern Vermont
Burlington EMPACT project-community-based environmental monitoring in the Burlington ecosystem
Quantifying and interpreting "contextual" interaction in forested ecosystems
Nutrient dynamics in experimental forest ecosystems

Human dimensions

Wood drying for value-added products
Character marked wood furniture: opportunities for sustainable rural community development and forestry
Boundaries, institutional arrangements, and protection of the northern forest of New England

Special forest products: strategies to integrate sustainable forest management into economic development plans and practices

Spatial analysis and modeling

A design for conservation of biological diversity based on physical diversity of the landscape

Vermont biodiversity project

Mapping conserved lands in Vermont

Land conservation planning in Lewis creek watershed

Mapping boreal wetlands using synthetic aperture radar satellite data

Cultural landscape report/forest management plan for the Marsh-Billings-Rockefeller National Park

VERMONT MONITORING COOPERATIVE

General Fact Sheets available

Biophysical Regions in Vermont

Pine Mountain Biodiversity Project

Atmospheric Fact Sheets

Atmospheric Integration Research Monitoring Network

Basic Meteorological Monitoring

Clean Air Status and Trend Network (CASTNet)

Cloudwater chemistry on Mount Mansfield

Vermont Acid Precipitation Monitoring Program

Surface Water Fact Sheets

Biological and Chemical Survey of Selected Surface Waters in Lye Brook Wilderness Area

Terrestrial Fauna Fact Sheets

Amphibian Survey and Monitoring

Bicknell's thrush population demographics and ecology

Forest Bird Surveys

Insect Diversity on Mount Mansfield

Terrestrial Flora Fact Sheets

Evaluating crown canopy changes in ice damaged forests by image analysis

Forest Environmental Monitoring (Canopy Tower)

Forest Health Monitoring

Forest Pest Monitoring

Landscape fall color and leaf drop monitoring

Ozone Bioindicator Plant Monitoring

Tree Phenology Monitoring

NATURAL AREAS CENTER

The University of Vermont owns and manages a system of nine natural areas. The Natural Areas Center's research activities include: developing strategies for the protection and management of natural areas, specifically those used for research and educational activities; promoting, demonstrating, and communicating low impact field research and teaching techniques to faculty, students, and others; identifying appropriate land protection tools and testing various management approaches for sensitive landscapes; and designing the most effective information and training delivery systems for the diversity of participants in land conservation.

NEW HAMPSHIRE

UNIVERSITY OF NEW HAMPSHIRE

I could not access this information. It is not compiled and they have no intention of doing so in the future. Questions regarding specific research areas should be directed to faculty members in various departments University-wide.

MAINE

UNIVERSITY OF MAINE

COOPERATIVE FORESTRY RESEARCH UNIT- *current research*

Silviculture

Maine Commercial Thinning Research Network

Austin Pond: Long-term effects of herbicides and precommercial thinning on the spruce-fir stand development

Hardwood Silviculture Research Subcommittee- goal is to develop:

improved vegetation management strategies for understory vegetation (including diseased beech, striped maple, and other interfering plant species) to promote the regeneration and growth of desirable hardwood species,

improved silvicultural strategies to regenerate, rehabilitate, or increase the productivity of stands that have been high-graded or subjected to diameter-limit cutting,

effective intermediate treatments for young, evenaged stands of northern hardwoods to

improved species composition, stem quality, growth, and shorten sawlog rotations,

improved silvicultural strategies for growing and maintaining quality northern hardwoods as an integral component of mixedwood stands.

Silviculture research priorities for enhancing Maine's wood supply

Seasonal tolerance of red spruce and balsam fir to herbicides

Water Quality

Effect of buffer and filter strips on water quality and aquatic biodiversity

Wildlife & Biodiversity

Patch retention as a tool for maintaining biodiversity in a northeastern industrial forest (see Manomet)

Marten habitat supply assessment

COLLEGE OF NATURAL SCIENCES, FORESTRY, AND AGRICULTURE

Areas of Study

Marine Invertebrates

Gulf of Maine

Extrusion technology

Super Larch

Managing the Lynx in Maine

Long-term look at Maine's forests

Remote Sensing

Wildlife Forensics

Wood Science

Forest Ecosystem Research Program

Vegetation Diversity in Gap Environments

Interactions Among Vegetation, Salamanders and Arthropods

Downed Woody Material Dynamics

Spatial Distribution of DWD

Forest Stand Structure

MAINE AGRICULTURE AND FOREST EXPERIMENT STATION

Research papers published after 1998

Wood properties of red pine (Pinus resinosa Ait.)

Public preferences for timber harvesting on private forest land purchased for public ownership in Maine

Designing effective environmental labels for forest products: Results of focus group research

Cooperative Forestry Research Unit 2000 Annual Rep

Investigations into the potential of measuring biodiversity in Maine's forests with Forest Inventory and Analysis data

Methods for evaluating carbon fractions in forest soils: A review

Maine's forest area, 1600-1995: Review of available estimates

Farm Tractors in the Woods: A Handbook Detailing the Requirements of the Occupational Safety and Health Administration

4th Annual Munsungan Conference Proceedings: Forest Health

A long-term study of an oak pine forest ecosystem: A brief overview of the Holt Research Forest

Northeastern paper mill towns economic trends and economic development responses

YALE SCHOOL OF FORESTRY AND ENVIRONMENTAL STUDIES

Yale Forests Research Abstracts 2002

Examining the effects of different kinds of timber harvesting on stem growth and financial productivity in southern New England mixed hardwood forests. Using destructive sampling and chronosequence techniques to examine changes in stand developmental pathways.

