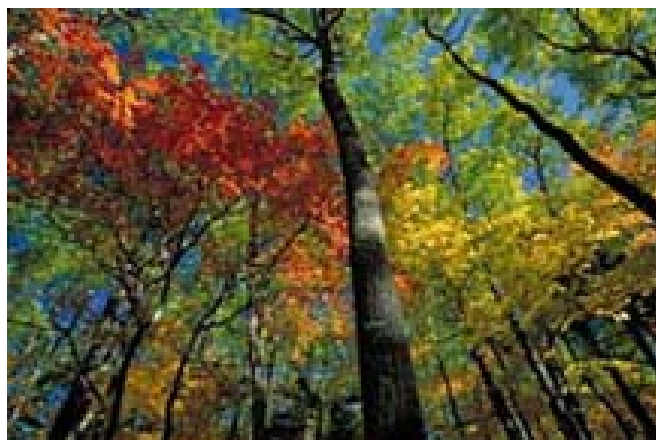


VIRGINIA TECH



DEPARTMENT OF FORESTRY



Annual Report 2006

A University Exemplary Department

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ANNUAL REPORT 2006

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***Other departments within the College are the Department of Fisheries and Wildlife Sciences, the Department of Geography, and the Department of Wood Science and Forest Products. Reports are available upon request.**

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INTRODUCTION

This annual report highlights accomplishments in teaching, research, and outreach in the Department of Forestry for calendar year 2006. This past year has been a time of challenge and opportunity, but through the myriad changes, the department remains one of the leading programs of its type and is poised to achieve even higher levels of excellence in the future.

There were several personnel changes in 2006. Following Dr. Joseph Roggenbuck's retirement as Professor in the forest recreation area, Dr. Marc Stern joined the faculty as Assistant Professor of Natural Resources Education and Communication in July, 2006. A cluster hire opportunity in the geospatial analysis area resulted in the hiring of Dr. Valerie Thomas—currently a postdoctoral fellow at Queen's University in Ontario, Canada—as an Assistant Professor in the Forestry Department starting August 10, 2007. Dr. James Johnson, Associate Dean and Extension Specialist in Forestry, resigned for a position at Oregon State University; we have an ongoing search for an entry-level position as extension specialist in forestry. In addition, Liz Etherington, Research Associate in Amy Brunner's molecular genetics lab, resigned; this position has been filled by Xiaoyan Sheng. Karen Hockett joined the Department of Forestry as Project Associate in the area of natural resources recreation, filling the position previously held by Aurora Moldovanyi. Dr. David Jones joined the Forest Nutrition Cooperative as a Postdoctoral Associate working with Professor Tom Fox on relationships between wood quality and silviculture. Spencer Riddile was hired as Natural Resources IT Specialist.

The campus in Blacksburg continues to grow and change. Construction was completed on the new Agriculture/Natural Resources building, now named Latham Hall, and we moved into the Latham Hall laboratories in August, 2006. This contemporary plant science research facility contains laboratory space for research in soils, physiology, genetics, and biotechnology.

The department's educational programs continue to thrive. There were 462 undergraduates in the College of Natural Resources for Fall Semester 2006. Approximately 31% of those students who had decided upon a career path were in options associated with the Department of Forestry. There were 62 graduate students (50 full-time and 12 part-time) in our department Fall Semester 2006. We continue to have more qualified applicants to our graduate program every year than we have faculty, funds, and space to accommodate them.

Employment opportunities remain favorable for our graduates. Surveys taken each fall of individuals who graduated during the preceding academic year have consistently shown that the majority of our graduates are employed in professional positions or enrolled in graduate programs. In total, graduate students in the Department of Forestry and undergraduates in forestry majors completed

requirements for 2 Ph.D. degrees, 13 master's degrees, and 38 bachelor's degrees for the academic year of June, 2005, to May, 2006.

In 2001 a strategic plan for the Department of Forestry was finalized and distributed to various stakeholder groups. The university has updated its strategic plan, and the Department of Forestry has initiated an update to its current plan. Strategic plans provide useful blueprints as we continue in the new century, but successful implementation will require concerted effort and solid support from students, faculty, and administrators at Virginia Tech, as well as our alumni, friends, and clientele groups throughout the forestry community.

All things considered, 2006 was a highly successful year for the Department of Forestry; we look forward to the challenges and opportunities ahead.

A handwritten signature in black ink that reads "Harold E. Burkhart". The signature is written in a cursive, flowing style.

Harold E. Burkhart
Department Head
March, 2007

PERSONNEL

Faculty

Amacher, Gregory S., Professor (Adjunct Faculty, Department of Economics)

Ph.D., University of Michigan

Special Interests: Natural resource and environmental policy; public economics; econometrics; international forest development

Amateis, Ralph L., Senior Research Associate

M.S., University of Florida

Special Interests: Statistical techniques applied to forestry problems; growth and yield modelling

Aust, W. Michael, Professor

Ph.D., North Carolina State University

Special Interests: Impacts of forestry operations on soil and hydrology; ecology and management of forested wetlands and riparian areas; development and implementation of forestry best management practices

Barrett, Scott M., Extension Associate

M.S., Virginia Polytechnic Institute and State University

Special Interests: Logger training and education

Blinn, Christine E. Postdoctoral Associate.

Ph.D., Virginia Polytechnic Institute and State University

Special Interests: Remote sensing; geographic information systems; statistical applications for natural resource inventory and management

Brunner, Amy M., Associate Professor

Ph.D., Oregon State University

Special Interests: Genomics of tree development, ecophysiology, and adaptation; molecular genetics of tree maturation, flowering, and crown architecture; epigenetic mechanisms and small RNAs in trees; long-distance signaling in trees; tree biotechnology

Burger, James A., Professor

Ph.D., University of Florida

Special Interests: Forest soil and site productivity; forest tree nutrition; pine plantation silviculture; restoration ecology; agroforestry

Burkhart, Harold E., University Distinguished Professor and Head, Department of Forestry

Ph.D., University of Georgia

Special Interests: Development of growth and yield prediction techniques; application of statistical methods to forest measurement problems

Carlson, Colleen A., Research Associate

M.S., University of the Witwatersrand, South Africa

Special Interests: Silvicultural systems; methods of data analysis in forestry research

Chojnacky, David C., USDA Forest Service Research Enterprise Unit and Adjunct Faculty

Ph.D., Colorado State University

Special Interests: Forest inventory with emphasis on mensuration; model-based estimators and sampling techniques for applications to carbon sequestration; forest health; wildlife habitat; dryland forests

Clark, Neil A., Extension Agent, Agriculture and Natural Resources
M.S., Virginia Polytechnic Institute and State University
Special Interests: Landowner, logger, youth, and professional education; land use issues; sustainable forestry; coastal ecology; forest products; forest health, urban interface – small-scale forestry; human dimensions

Copenheaver, Carolyn A., Assistant Professor
Ph.D., Pennsylvania State University
Special Interests: Dendrochronology; land-use history; vegetation distribution; stand dynamics

Cox, Karen G., Extension Agent, Agriculture and Natural Resources
M.S., Purdue University
Special Interests: Sustainable forest management; sustainable development; human relationships with ecosystems

Dan, Yinghui, Research Assistant Professor, Institute for Sustainable and Renewable Resources, Institute for Advanced Learning and Research, and Adjunct Faculty
Ph.D., Michigan State University
Special Interests: Discovery and development of the cutting edge technologies for plant genetic engineering and tissue culture; functional genomics

Day, Susan D., Research Assistant Professor
Ph.D., Virginia Polytechnic Institute and State University
Special Interests: Urban forestry, including urban runoff mitigation, urban soils (rehabilitation and modeling effects on urban forest canopy), construction damage, buried root systems, urban rhizosphere

Downing, Adam K., Extension Agent, Agriculture and Natural Resources
M.S., Pennsylvania State University
Special Interests: Non-industrial private forest landowner issues; sustainable timber harvesting; interface forestry; urban forestry; wildlife management; land conservation

Egertsdotter, Ulrika, Associate Professor
Ph.D., Swedish University of Agricultural Sciences
Special Interests: Applications of biotechnology to forestry practices; molecular biology of developmental processes; clonal propagation, particularly somatic embryogenesis; Christmas tree propagation; molecular regulation of the wood formation process

Eisenbies, Mark H., Postdoctoral Associate
Ph.D., Virginia Polytechnic Institute and State University
Special Interests: Soil-site responses to harvesting disturbance and site preparation; forest watershed land use and flooding

Etherington, Elizabeth R., Research Associate (resigned October, 2006)
B.A., Oregon State University
Special Interests: Genomics research

Fisher, K. Jason, Extension Agent, Agriculture and Natural Resources
M.S., Virginia Polytechnic Institute and State University

Flinn, Barry, Director, Institute for Sustainable and Renewable Resources, Institute for Advanced Learning and Research, and Adjunct Faculty
Ph.D., University of British Columbia
Special Interests: Use of genomics to identify genes associated with quality traits and characteristics for forestry and agricultural species

Fox, Thomas R., Associate Professor
Ph.D., University of Florida
Special Interests: Forest fertilization and tree nutrition; forest soils; silviculture of southern pine plantations and Appalachian hardwoods; silvicultural practices to restore productivity and health of forest ecosystems; sustainability of managed forests

Fujino, Takeshi, Postdoctoral Associate
Ph.D., Kyoto University

Fuller, Leslie G., Senior Research Associate, College of Natural Resources
M.S., Michigan Technological University
Special Interests: Integration of computer applications into instruction; artificial intelligence; geographic information systems; multimedia applications

Gagnon, Jennifer L., Extension Associate and Coordinator, Virginia Forest Landowner Education Program
M.S., University of Florida
Special Interests: Landowner education; shortleaf and longleaf pine silviculture; uneven-aged management

Harris, J. Roger, Associate Professor, Department of Horticulture, and Adjunct Faculty
Ph.D., Cornell University
Special Interests: Tree establishment issues; landscape contracting; urban forestry

Henning, Jason G., Postdoctoral Associate (resigned August, 2006)
Ph.D., Virginia Polytechnic Institute and State University
Special Interests: Emerging technologies and technology transfer for developing ecological assessments of forests; statistical methods for evaluating and testing forest models; hybrid growth and yield/process models

Hockett, Karen S., Project Associate
M.S., Virginia Polytechnic Institute and State University

Hull, R. Bruce, Professor
Ph.D., Virginia Polytechnic Institute and State University
Special Interests: Public ecology and sustainability; human dimensions of natural resource management; negotiation of acceptable environmental quality; forest fragmentation and urbanization; recreation

Johnsen, Kurt D., Project Leader, USDA Forest Service, and Adjunct Faculty
Ph.D., University of Georgia
Special Interests: Quantifying and modeling carbon sequestration of natural and managed forests

Johnson, James E., Professor and Associate Dean - Outreach, College of Natural Resources (Resigned September, 2006)
Ph.D., Virginia Polytechnic Institute and State University
Special Interests: Hardwood and pine silviculture; forest soils; impacts of forest management activities on site productivity; extension forestry

Jones, P. David, Postdoctoral Associate
Ph.D., University of Georgia
Special Interests: Examination of wood quality and how it is affected by silviculture

Jones, Robert H., Professor, Department of Biology; courtesy appointment in the Department of Forestry
Ph.D., State University of New York
Special Interests: Hardwood regeneration; forest ecology

Kelly, J. Michael, Professor and Dean, College of Natural Resources
Ph.D., University of Tennessee
Special Interests: Forest soils and the quantitative mechanistic modeling of tree nutrition

Keyser, Patrick D., Regional Wildlife Biologist, MeadWestvaco Corporation, and Adjunct Faculty
Ph.D., Clemson University

Kirwan, Jeffrey L., Associate Professor and Extension Specialist
Ph.D., University of Virginia
Special Interests: 4-H and youth education; urban and community forestry; forest and wildlife ecology

Lakel, William A., III, Research Associate/Instructor
M.S., Virginia Polytechnic Institute and State University
Special Interests: Minimizing impacts of industrial forestry operations on soil/site and water quality in forested watersheds through proper use of best management practices, harvesting technology, and road construction and maintenance

Lawson, Steven R., Assistant Professor
Ph.D., University of Vermont
Special Interests: Management of visitor use in parks and protected areas; normative recreation research; computer simulation modeling of recreation behavior; human dimensions of natural resource management

Li, Zhiwu, Research Assistant Professor, Institute for Sustainable and Renewable Resources, Institute for Advanced Learning and Research, and Adjunct Faculty
Ph.D., University of Idaho
Special Interests: High-throughput transformation processes for different kinds of plants; mechanisms of transgene silencing; global gene expression profiling and candidate gene identification and characterization

Loftis, David L., Project Leader, USDA Forest Service, and Adjunct Faculty
Ph.D., North Carolina State University

Marion, Jeffrey L., Unit Leader/Scientist, Cooperative Park Studies Unit, USGS Patuxent Wildlife Research Center, and Adjunct Faculty
Ph.D., University of Minnesota
Special Interests: Recreation resources management; recreation ecology; park and wilderness management; ecotourism management

McGee, John, Assistant Professor and Geospatial Extension Specialist
Ph.D., University of Massachusetts-Amherst
Special Interests: Natural resource management; geospatial applications; technology transfer

Merry, Frank D., Research Scientist in International Forestry and Adjunct Faculty
Ph.D., University of Florida
Special Interests: Forest economics

Miller, Patrick A., Professor and Head, Department of Landscape Architecture; courtesy appointment in the Department of Forestry
Ph.D., University of Michigan
Special Interests: Landscape aesthetics

- Moldovanyi, Aurora, Research Associate (resigned July, 2006)
 M.S., West Virginia University
 Special Interests: Recreation, parks, and tourism resources
- Mortimer, Michael J., Assistant Professor
 Ph.D., University of Montana; J.D., Pennsylvania State University
 Special Interests: Federal and state forestry regulation; public land management; property rights; public administration; sustainable forestry
- Nelson, Ross F., Physical Scientist, NASA/Goodard Space Flight Center, and Adjunct Faculty
 Ph.D., Virginia Polytechnic Institute and State University
 Special Interests: Use of airborne laser data to characterize the forest canopy and to estimate forest biomass, volume, and carbon; use of AVHRR and Landsat digital data to monitor tropical and subtropical forest conversion
- Oderwald, Richard G., Professor and Associate Dean for Undergraduate Programs
 Ph.D., University of Georgia
 Special Interests: Sampling for forest resource populations; statistical distributions in forest populations
- Peer, Kyle R., Research Associate and Superintendent, Reynolds Homestead Forest Resources Research Center
 M.S., University of Maine, Orono
 Special Interests: Vegetative propagation; clonal forestry; nursery and greenhouse production; tree breeding
- Prisley, Stephen P., Associate Professor
 Ph.D., Virginia Polytechnic Institute and State University
 Special Interests: Quantitative and spatial analysis of natural resources for management planning, including spatial harvest scheduling, inventory projection, and forest carbon modeling
- Prysbay, Michelle D., Extension Associate and Coordinator, Virginia Master Naturalist Program
 M.S., University of Minnesota
 Special Interests: Citizen science; long-term ecological monitoring; monarch butterfly ecology; science education
- Radtke, Philip J., Associate Professor
 Ph.D., University of Minnesota
 Special Interests: Assessment and modeling of forest resources; evaluating models used in forestry and ecology; acquisition, management, and analysis of data
- Reynolds, Marion R., Jr., Professor; joint appointment with Department of Statistics
 Ph.D., Stanford University
 Special Interests: Statistical quality control; validation of simulation models; applications of statistics to natural resource problems
- Robertson, David P., Visiting Assistant Professor
 Ph.D., Virginia Polytechnic Institute and State University
 Special Interests: Public ecology; urban ecology; civic environmentalism; sustainable community development; history and philosophy of science; human dimensions of natural resource management; environmental design and planning
- Roggenbuck, Joseph W., Professor (retired June, 2006)
 Ph.D., Utah State University
 Special Interests: Natural resource recreation behavior; recreation management, particularly wilderness and backcountry recreation; planning and evaluation of park interpretation

Salom, Scott M., Associate Professor, Department of Entomology; courtesy appointment in the Department of Forestry
Ph.D., University of British Columbia
Special Interests: Biology, behavior, chemical ecology, and integrated pest management of forest insects

Sampson, David A., Research Scientist
Ph.D., Colorado State University
Special Interests: Ecophysiology; public awareness of environmental issues; environmental education

Schoenholtz, Stephen H., Professor and Director of the Virginia Water Resources Research Center
Ph.D., Virginia Polytechnic Institute and State University
Special Interests: Forest management impacts on water and soil quality; restoration of degraded ecosystems; ecology and management of forested wetlands and riparian zones; biogeochemistry; criteria and indicators of sustainable forest management

Scrivani, John A., Research Forester, Virginia Department of Forestry, and Adjunct Faculty
Ph.D., Oregon State University
Special Interests: Forest management

Seiler, John R., The Honorable and Mrs. Shelton H. Short, Jr., Professor of Forestry
Ph.D., Virginia Polytechnic Institute and State University
Special Interests: Forest tree physiology; physiological applications in silviculture; multimedia, computer innovations for teaching forestry

Shaffer, Robert M., Charles Nettleton Professor of Forestry and Extension Specialist
Ph.D., University of Missouri
Special Interests: Forestry operations; timber harvesting; wood procurement; industrial forestry

Sheng, Xiaoyan, Research Associate
M.S., University of Saskatchewan

Stern, Marc J., Assistant Professor
Ph.D., Yale University
Special Interests: Human dimensions of natural resource policy and management; environmental communications; protected areas management; international conservation; natural resource management effectiveness; attitudes vs. actions; public responses to natural resource management; evaluation of environmental education and other outreach programs; research methods

Sullivan, Jay, Professor
Ph.D., University of California, Berkeley
Special Interests: Forest resource economics and management; regional economics; forest landowner behavior and incentives

Visser, J. M. (Rien), Associate Professor
Ph.D., University of Bodenkultur, Vienna, Austria
Special Interests: Forest engineering; cable logging; harvesting systems analyses; performance monitoring; forest best management practices; steep terrain harvesting; watershed management and flood risk analyses; bio-energy development

Vose, James M., Project Leader, USDA Forest Service, and Adjunct Faculty
Ph.D., North Carolina State University
Special Interests: Forest ecology

Wang, Chieh-Ting, Postdoctoral Associate
Ph.D., University of Georgia

Wiseman, P. Eric, Assistant Professor
Ph.D., Clemson University
Special Interests: Landscape tree establishment and maintenance; tree physiological responses to arboricultural treatments; urban soils; urban forest ecophysiology

Worrell, William C., Extension Agent, Agriculture and Natural Resources
B.S., Virginia Polytechnic Institute and State University
Special Interests: Sustainable forest management and timber harvesting; alternative income opportunities from forestland; wildland urban interface; forestry and natural resource educational programs for youth, landowners, loggers, and professionals

Wynne, Randolph H., Associate Professor
Ph.D., University of Wisconsin-Madison
Special Interests: Application of remote sensing to forestry; natural resource management; environmental monitoring; long-term ecological research; earth system science

Yancey, Matthew W., Extension Agent, Agriculture and Natural Resources
M.F., Virginia Polytechnic Institute and State University
Special Interests: Educating private forest landowners in sustainable forest management; educating youth and the general public in the importance of forestry, forestland, the urban forest, and related natural resources

Zedaker, Shepard M., Professor
Ph.D., Oregon State University
Special Interests: Regeneration silviculture; chemical silviculture; vegetation management; quantitative ecology and stand dynamics