Seedling leaf morphological and physiological plasticity in response to shade. A study of within genera comparisons of understory and canopy tree species for southern New England.

Recruitment dynamics of canopy tree seedling cohorts in understory environments of a topographic catena.

Response of six canopy tree species to microsites across a range of Southern New England soils.

Pattern and process of floristic diversity in relation to microsite and disturbance.

Monitoring long term trends in floristics across forest landscapes in Southern New England.

Regeneration dynamics across various shelterwood treatments

Change in floristics with fire in a savannah woodland system.

Location and site classification of old-growth stands in southern New England

Do intercohort mycorrhizal networks influence seedling performance?

Investigating the response of white-footed mice (Peromyscus leucopus) to habitat loss: Insights from a behavioral approach.

Explaining the causes of animal aggregation using movement analysis of a forest fungivore.

Blood is Thicker than Water: The Importance of Kin Structure and Variation on the Population Dynamics of Wood Frogs. (Rana sylvatica)

Oviposition choice by a chrysomelid beetle in common garden enclosures

Land-use history of Yale-Myers Forest, with an emphasis on the agricultural period ca. 1730-1930 and its effects on the structure and composition of the forest to the present day.
A field experiment to test whether herbivore body size and associated predation risk can affect the strength of food web interactions.
Annual monitoring of amphibian populations at Yale-Myers Forest.
Wetland urbanization gradients and vector borne diseases, aka "Disease Survey".
Amphibian population response to whole-pond manipulations of canopy, nutrient concentration, and parasite density.
Adaptive behavior and pathogen transmission dynamics.
Predicting species interactions at large spatial scales. Measurement of reaction norms in populations of pond-breeding spotted salamander larvae, (*Ambystoma maculatum*), in response to a latitudinal gradient in predation risk by marbled salamanders, (*Ambystoma opacum*).
Archeological survey of Native American sites on the Ashuelot River, Swanzey, NH.
Photo-documentation of long-term stand development processes.

USDA FOREST SERVICE NORTHEASTERN RESEARCH STATION

Selected publications

Communicating the role of silviculture in managing the national forests, 1997.
Applied ecosystem management on nonindustrial forest land, 1997
Proceedings, USDA interagency gypsy moth research forum 1997

Research themes

The Role of Environmental Stress on Tree Growth and Development
Methods for Measurement, Analysis, and Modeling of Forest Growth and Structure
Quantitative Methods for Modeling Forest Ecosystems
Ecology and Management of Northern Forest Ecosystems
Wildlife and Fish Habitat Relationships in New England Forests
Ecological Processes: A Basis for Managing Forests and Protecting Water Quality in New England
Sustainable Forest Ecosystems in the Central Appalachians
Integrating the Ecological and Social Dimensions of Forest Ecosystem Management
Role of Forest Insect Biology and Biocontrol in Maintaining Forest Health
Pathology and Microbial Control of Insects that Impact the Health of Eastern Forests
Disturbance of Eastern Forest Ecosystems by Stressor/Host/Pathogen Interactions
Genetics and management of invasive forest insect pests, diseases, and beneficial fungi
Disturbance Ecology and Management of Oak-Dominated Forests
Multiple Stress Interactions and their Effects on Forest Health and Sustainability
Efficient Use of the Northern Forest Resource
Systems Analysis to Evaluate Alternative Harvesting Strategies
Forest Inventory and Analysis Forest Health Monitoring
Economics for Eastern Forest Use
The influence of markets on the sustainability of eastern hardwood forests
Effects of Urban Forests and their Management on Human Health and Environmental Quality

HUBBARD BROOK RESEARCH FOREST AND FOUNDATION

The *Futures Assessment Project* seeks to improve communication and information exchange between Hubbard Brook scientists and policy makers, land managers and the environmental community and to promote public awareness of HBES research and resources, and their societal implications. Science Links™ is the vehicle to do this- the first project addresses the ecological

effects of acid rain in the northeastern United States. Results from this will include: a peer-reviewed scientific paper, a general audience report that translates the findings for policy makers, a one to two-page statement of findings (if the results are amenable to this approach) to be endorsed by a larger group of scientists, a media/public communications training workshop for scientists in preparation for meetings and briefings with policy makers, media and the public, and a series of public briefings that will be held to disseminate the findings directly to policy makers, including presentations to the Northeastern U.S. governors, Congressional delegation and leaders in conservation and industry.

Current Research at Hubbard Brook (major projects)

- Calcium* watershed addition
- Animal* population and community studies
- Ice* storm effects on forest and aquatic ecosystems
- Hubbard Brook* sandbox studies
- Snow* depth, soil frost and nutrient loss
- Stream* ecosystem research
- Watershed 5* - whole tree harvest
- Transport* and fate of trifluoroacetate

Research by Discipline

Vegetation

- Long-term changes in the calcium concentration of wood fern fronds
- Regional Sugar Maple Study
- Spatial patterns of tree species abundance

Soil

- A Spatial Model of Soil Parent Material
- Accumulation and Depletion of Base Cations in Forest Floors
- Forest Floor Organic Matter following Logging in Northern Hardwoods
- Is there missing S at the HBEF?

Hydrology

- Increasing Atmospheric CO₂ and Forest Water Use

Geology

- The bedrock geology of the Hubbard Brook Experimental Forest: Results of new 1:10,000 mapping
- Characterizing fractured rock hydrology in the Mirror Lake Watershed

MANOMET CENTER FOR CONSERVATION STUDIES

Northern Forest project:

- The influence of buffer and filter strip width on water quality and aquatic biodiversity
- Patch retention as a tool for maintaining biodiversity in a northeastern industrial forest