Emeriti

Adams, Robert E.
Ph.D., State University of New York-Syracuse
Special Interests: Physiological applications in silviculture; international forestry

Buhyoff, Gregory J., Julian N. Cheatham Professor of Forestry
Ph.D., University of Michigan
Special Interests: Visual assessment and visual impact modeling; computer applications; philosophy and history of science; human dimensions of natural resource management

Hall, Otis F.
Ph.D., University of Minnesota
Special Interests: Forest management; economic impact of forests; hardwood quality production; policy; computer use in forestry

Haney, Harry L., Jr., Garland Gray Professor of Forestry and Extension Specialist
Ph.D., Yale University
Special Interests: Forestry investment analysis; management of non-industrial private timberland; timber income and estate taxation; consulting forestry business; local regulation and conservation easements

Hosner, John F.
Ph.D., State University of New York-Syracuse
Special Interests: Silviculture; ecology

Klemperer, W. David, Professor
Ph.D., Oregon State University
Special Interests: Forest investment analysis and taxation; optimizing timber management regimes; risk analysis

McElfresh, William A.
M.S., University of Michigan
Special Interests: 4-H and youth conservation; natural resource and historical interpretation; environmental education; outdoor recreation

McElwee, Robert L.
Ph.D., North Carolina State University
Special Interests: Forest management; industrial forestry; tree improvement

Smith, David Wm.
Ph.D., Iowa State University
Special Interests: Silviculture of Appalachian hardwoods; impacts of silviculture on soil nutrients, site quality, and floral diversity; nutrient cycling in forest ecosystems

Walbridge, Thomas A., Jr.
Ph.D., University of Michigan
Special Interests: Economic analysis and evaluation of mechanized forestry operations

Wisdom, Harold W.
Ph.D., State University of New York-Syracuse
Special Interests: International trade and investment; international forest policy

Visiting Scholars and Lecturers During 2006

Arguedas, Felix Rubén – Visiting Scholar, Facultad de Ciencias Agroalimentarias, University of Costa Rica, San José, Costa Rica

Brooks, Ervin – Regional Forest Engineer, USDA Forest Service, Asheville, NC

Cale, Alissa – Procurement Forester, Weyerhaeuser Timberlands, New Bern, NC

Cathey, Joel – Procurement Manager, Ontario Hardwoods Inc., Keysville, VA

Choi, Jungkee – Visiting Scholar, Kangwon National University, Korea

Folden, Sam – Procurement Forester, Georgia-Pacific Corporation, Suffolk, VA

Frederickson, Todd – Professor, Ferrum College, Ferrum, VA

Gallagher, Thomas – Assistant Professor, Auburn University, Auburn, AL

Garcia, Oscar – Visiting Scholar, University of Northern British Columbia, Canada

Garrison, Carl – State Forester, Virginia Department of Forestry, Charlottesville, VA

Gee, John – Procurement Forester, MeadWestvaco, Appomattox, VA

Guyette, Richard – Professor, University of Missouri, Columbia, MO

Hancock, John – Procurement Manager, MeadWestvaco, Covington, VA

Harris, Julianna – Procurement Forester, Weyerhaeuser Timberlands, Plymouth/Washington, NC

Harris, Ted – President, 500-Year Forest Foundation, Lynchburg, VA

Hincher, Mike – Senior VP–Forest Operations, The Forestland Group, LLC, Abingdon, VA

Hessl, Amy – Assistant Professor, West Virginia University, Morgantown, WV

Itami, Robert – President, GeoDimensions Inc., Melbourne, Australia

Kaye, Margot – Assistant Professor, Pennsylvania State University, University Park, PA

Koskela, Erkki – Professor, University of Helsinki, Finland

Loving, Easton – Procurement Forester, MeadWestvaco, Appomattox, VA, and Member, Virginia Board of Forestry

Mason, Euan – Associate Professor, School of Forestry, University of Canterbury, New Zealand

McLaughlin, Sandy – Oak Ridge National Laboratory, Oak Ridge, TN

Mehtatalo, Lauri – Finnish Forest Research Institute, Helsinki, Finland

O'Brien, Obie – Forest Engineer, USDA Forest Service, Helensville, MO

Ollikainen, Markku – Professor, University of Helsinki, Finland

Owens, Terry – Harvesting Manager, Wagner Forestry, Bluefield, WV
Poirot, Matt – Water Quality Specialist, Virginia Department of Forestry, Charlottesville, VA
Smith, Guy – Chief–Marketing and Technology Transfer, Canadian Forest Service, Sault Ste. Marie,
Ontario, Canada
Smith, Kevin – Veneer Log Buyer, International Veneer Corp., Elkins, WV
South, David – Professor, School of Forestry and Wildlife Sciences, Auburn University, Auburn, AL
Wang, Jinxing – Assistant Professor, West Virginia University, Morgantown, WV
Woodall, Claiborne – Western District Manager, Division of Natural Heritage, Department of Conservation
and Recreation, Abingdon, VA
Wright, Jeff – Manager of Business Development, ArborGen, LLC, Summerville, SC

Technical Personnel

Baldassaro, Paige M., M.S., Virginia Polytechnic Institute and State University (resigned May, 2006)
Geospatial Extension Program

Jackson, Meral L., M.S., Virginia Polytechnic Institute and State University (resigned August, 2006)
Forest Biology

Mitchem, David O., B.S., Virginia Polytechnic Institute and State University
Forest Biology

Peterson, John A., M.S., Virginia Polytechnic Institute and State University
Forest Biology

Riddile, J. Spencer, B.S., Virginia Polytechnic Institute and State University
Natural Resources IT Support Specialist

Roberts, E. Talcott, Jr., B.S., Virginia Polytechnic Institute and State University
Industrial Forestry Operations

Sawyers, B. Clay, B.S., Ferrum College
Forestry Research Manager, Reynolds Homestead Forest Resources Research Center

Weber, Lon A., B.S., Colorado State University
College of Natural Resources

Clerical Personnel

Eanes, Laura
Hollandsworth, Kathryn
Linkous, Connie
Sherman, Tracey
Snow, Suzanne

Department of Forestry Advisory Board

Forest Resources Management Committee

Bush, C. E. (Ted) – Bush & Cooney, LLC, Charlotte, NC
Carroll, John – Virginia Department of Forestry, Charlottesville, VA
Crowe, Linda – The Nature Conservancy, Charlottesville, VA
Duff, Ann – Smurfit-Stone Container Corporation, West Point, VA
Keefer, Brent – Hancock Timber Resource Group, Charlotte, NC
Kitchen, Ollie – MeadWestvaco, Covington, VA
Kuykendall, Jim – Glatfelter Pulp Wood Company, Spotsylvania, VA
Scheerer, Greg – MeadWestvaco, Appomattox, VA
Tinsley, Marvin – Greif, Amherst, VA
Turner, Harrell – Turner Forestry, LLC, Branchville, VA

Natural Resource Recreation and Education Committee

Davy, John – Virginia Department of Conservation and Recreation, Richmond, VA
Kutruff, Julie – Northern Virginia Regional Park Authority, Fairfax Station, VA
Schiffer, Cynthia – USDA Forest Service, Blacksburg, VA
Stubbs, Christopher – Cedar Creek & Belle Grove National Historical Park, Middletown, VA

Urban Forestry Committee

Jones, Alan – Bartlett Tree Experts, Charlottesville, VA
Milhous, Ed – TreesPlease, Haymarket, VA
Parsons, Brigitte – Dabney S. Lancaster Community College
Revell, Paul – Virginia Department of Forestry, Charlottesville, VA
Sigmon, Kevin – Appalachian Power, Glade Spring, VA

Ex-Officio Members

Garrison, Carl – Virginia Department of Forestry, Charlottesville, VA
Howe, Paul – Virginia Forestry Association, Richmond, VA
Hyzer, Maureen – USDA Forest Service, Roanoke, VA
Maroon, Joseph – Virginia Department of Conservation and Recreation, Richmond, VA
Roussopoulos, Peter – USDA Forest Service, Asheville, NC

TEACHING

The College of Natural Resources (CNR) is firmly committed to excellence in teaching. Our stated educational goals are: (1) to educate high-quality professionals who can function effectively in entry-level positions and assume positions of ever-increasing responsibility throughout their careers; (2) to provide graduate programs that combine (a) a high-quality faculty, (b) a student body selected from the best undergraduate degree recipients in this country and abroad, and (c) courses offering the most advanced knowledge in order to produce outstanding researchers, educators, and practitioners; (3) to provide students not enrolled in the college's majors with an understanding of renewable natural resources so they can assume leadership roles and foster a rational conservation ethic within the general public; (4) to effectively disseminate knowledge and to provide a new program of public service to the college's constituencies which will enhance the benefits, goods, and services obtained from natural resources of the state and surrounding region.

Obviously, teaching is an extremely important part of the mission of the Department of Forestry, and students—defined in the broadest sense—are a principal constituent. All members of the faculty participate in the teaching program, which includes formal undergraduate and graduate on-campus instruction and a variety of extension courses including continuing education for professionals. Evaluations of these educational efforts continue to be outstanding. The overall evaluation for all formal courses taught by full-time departmental faculty in Fall Semester 2006 was 3.8 out of a possible 4.0.

The Department of Forestry now has two majors: Forestry and Natural Resource Conservation. Within the Forestry major, there are four options: forest resource management, industrial forestry operations, environmental resource management, and urban forestry. The Natural Resource Conservation major has three options: natural resource recreation, natural resources education (K-6), and natural resources science (6-12).

An important component of the forestry teaching program for undergraduates is the month-long field camp which students attend in late spring of the junior year. At camp various skills and techniques which have been learned in classroom and laboratory sessions are given intensive application in the field. Also during this time students have an opportunity to interact on a one-on-one basis with faculty members and to develop the leadership and teamwork skills which will enhance their career success as professional foresters.

The department continues to emphasize the importance of written and oral communication at all levels. The college has an established Writing Improvement Program to which students are introduced in their freshman year. Students are required to write a major paper in at least one forestry course each semester. These papers are reviewed carefully for writing skills and communications effectiveness; rewriting is required where needed.

Undergraduate enrollment in the College of Natural Resources totaled 462 in Fall Semester 2006. Approximately 31% of the “decided” CNR undergraduates were enrolled in Department of Forestry options. Enrollment at the graduate level in the department was 50 full-time and 12 part-time students in Fall Semester 2006.

**Formal Courses Taught in 2006
Spring Semester**

Course Number	Course Name	Instructor(s)	Enrollment
FOR 2324	Dendrology Laboratory	J. R. Seiler	38
FOR 2514	Wildland Fire: Ecology and Management	S. M. Zedaker	29
FOR/LAR 2554	Nature and American Values	R. B. Hull	63
FOR 3216	Forest Measurements	P. J. Radtke	24
FOR 3224	Forest Measurements Field Laboratory (Spring Camp)	P. J. Radtke	22
FOR 3324	Silviculture Principles and Applications	T. R. Fox	23
FOR 3334	Silviculture Field Laboratory (Spring Camp)	S. M. Zedaker and others	22
FOR 3344	Forestry Field Studies	R. M. Shaffer	22
FOR 3434	Forest Management Field Laboratory (Spring Camp)	J. Sullivan, G. S. Amacher	22
FOR 3524	Environmental Interpretation	J. W. Roggenbuck	21
FOR 3534	Outdoor Recreation Field Studies	J. W. Roggenbuck	11
FOR 3544	Outdoor Recreation Management	S. R. Lawson	30
FOR 3724	Forest Boundaries and Roads	W. M. Aust, W. A. Lakel	21
FOR 3734	Timber Procurement	R. M. Shaffer	18
FOR 4114	Information Technology for Natural Resource Management	C. E. Blinn	27
FOR 4364	Advanced Silviculture and Forest Vegetation Management	S. M. Zedaker, T. R. Fox, U. Egertsdotter	10
FOR 4374	Forested Wetlands	W. M. Aust	10
FOR 4434	Forest Resource Policy	M. J. Mortimer	43
FOR 4444	Integrated Forest Management Practicum	J. Sullivan, R. B. Hull	30
FOR 4454	Urban Forest Management and Policy	P. E. Wiseman	4
FOR 4714	Harvesting Systems Evaluation	R. Visser	3
FOR 4974	Independent Study: Service Learning in Natural Resources Education	J. L. Kirwan	10
FOR 4974	Independent Study: GIS Applications in Forest Policy	S. P. Prisley	1
FOR 4974	Independent Study: Riparian Enhancement	C. A. Copenheaver	3
FOR 4974	Independent Study: Wildland Fire Ignition Operations	S. M. Zedaker	1
FOR 4994	Undergraduate Research: Forest Land Use Change in an Urbanizing Environment	R. H. Wynne	1
FOR/GEOG 5104	Seminar on Remote Sensing and GIS	R. H. Wynne, J. B. Campbell	16
FOR 5254	Remote Sensing of Natural Resources	R. H. Wynne	6
FOR 5354	Advanced Forest Soils	J. A. Burger	10
FOR 5374	Advanced Forest Ecology	C. A. Copenheaver	13

Course Number	Course Name	Instructor(s)	Enrollment
FOR 5416	Advanced Forest Management and Economics	J. Sullivan	5
FOR 5494	Natural Resource Research Procedures	J. M. Kelly	6
FOR 5974	Independent Study: Advanced Topics in Urban Forestry	P. E. Wiseman	2
FOR 5974	Independent Study: A Web-based Geographic Information System (GIS) for Virginia Tech Campus Trees	P. E. Wiseman	1
FOR 5974	Independent Study: Forest Measurements and Forest Inventory	R. G. Oderwald	3
FOR 5974	Independent Study: Recreation Behavior Simulation	S. R. Lawson	1
FOR 5974	Independent Study: Introduction to GIS	S. P. Prisley	1
FOR 5984	Special Study: Environmentally Sensitive Harvesting	R. Visser	7
GIA/PSCI 5364	Public Ecology (Virtual Campus)	D. P. Robertson	12

**Formal Courses Taught in 2006
Summer Sessions**

Course Number	Course Name	Instructor(s)	Enrollment
FOR 5384	Forest Biology and Ecology for Educators (Virtual Campus)	W. M. Aust, J. R. Seiler	9

**Formal Courses Taught in 2006
Fall Semester**

Course Number	Course Name	Instructor(s)	Enrollment
FOR 2214	Introductory Forest and Land Measurements	P. J. Radtke	46
FOR 2314	Forest Biology and Dendrology	J. R. Seiler	74
FOR 2324	Dendrology Laboratory	J. R. Seiler	89
FOR 2514	Wildland Fire: Ecology and Management	S. M. Zedaker	11
FOR/LAR 2554	Nature and American Values	R. B. Hull	58
FOR 2714	Introduction to Industrial Forestry Operations	R. M. Shaffer	7
FOR 3215	Forest Measurements	R. G. Oderwald	18
FOR 3314	Forest Ecology and Silvics	C. A. Copenheaver	23
FOR/HORT 3354	Urban Forestry and Arboriculture	P. E. Wiseman	24
FOR 3364	Survey of Forest Ecology and Management	S. M. Zedaker	40
FOR 3424	Forest Resource Economics	G. S. Amacher	21
FOR 3564	Outdoor Recreation Planning	S. R. Lawson	14
FOR 3714	Forest Harvesting	W. A. Lakel	21
FOR 4214	Forest Photogrammetry and Spatial Data Processing	R. H. Wynne	39
FOR 4354	Forest Soils and Hydrology	W. M. Aust, T. R. Fox	18
FOR 4424	Forest Resource Management	J. Sullivan	23
FOR 4514	Forest and Tree Pests	G. Griffin (PPWS), S. Salom (ENT)	24
FOR 4974	Independent Study: Environmental Education Service Learning	M. J. Stern	1
FOR 4974	Independent Study: Natural Resources Education Service Learning	M. J. Stern	5
FOR 4974	Independent Study: Leadership and Outreach in Natural Resources	J. R. Seiler	4
FOR 4994	Undergraduate Research: Alleycropping Systems	J. A. Burger	1
FOR 5004	Graduate Seminar	C. A. Copenheaver	18
FOR 5124	Law of Natural Resource Management	M. J. Mortimer	4
FOR 5224	Forest Biometry	H. E. Burkhart	8
FOR 5264/ GEOG 5364	GIS in Natural Resource Management	S. P. Prisley	26
FOR 5974	Independent Study: Hillslope Hydrology	S. H. Schoenholtz	1
FOR 5974	Independent Study: Professional Timber Operations	R. M. Shaffer	1
FOR 5974	Independent Study: Vector GIS Programming	S. P. Prisley	1
FOR 5974	Independent Study: Riparian Forest Restoration	W. M. Aust	2
FOR 5974	Independent Study: Advanced Forest Hydrology	W. M. Aust	1

Course Number	Course Name	Instructor(s)	Enrollment
FOR 5974	Independent Study: Fundamentals of GIS for Research	S. P. Prisley	1
ECON 4014	Environmental Economics	G. S. Amacher	120
NR 5984	Special Study	D. P. Robertson	8

RESEARCH

The overall research effort in 2006 involved expenditures (fiscal year ending September 30) of \$4.9 million. Funding from contracts and grants generated by the faculty accounted for approximately 58% of the total research expenditures in 2006. There were 27 new sponsored projects initiated in 2006.

Fifteen students completed graduate programs in the Department of Forestry during the academic year ending May, 2006; 3 M.F., 10 M.S., and 2 Ph.D. degrees were awarded. The faculty, staff, and graduate students published 58 technically reviewed journal articles in 2006. More than 70 additional papers, including proceedings, popular articles, etc., were published. Twenty-eight new students entered our graduate program during 2006.

Research programs in the department are carried out within five interest groups, each of which focuses upon an allied group of specialties. These groups are (1) Forest Biometrics, (2) Natural Resource Recreation, (3) Industrial Forestry Operations, (4) Forest Biology, and (5) Forest Economics, Policy, and Management. A summary of research activities during 2006 is contained on the following pages.

Forest Biometrics Research During 2006

Faculty

Harold E. Burkhart, John A. McGee, Richard G. Oderwald, Stephen P. Prisley, Philip J. Radtke, Marion R. Reynolds, Jr. (joint with Statistics), David Arthur Sampson, Randolph H. Wynne

Emeritus Faculty

Gregory J. Buhyoff

Senior Research Associate

Ralph L. Amateis

Postdoctoral Associates

Christine E. Blinn

Jason G. Henning

Growth and Yield Modeling

Loblolly Pine Growth and Yield Research Cooperative. H. E. Burkhart, R. L. Amateis. Industrial forestry members, Virginia Department of Forestry, USDA Forest Service (by cooperative agreement).

The cooperative's objective is to develop growth and yield models for intensively managed loblolly pine plantations. Current efforts include analysis of growth and mortality relationships for thinned and unthinned stands, incorporation of silvicultural treatment effects in growth and yield models, and impacts of competing vegetation on pine growth and mortality.

Modelling Production and Decay of Coarse Woody Debris in Loblolly Pine Plantations. S. P. Prisley, P. J. Radtke, C. A. Copenheaver, R. L. Amateis, H. E. Burkhart. USDA National Research Initiative.

The objective is to sample long-term research plots for dead wood and develop a modeling system to predict mass and volume of dead wood in thinned and unthinned plantations. This model will be valuable for predicting carbon storage in dead wood, as well as nutrients, forest fuel, and related values.

Modeling Forest Growth and Yield in a Changing Environment. P. J. Radtke. McIntire-Stennis.

The objective of this project is to adopt and adapt existing models to develop a system of forest growth and yield models capable of accounting for the effects of management activities and changing environmental conditions on the growth and yield of Virginia's forests.

Evaluating and Augmenting the FVS Southern Variant for Southeastern Mixed Forests. P. J. Radtke, T. R. Fox, C. A. Copenheaver, S. P. Prisley. USDA Forest Service.

This project aims to develop sensitivity analyses, uncertainty assessment, and calibration of the USDA Forest Service FVS-Sn variant for eight ecological sections in the Appalachian Mountains of the eastern United States. Assessments will account for the hierarchical structure of this individual-tree multi-species, age-independent growth and yield model.

Sampling and Forest Inventory

Assessment of the Small-Diameter Timber Resource in the Eastern United States. R. G. Oderwald. USDA Forest Service.

Much of the hardwood resource in the eastern United States is not large enough to justify sawlog production, yet use as pulp or similar products is not economically attractive to forest landowners. The objective of this project is to document the possible products, producers, and values for small-diameter material to assist forest landowners with forest management decisions.

Evaluating Population-Habitat Relationships of Forest Breeding Birds at a Landscape Scale Using Forest Inventory Data. S. P. Prisley, D. F. Stauffer (Fisheries and Wildlife Sciences). National Council of the Paper Industry for Air and Stream Improvement, Inc.

The objective is to analyze USFS Forest Inventory and Analysis (FIA) data in spatial conjunction with Breeding Bird Survey (BBS) data to determine if forest structure changes can explain variation in songbird population trends.

Improving Estimates of Land Use, Land-Use Change, and Forestry in the United States. S. P. Prisley. USDA Forest Service.

Transparent, verifiable estimates of forest carbon storage are needed for reporting greenhouse gas emissions at the national and state levels. This effort will develop methods to improve forest carbon estimates in the U.S.

**** Forest Inventory and Management Assistance, Redstone Army Arsenal, Alabama.***

J. L. Waldon (Conservation Management Institute), H. E. Burkhart. U.S. Army Engineering and Support Center.

Objective: To provide training for a variety of forest research and management tasks that will assist in sustaining the forest resources at Redstone Arsenal.

Remote Sensing, Photogrammetry, and Geographic Information Systems

Quantitative Tools for Spatial and Temporal Forest Management Planning. S. P. Prisley. McIntire-Stennis.

The objective of this project is to enhance the set of quantitative tools that can enable forest managers to analyze forest resource data.

Remote Sensing for Forest Productivity, Carbon Management, and Monitoring. R. H. Wynne, J. B. Campbell (Geography), C. E. Zipper (Department of Crop and Soil Environmental Sciences), L. T. Watson (Computer Science and Mathematics). National Aeronautics and Space Administration, George Mason University.

The overall aim of this project is to refine or develop the remote sensing applications needed to improve the statistical efficiency and spatial specificity of carbon monitoring and management in Virginia's timberland and urban forests. Building on a strong existing base, we are developing tools and data products that will use remote sensing capabilities developed by both NASA and the private sector for resource management and policy decision support in two related, high-priority NASA Earth Science Enterprise (ESE) applications: agricultural (forest) productivity and carbon management.

* New in 2006

StateView Program Development and Operations for the State of Virginia. J. B. Campbell (Geography), R. H. Wynne, J. A. McGee. U.S. Geological Survey.

VirginiaView is a consortium composed, at present, of nine Virginia institutions, including universities, state agencies, federal partners, non-profit organizations, and service organizations. In January 2004, VirginiaView was designated as an affiliate member of AmericaView. Member organizations encompass a broad range of activities, including university education, research, and extension, K-12 education, achieving of geospatial data, training and outreach, technology transfer, and other related activities.

Application of Spatial Uncertainty Models to Automate and Enhance Data Fusion. S. P. Prisley, L. W. Carstensen (Geography), K. Ye (Statistics), E. P. Smith (Statistics). National Geospatial-Intelligence Agency.

Geospatial analysis involves the combination of multiple sources of spatial data, each with differing source scale, timeliness, and reliability. This project will apply statistical models of spatial uncertainty to improve the process of spatial overlay by incorporating measures of uncertainty.

***Decision Support for Loblolly Pine Carbon Management: From Research to Operations.** R. H. Wynne, J. R. Seiler, T. R. Fox, S. P. Prisley, P. J. Radtke, R. L. Amateis, D. A. Sampson, and others outside Virginia Tech. National Aeronautics and Space Administration.

We are using a systems engineering approach to integrate earth science space-based observations and predictions resulting from NASA research into an existing forest management decision support tool, LobDST. Our objective is to enable landowners to make informed decisions about thinning and fertilizing with full understanding of the resulting implications for carbon sequestration (ecosystem net carbon balance less embodied carbon costs of silvicultural prescriptions) and productivity.

***Remote Sensing for Precision Silviculture.** R. H. Wynne, T. R. Fox, H. L. Allen (NCSU). Forest Nutrition Cooperative.

Multispectral and lidar data are being used to tailor silvicultural prescriptions in North and South American pine plantations.

***Silviscan – An Airborne Lidar-Forestry Conference.** R. H. Wynne. National Aeronautics and Space Administration.

The 4th International Conference on Forestry Lidar Applications was held in Blacksburg, and this grant supports the costs of publications arising from the conference.

***MODIS Monitoring of Lake Ice Breakup on Great Lakes Network Parks: A Feasibility Study.** R. H. Wynne. USDI National Park Service.

Visible and infrared bands from NASA's Moderate resolution Imaging Satellite are being analyzed for their utility in predicting ice breakup dates in Great Lakes Region National Parks.

***Net Ecosystem Exchange in Intensively Managed Pine Plantations.** R. H. Wynne. National Aeronautics and Space Administration.

Net ecosystem productivity is being modeled in pine plantations under a wide range of fertilization and thinning regimes using both in situ and remotely sensed data.

* New in 2006

Education

On-line Course Development to Enhance Community College Transfers into the College of Natural Resources. J. R. Seiler, P. J. Radtke, S. P. Prisley. Virginia Tech Office of the Provost.

This project aims to develop an introductory course on land and forest measurements for delivery by the worldwide web. The goal is to facilitate increased enrollment of community college students transferring to the Virginia Tech College of Natural Resources.

**** Mapping Water Quality: Bringing Science Back into the Classroom.*** J. McGee, J. L. Kirwan, P. E. Wiseman, M. M. Bryant (Landscape Architecture). National Oceanic & Atmospheric Administration.

This project aims to provide students with meaningful watershed experiences by linking local land-use planning issues with regional watershed-related impacts. Teachers are provided with the skills and resources so that they can assess historic changes in land use and forest cover in their local communities and sub-watersheds. Teachers are also provided with instruction and tools necessary to empower students to calculate the ecosystem values of trees as expressed in real-dollar savings to their communities.

**** Metadata Training and Outreach for Virginia: A Comprehensive Approach.*** J. McGee, R. H. Wynne. USGS/Federal Geographic Data Committee.

This project provides crucial support towards Virginia's metadata development and implementation efforts by providing "Metadata Creator Workshops" for local governments, planning district commissions (PDCs), state agency personnel, non-profit organizations, and the private sector. The project will extend training to other regions of the United States through the development of a comprehensive Metadata Training Toolkit.

Graduate Students Enrolled During 2006

Bernard, Aaron ¹	MS	BS, Virginia Tech
Brown, John	PhD	BS, Richard Stockton College of New Jersey MS, University of Maine-Orono
Dorr, Jessica	MS	BS, Virginia Tech
Folledo, Renato A.	PhD	BS, University of the Philippines Los Baños MS, University of the Philippines Los Baños
Herring, Nathan ²	MS	BS, Pennsylvania State University
Moan, Jason	MS	BS, University of Idaho
Otey, Jennifer	MF	BS, Virginia Tech
Packard, Kevin	PhD	BA, Carleton College MS, SUNY-CESF
Peduzzi, Alicia	PhD	BS, University of Los Andes, Venezuela MS, North Carolina State University

* New in 2006

¹ 2006 recipient of the A. B. Massey Award presented by the College of Natural Resources in recognition of outstanding academic and professional leadership

² 2005-07 recipient of a William J. Dann Fellowship awarded to an outstanding graduate degree candidate by the College of Natural Resources

Quirino, Valquiria F.	PhD	BS, Federal University of Parana, Brazil MS, Albert-Ludwigs University, Germany
Russell, Matthew	MS	BS, Paul Smith's College
Shrestha, Rupesh	PhD	BS, Tribhuvan University, Nepal MS, Stuttgart University of Applied Sciences, Germany
Trincado, Guillermo	PhD	BS, Universidad Austral de Chile MS, University Göttingen, Germany
VanderSchaaf, Curtis	PhD	BS, Stephen F. Austin State University MS, University of Idaho
Waiswa, Daniel	PhD	BS, Makerere University, Uganda MS, Makerere University, Uganda

Natural Resource Recreation Research During 2006

Faculty

R. Bruce Hull, Steven R. Lawson, Jeffrey L. Marion, Joseph W. Roggenbuck, Marc J. Stern

Supporting Faculty

Gregory S. Amacher, David P. Robertson, Jay Sullivan, Steve L. McMullin (Fisheries and Wildlife Sciences), James D. Fraser (Fisheries and Wildlife Sciences)

Research Associates

Karen S. Hockett
Aurora Moldovanyi

Recreation Site and Visitor Management

Trail and Campsite Impact Assessment and Evaluation of Strategies to Manage Backcountry Use at Shenandoah National Park. J. L. Marion. USDI National Park Service.

Objective: To identify and evaluate visitor impacts to campsites and trails and to evaluate the effectiveness of alternative impact management strategies.

Design and Testing of a Sampling Protocol for Monitoring Visitor Use and Resource Impact at Cape Cod National Park. J. L. Marion. USDI United States Geological Survey.

Objective: To identify and evaluate alternative protocols for monitoring both visitor use (type, amount, and distribution) and its more significant effects on park natural resources.

Research to Support Management of Social Carrying Capacity at Acadia National Park. S. R. Lawson. University of Vermont.

Objective: To assist in identifying visitor experience and resource condition indicators and standards of quality and to evaluate the acceptability of alternative visitor management practices at "icon" sites within the park.

Assessing the Amount, Type, and Environmental Effects of Climbing at Shenandoah National Park. J. L. Marion, S. R. Lawson. USDI National Park Service.

Objective: To help determine the amount and type of recreational use and associated resource impacts at cliff areas in the park.

Prince William Forest Park Neighborhood Residents and Visitor Survey. S. R. Lawson. USDI National Park Service.

Objective: To provide the National Park Service with information about neighborhood residents', visitors', and the general public's park visitation patterns, demographic characteristics, and attitudes and preferences for park management.

Examining the Utility of Computer Simulation for Monitoring Multiple Dimensions of Wilderness Solitude in Great Smoky Mountains National Park. S. R. Lawson. Virginia Tech Research Division, Virginia Tech College of Natural Resources, Virginia Tech Department of Forestry.

Objective: To use computer simulation modeling to develop precise estimates of visitor use and inter-group interactions among hiking, horseback riding, and backpacking visitors in the Cosby and Big Creek areas of Great Smoky Mountains National Park.

****An Assessment of Formal and Informal Trail Conditions at Acadia National Park.*** J. L. Marion. USDI National Park Service.

Objective: To develop and apply trail condition monitoring protocols to large samples of formal and informal trails within Acadia National Park, Maine.

****An Assessment of Formal and Informal Trail Conditions at C&O Canal National Historical Park and George Washington Parkway.*** J. L. Marion. USDI National Park Service.

Objective: To develop and apply trail condition monitoring protocols to all formal and informal trails within the two study parks.

****Recreation Use and Impacts to Cliff Resources, Great Falls and C&O Canal.*** S. R. Lawson, J. L. Marion, L. Resler (Geography). USDI National Park Service.

Objective: To help determine the amount and type of recreational use and associated resource impacts at cliff areas in the park.

****Evaluating the Efficacy of Educational and Site Management Options for Deterring Off-trail Visitor Traffic.*** J. L. Marion, S. R. Lawson. USDI National Park Service.

Objective: To develop, apply, and evaluate educational messaging and informal trail closure site management actions for their effectiveness in discouraging visitors from off-trail traffic.

****Visitor Experience and Resource Protection (VERP Study): Haleakala National Park.*** S. R. Lawson, J. L. Marion. USDI National Park Service.

Objectives: To assist in identifying visitor experience and resource condition indicators and standards of quality to inform planning and management of visitor use in the park; to study the efficacy of on-site signage and interpretation in promoting environmentally and socially sustainable visitor behavior.

Human Dimensions

The Nature, Meanings, and Benefits of Forest Camping in Postindustrial America. J. W. Roggenbuck. McIntire-Stennis.

Objective: To learn how the activity, experiences, and meanings of developed and primitive forest camping are changing across time and to correlate changes in camping style and benefits to personal, cultural, and environmental changes.

* New in 2006

Social Expectations and Acceptability of Post-fire Rehabilitation Work. R. B. Hull, D. P. Robertson, B. E. Goldstein (Urban Affairs and Planning). USDA Forest Service, North Central Experiment Station.

Objectives: Examine the roles of science, policy, and community involvement in management and community responses to fire, fire-dependent ecosystems, and post-fire restoration.

Management of Interface Forests: Professional Development Program. R. B. Hull, R. Visser. USDA Forest Service.

Objectives: Develop a training manual for resource professionals working in urbanized forested environments. The materials will focus on management issues such as small-scale harvesting, amenity, health, wildlife, and working with new owners of small forests.

****Fire Learning Networks: Evaluating Learning Networks as a Conservation Strategy for Working Across Property, Administrative, Institutional, and Disciplinary Boundaries.***

B. E. Goldstein (Urban Affairs and Planning), R. B. Hull. USDA Forest Service, The Nature Conservancy.

Objective: To evaluate the functions and efficacy of this multi-state, multi-party collaborative effort for fire management and restoration.

****Comparing NEPA Implementation Across Federal Land Management Agencies.*** M. J. Stern, M. J. Mortimer. USDA Forest Service.

Objective: To examine different mechanisms for complying with the national Environmental Policy Act and their relative efficiencies within four federal land management agencies.

Graduate Students Enrolled During 2006

Ashton, Sarah ¹	MS	BS, University of Maryland, College Park
Baral, Nabin	PhD	BS, Tribhuvan University, Nepal MS, Tribhuvan University, Nepal MS, Florida International University
Bullock, Steven	MS	BS, Utah State University
Hockett, Karen	PhD	BS, Ohio Northern University MS, University of Maine
Kiser, Brett ²	MS	BS, Virginia Tech
Park, Logan ³	PhD	BS, Furman University MS, University of Vermont
Wimpey, Jeremy	PhD	BS, James Madison University MS, James Madison University
Wood, Kerry	MS	BS, Southwest Texas State University

* New in 2006

¹ Also included with Industrial Forestry Operations graduate students

² 2006 recipient of the John F. Hosner Scholarship established by the Virginia Forestry Educational Foundation on behalf of interested industrial contributors

³ 2006-09 recipient of a Robert S. Burruss Fellowship awarded to an outstanding graduate degree candidate by the College of Natural Resources

Industrial Forestry Operations Research During 2006

Faculty

W. Michael Aust (joint with Forest Biology), Stephen P. Prisley (joint with Forest Biometrics), Robert M. Shaffer, J. M. (Rien) Visser

Research Associate/Instructor

W. A. Lakel

Emeritus Faculty

Thomas A. Walbridge, Jr.

Forest Operations

Assessing the Need for Spanish-Language Safety Training Materials for the Logging Industry in the Southeastern United States. R. M. Shaffer. USDA Forest Service.

Objective: To determine the current percentage of the logging workforce in the southeastern United States comprised of Spanish-speaking workers and develop a strategy to address the safety training needs for these workers.

****Identifying Barriers to Harvesting.*** R. Visser, R. Smith (Wood Science and Forest Products). Virginia Department of Forestry.

Objective: To assess what barriers exist to harvesting smaller tracts of timber from private forest owners. The goal is to develop a business model that will help facilitate successful harvesting operations, both for the forest owner as well as the harvesting contractors.

International

Improving Harvesting Operations in Bolivia. R. Visser. U.S. Agency for International Development.

Objective: To assess the current state of harvesting practices, develop research programs, and recommend improvements. Focus is not only on economic viability but also safety and environmental standards.

Graduate Students Enrolled During 2006

Ashton, Sarah ¹	MS	BS, University of Maryland, College Park
Bradburn, Benjamin	MF	BS, Virginia Tech
Currie, Joseph	MF	BS, University of the South
Hodges, Christine	MS	BS, Virginia Tech

* New in 2006

¹ Also included with Natural Resource Recreation students

Lakel, William	PhD	BS, Virginia Tech MS, Virginia Tech
Martin, Brandon	MS	BS, Virginia Tech
O'Neal, Brandon	MS	BS, University of Missouri-Columbia

Forest Biology Research During 2006

Faculty

W. Michael Aust (joint with Industrial Forestry Operations), Amy M. Brunner, James A. Burger, Carolyn A. Copenheaver, Susan D. Day, Ulrika Egertsdotter, Thomas R. Fox, J. Michael Kelly, Jeffrey L. Kirwan, James E. Johnson, John R. Seiler, Stephen H. Schoenholtz, P. Eric Wiseman, Shepard M. Zedaker

Emeritus Faculty

Robert E. Adams, David Wm. Smith

Cooperating Faculty

H. Lee Allen, North Carolina State University
John Fike, Department of Crop and Soil Environmental Sciences
Kurt D. Johnsen, USDA Forest Service
Robert H. Jones, Department of Biology
David L. Loftis, USDA Forest Service
Scott M. Salom, Department of Entomology
James M. Vose, USDA Forest Service
Carl E. Zipper, Department of Crop and Soil Environmental Sciences

Postdoctoral Associates

Mark H. Eisenbies
Takeshi Fujino
P. David Jones
Chieh-Ting Wang

Research Associates

Colleen A. Carlson
Elizabeth R. Etherington
Kyle R. Peer
Xiaoyan Sheng

Christmas Trees

Comparison of Cultural Treatments and Tree Species for Christmas Tree Production on Reclaimed Mineland in Virginia. J. A. Burger. Powell River Project.

Objectives: (1) Determine the feasibility of growing seven Christmas tree species on reclaimed mined land using several cultural treatments; (2) provide demonstration areas and activities for the general public.

Ecology

Modelling Production and Decay of Coarse Woody Debris in Loblolly Pine Plantations. S. P. Prisley, P. J. Radtke, C. A. Copenheaver, R. L. Amateis, H. E. Burkhart. USDA National Research Initiative.

The objective is to sample long-term research plots for dead wood and develop a modeling system to predict mass and volume of dead wood in thinned and unthinned plantations. This model will be valuable for predicting carbon storage in dead wood, as well as nutrients, forest fuel, and related values.

Monitoring the Effectiveness of a Wetland Mitigation Project in the Virginia Piedmont. C. A. Copenheaver, W. M. Aust. Boxley Materials Company.

Objectives: To gain a better understanding of how to create successful wetland mitigation areas by (1) monitoring survivorship and growth of planted trees within an actual wetland mitigation site and (2) monitoring competing vegetation at these sites.

Regeneration/Silviculture

Reforestation and Forest Land Uses of Reclaimed Mined Lands. J. A. Burger. Powell River Project.

Objectives: (1) Develop productive mine soils for reforestation; (2) evaluate cultural treatments including the use of mycorrhizal seedlings, fertilization, weed control, nurse trees, and organic mulches; (3) develop recommendations for timely, successful restoration of forests on drastically disturbed land.

Response of Loblolly Pine and Woody Plant Diversity to Competition Control. S. M. Zedaker. Virginia Tech Foundation, Dow Chemical, Monsanto Chemical, Acorn Alcinda Foundation (The Kennedy Family).

Objectives: (1) Develop objective measures of competition in pine plantations based on size, proximity, numbers, species, and control of site resources by competing species; (2) quantify the competitive status created by site preparation and various levels of release for loblolly pine plantations; (3) predict early growth response to release of planted pines; (4) evaluate several new herbicides for control of competition using technologies applicable to small woodland owners.

Early Stand Development and Competition in Piedmont Mixed Forests. S. M. Zedaker, D. Wm. Smith, J. E. Johnson. McIntire-Stennis, Acorn Alcinda Foundation (The Kennedy Family).

Objectives: (1) Determine the growth, yield, and stand development of the hardwood, hardwood-pine, and pine stands created by density-induced mortality (stand closure); (2) determine the relative yields and competitiveness of loblolly pine, red maple, and black locust when grown with and without the influence of herbaceous vegetation; (3) determine the patterns of biomass allocation and resource partitioning in simplified systems of pine growing with a non-nitrogen-fixing hardwood and a nitrogen-fixing hardwood, with and without the influence of herbaceous vegetation.

Contrasting Productivity of Four Genetic Lines of Loblolly Pine and Single Sources of Shortleaf Pine, Virginia Pine, and White Pine as well as Native Regeneration after Clearcutting on the Virginia Piedmont. T. R. Fox, J. R. Seiler, S. M. Zedaker. Reynolds Homestead Endowment.

Objective: To determine differences in productivity among and between pine species in planted and native stands using various vegetation management alternatives.

Evaluating the Effects of Annual Fertilization and Weed Control on the Growth and Productivity of Four Genetic Lines of Loblolly Pine and Single Sources of Shortleaf Pine, Virginia Pine, and White Pine in the Virginia Piedmont. T. R. Fox, J. R. Seiler, S. M. Zedaker. Reynolds Homestead Endowment.

Objectives: (1) Determine the impacts of intensive plantation management on growth of various pine sources in the Virginia Piedmont; (2) evaluate physiologic response of different species to changes in resource availability and correlate those changes with growth response.

Sustainable Engineered Materials from Renewable Resources. S. M. Zedaker, P. J. Radtke, S. P. Prisley, T. R. Fox. CSREES/USDA Special Research Grants.

Objectives: (1) Evaluate and interpret the effects of alternative silvicultural systems and site characteristics for the sustainable production of composite wood; (2) develop a systematic approach to wood materials selection and composite wood structure design and manufacture; (3) develop technology to improve the durability of wood-based composites.

Crop-Tree Release in Pitch x Loblolly Pine. T. R. Fox. Reynolds Homestead Endowment.

Objectives: Evaluate the effect of crop tree release on the growth and quality of pitch x loblolly pine hybrids in the Piedmont of Virginia.

Restoring Sustainable Forests on Appalachian Mined Lands for Wood Products, Renewable Energy, Carbon Sequestration, and Other Ecosystem Services. J. A. Burger, T. R. Fox, G. S. Amacher, C. E. Zipper (Crop and Soil Environmental Sciences), J. M. Galbraith (Crop and Soil Environmental Sciences), J. Sullivan. U.S. Department of Energy.

Objectives: (1) Determine cause-and-effect relationships between rate of forest growth and mine soil properties; (2) develop a site classification and mapping system for mined sites that will be returned to forests; (3) develop silvicultural procedures for preparing mined sites and establishing and managing native hardwoods; (4) complete a benefit-cost analysis of reforestation alternatives for mined land; (5) complete a regional assessment of carbon sequestration potential of reforested mined land.

Forest Nutrition Cooperative. T. R. Fox. Industrial affiliates.

Objective: Develop and provide to members innovative solutions to enhance and sustain forest productivity through management of nutrients.

Restoration Silviculture – Developing Silvicultural Practices to Improve the Productivity and Health of Forest Ecosystems in the South. T. R. Fox. McIntire-Stennis.

Objective: Develop silvicultural practices that increase growth and improve the sustainability of managed forests in the South.

Clonal Forestry for Southern Pines. T. R. Fox, J. R. Seiler. Reynolds Homestead Forest Resources Research Center.

Objective: To evaluate the growth and physiology of clonal loblolly pine in Virginia.

Effects of Prescribed Burning, Mechanical, and Chemical Treatments to Curtail Rhododendron Dominance and Reduce Urban Interface Fuel Loads. S. M. Zedaker. Joint Fire Science Program, George Washington & Jefferson National Forests. USDA Forest Service.

Objectives: (1) Measure the response of rhododendron-dominated sites to prescribed burns, cutting, herbicide application, and their combinations for fuel loading, rhododendron survival, and immediate treatment installation costs; (2) document short-term (three-year) and predict long-term efficacy of fuel treatments and costs over time for different treatments by measuring rhododendron recovery and fuel build-up; (3) predict differences in fire behavior and annual cost of fuel management as a result of differences in fuel treatment.

What Mechanisms Control Understory Biodiversity, Resilience, and Nutrient Processes in Managed Appalachian Forest Ecosystems. C. A. Haas (Fisheries and Wildlife Sciences), T. R. Fox, R. H. Jones (Horticulture). USDA National Research Initiative.

Objectives: Evaluate the impact of alternative harvesting systems on ecosystem processes, wildlife population, and stand structure of Appalachian hardwood forests.

Tree Growth Response, Nutrient Dynamics, and Water Quality Following Land Applications of Biosolids to Forests in Virginia. T. R. Fox, W. L. Daniels (Crop and Soil Environmental Sciences), G. K. Evanylo (Crop and Soil Environmental Sciences), W. M. Aust, J. A. Burger. Metropolitan Washington Council of Governments.

Objectives: Evaluate the impacts of biosolid application on nutrient dynamics and tree growth in loblolly pine plantations in the Virginia Piedmont.

***Using a Mechanistic Nutrient Uptake Model to Evaluate Plant Available Boron in Spodic Soils.** J. M. Kelly, T. R. Fox. Forest Nutrition Cooperative.

Objective: Evaluate the role of soil supply parameters on the availability of boron to the roots of loblolly pine trees growing in flatwood Spodosols through the use of a suite of mechanistic nutrient uptake models.

Soils

Sustaining the Productivity and Function of Intensively Managed Forests. J. A. Burger, W. M. Aust, M. H. Eisenbies. MeadWestvaco.

Objectives: Quantify the effects of severe soil disturbance on hydrology, soils, and site productivity of intensively managed forested wetlands and evaluate the relative efficacy of amelioration treatments.

Long-Term Impact of Phosphorus Fertilization on Forms and Availability of Phosphorus in Loblolly Pine Plantations on Contrasting Soils. T. R. Fox. USDA National Research Initiative.

Objectives: Determine changes in soil phosphorus availability in loblolly pine at rotation age following phosphorus fertilization at plantation establishment.

* New in 2006

Demonstrate the Potential for Large-Scale Carbon Sequestration by Reforestation of Mined Lands Using Managed Forests. J. A. Burger, C. E. Zipper (Crop and Soil Environmental Sciences). Virginia Division of Mines, Minerals and Energy.

Objectives: (1) Estimate forest productivity and carbon sequestration potential on reclaimed mined land; (2) develop husbandry practices for enhancing the potential of mined land to sequester carbon.

Forest Productivity as a Function of Root Growth Opportunity in Compacted Forest Soils. J. A. Burger. USDA Forest Service.

Objectives: (1) To determine the physical response of different soil types to compactive forces to better understand the management implications of soil disturbance on forest landscapes; (2) to validate root growth models *in situ* for different soil types using continuous climate data.

Carbon Sequestration Project on Surface Mined Sites in the Clinch and Powell River Valleys of Virginia. J. A. Burger, C. E. Zipper (Crop and Soil Environmental Sciences). The Nature Conservancy.

Objectives: (1) To develop analytical techniques for measuring pedogenic soil organic carbon in mine soils; (2) to design and implement a detailed carbon sequestration monitoring plan and protocol for mined land; (3) to develop and implement a detailed reforestation plan for a reclaimed surface mine.

Linking Intensively Sampled Soil and Foliar Chemistry Data with Forest Health Monitoring Protocols to Better Evaluate the Effects of Acidic Deposition on Forest Health. J. A. Burger. USDA Forest Service.

Objectives: (1) Evaluate the current FHM protocol to determine its suitability for monitoring changes in forest health due to acid deposition; (2) test the utility of foliar chemistry as an indicator of forest health.

Developing an Improved Forest Land Classification System for the Appalachians Based on Climate, Topography, Landform, and Geology. T. R. Fox, P. J. Radtke, C. A. Copenheaver, S. P. Priskey. USDA Forest Service.

Objectives: The goal of this project is to develop an improved system for determining forest site quality in the southern and central Appalachians. Many of the existing forests in the Appalachians have been repeatedly high-graded, and it is difficult to accurately determine site quality using conventional measures such as site index. This work is developing and testing a GIS-based method to evaluate forest site quality using data such as climate, landform, topography, geology, and soils that is applicable throughout the region.

****Thirty-year Changes in Soil Carbon in Six Soil Series on the Camp Branch Watershed.*** J. M. Kelly. National Council for Air and Stream Improvement of the Pulp and Paper Industry.

Objective: Determine if after a 30-year interval changes in total soil carbon in the individual soil series occurring in a second-growth oak forest on the Cumberland Plateau can be detected and related to standing pools of organic and inorganic nitrogen.

* New in 2006

Water Quality

Effects of Forested Riparian Buffer Width and Timber Harvest Intensity on Headwater Appalachian Watersheds. W. M. Aust, C. A. Dolloff (USDA Forest Service). National Council of the Paper Industry for Air and Stream Improvement, Inc.; MeadWestvaco; USDA Forest Service.

Objective: To evaluate the effects of Stream Management Zone (SMZ) width and harvest level on water quality.

Streamside Management Zone Width and Harvest Level Effects on Stream Water Quality and Benthic Organisms within Loblolly Pine Plantations. W. M. Aust, C. A. Dolloff (USDA Forest Service). USDA Forest Service.

Objectives: To quantify the effects of SMZ harvest level and width on stream water quality and benthic organisms in Piedmont watersheds managed for loblolly pine plantations.

Establishing and Managing Streamside Management Zones as Best Management Practices for Protection of Water Quality and Site Productivity. W. M. Aust, J. R. Seiler. McIntire-Stennis.

Objectives: (1) Evaluate the effects of forest land use/disturbance on watershed water yield, surface erosion, and stream water quality by examining existing literature and hydrologic data sets; (2) quantify the long-term effects of timber harvesting (aerial and ground-based systems) on the biomass, sediment accumulation, and stand composition in a 20-year-old riparian area associated with a major river system characterized by annual flooding; (3) quantify the effects of SMZ width and harvest level on stream water quality; (4) demonstrate and contrast the benefits and costs of establishing riparian forests versus grass filter strips on agricultural lands used for row crops; (5) quantify the hydrologic pathways and nutrient inputs from pastureland to and from recently established riparian forests; (6) quantify how riparian forest functions will change over time by continuing to monitor disturbed and non-disturbed forested wetlands (2004 is year 18 for the oldest study); (7) quantify the effects of forest roads and trails on soil erosion and sediment inputs to riparian forests; (8) quantify how riparian forests store, transform, and export carbon, both above and below ground.

Development of a Riparian Enhancement Plan for Black Creek, Wise County, Virginia. C. A. Copenheaver, W. M. Aust. Virginia Department of Mines, Minerals, and Energy.

Objective: To develop a riparian enhancement plan for a surface-mined watershed.

Forest Watershed Land Use and Flooding. W. M. Aust, J. A. Burger, M. H. Eisenbies. USDA Forest Service.

Objective: To evaluate existing hydrologic models that may be appropriate for modeling land use effects on flooding.

Differential Rates of Nitrate Retention in Two Watersheds in the Fernow Experimental Forest: Norway Spruce versus Native Hardwood Forests. S. H. Schoenholtz. USDA Forest Service. (VWRRRC project)

The goal of this study is to investigate the role of vegetation and subsequent soil characteristics on production and cycling of different pools of N in forested ecosystems of the central Appalachians in order to explain differences in levels of dissolved nitrogen exported in streamwater.

An Analysis of Solute Transport on a Logged Hillslope in the Southern Appalachian Mountains. S. H. Schoenholtz. USDA Forest Service. (VWRRC project)

Objectives: (1) Determine the relationship of nitrogen mineralization potential and leaching potential to patterns of dissolved nitrogen in soil solution, groundwater, and streamwater; (2) analyze the role of saprolite in storage of dissolved nitrogen and carbon; (3) quantify patterns of dissolved nitrogen and carbon within the soil solution from harvested upslope areas through riparian buffer zones; (4) explore the role of riparian buffer zones in changing concentrations of dissolved nitrogen and carbon reaching streamwater.

Agroforestry

Optimizing Management of Agroforestry Systems for Appalachian Hill Pastures. J. A. Burger. USDA Agricultural Research Service.

Objective: Explore the potential for Appalachian agroforestry and demonstrate systems and principles of agroforestry.

Urban Forestry

Development of a Green Infrastructure Technology that Links Trees and Engineered Soils to Minimize Runoff from Pavement. S. D. Day, J. R. Harris (Horticulture), J. E. Dove (Civil and Environmental Engineering), N. L. Bassuk (Cornell University), P. Trowbridge (Cornell University), Q. Xiao (University of California, Davis). USDA Forest Service—National Urban & Community Forestry Advisory Council.

Objectives: (1) Develop a system using trees and structural soil—a new technology that permits root growth under pavement—in an innovative application that will minimize runoff; (2) evaluate the impact of the system on runoff reduction, water quality, and the contribution of trees to water removal from the system; (3) build demonstration sites with public/private partnerships.

The Role of Adventitious Roots in Deeply Planted Trees. S. D. Day, J. R. Harris (Horticulture). Mid-Atlantic Chapter – International Society of Arboriculture Frank J. Santamour Grant Program.

Objectives: Evaluate the occurrence of and contribution to tree vigor of replacement root systems that result from planting the root collar below soil grade.

Planting Deep: Evaluating Long-term Effects on Trees and Methods of Diagnosis and Treatment. S. D. Day, J. R. Harris (Horticulture). Tree Research & Education Endowment (TREE) Fund.

Objectives: To evaluate the effects of deep planting on food-sensitive tree species.

A Web-based Geographic Information System (GIS) for Virginia Tech Campus Trees. P. E. Wiseman. Virginia Tech Center for Excellence in Undergraduate Teaching.

Objective: To develop a web-based geographic information system (GIS) of Virginia Tech's campus trees.

Long-term Effects of Soil Contact with the Trunks of White Oak and Sweetgum. S. D. Day. Morton Arboretum.

Objectives: Continuation of a long-term study evaluating the effects of changes in soil grade (such as occur during construction) on the health of forest trees.

***Rehabilitation of Urban Soils: A Critical First Step for Long-term Soil Productivity and Canopy Cover in Urban Forests.** S. D. Day, J. R. Harris (Horticulture). Tree Research & Education Endowment (TREE) Fund.

Objectives: (1) Evaluate several soil rehabilitation protocols for soils that have been highly disturbed by construction or development; (2) determine their effects on soil physical properties and tree establishment and growth.

***Using Parameters of Urban Root Confinement and Soils to Predict Tree Growth and Canopy Coverage.** S. D. Day, J. R. Harris (Horticulture), F. R. Arguedas (University of Costa Rica).

Objective: Predict urban tree development for a given species from soil volume, surface area, organic matter content, texture, and bulk density.

***Earthworm Ecology and Applied Technology in Landscape Tree Soils.** P. E. Wiseman. Tree Research & Education Endowment (TREE) Fund.

Objectives: To characterize earthworm abundance in urban soils and investigate novel methods of earthworm population augmentation to benefit landscape trees.

***Destabilization Force of Newly Transplanted Trees and the Efficacy of Tree Stabilization Systems.** P. E. Wiseman. Mid-Atlantic Chapter-International Society of Arboriculture.

Objective: To evaluate the impact of stabilization systems on the stability and growth of recently transplanted landscape trees.

***Demonstration and Research of Overhead Utility-Compatible Trees.** P. E. Wiseman. Virginia Department of Forestry.

Objectives: To increase public awareness about overhead utility compatible trees, to evaluate the growth and development of landscape tree cultivars that may be suitable for planting in overhead utility rights-of-way, and to disseminate this information to professionals and the general public.

Genetics

Long-Term Growth and Performance of F₂ Pitch x Loblolly Pine Hybrid Families in the Virginia Piedmont. T. R. Fox. Reynolds Homestead Endowment.

Objectives: (1) Compare the long-term growth of loblolly pine, pitch pine, and hybrids of pitch x loblolly pine in the Virginia Piedmont; (2) evaluate the performance of individual F₂ families of pitch x loblolly pine.

Methods for Production of Christmas Trees. U. Egertsdotter with international colleagues. The Research Council of Norway.

Objective: To develop scale up methods for production of Christmas trees from superior varieties of Sub alpine fir and Fraser fir.

* New in 2006

Functional Genomics of Flowering in the Woody Perennial Populus. A. M. Brunner with colleagues at Mississippi State University, Pennsylvania State University, and University of Alabama. National Science Foundation Plant Genome Program.

Objectives: (1) Identify the genes and genetic pathways controlling the initiation of flowering in *Populus*; (2) discover the important differences and similarities in the regulation of flowering between a tree and an annual herbaceous plant.

New Genetic Tools for Modifying Tree Properties to Enhance Carbon Sequestration. Microarray Expression Analysis of Poplar Regulatory Gene Families. A. M. Brunner with colleagues at Oregon State University, North Carolina State University, and University of West Virginia. DOE/Terrestrial Carbon Sequestration.

Objectives: (1) Identify poplar regulatory genes that act as major genetic control points for tree growth, development, and response to environmental stimuli; (2) demonstrate how this information can be used to produce trees with modified qualities important to carbon sequestration, such as modified root and shoot architecture, root-shoot biomass ratio, and cell wall chemistry.

International Forestry

Sustainable Forestry in Bolivia. J. E. Johnson, A. L. Hammett (Wood Science and Forest Products), R. Visser, R. Smith (Wood Science and Forest Products). The Nature Conservancy – Bolivia.

Objectives: To provide research and educational support to the BOLFOR II project and the Bolivian Forest Research Institute in the following areas: (1) community forestry; (2) GIS and forest management; (3) reduced impact logging; (4) wood technology; (5) forest products marketing; and (6) institutional capacity building.

Soil and Site Quality Indicators for Measuring Change in Forest Productivity Across Site Types in New Zealand. S. H. Schoenholtz (University of Oregon), J. A. Burger. Forest Research Institute, New Zealand.

Objectives: (1) To determine organic matter decomposition and nitrogen mineralization dynamics as a function of soil disturbance, species, and site type; (2) to model soil and site quality changes due to intensive forest management.

Educational

Development of Innovative Learning Techniques in Woody Plant Identification and Forest Biology. J. R. Seiler. Virginia Forestry Educational Foundation, Virginia Tech Enterprise Development Fund.

Objective: Develop multimedia, on-line educational programs to enhance learning of plant identification, forest biology, and forestry.

Sustainable Forestry Education. J. E. Johnson, J. L. Gagnon. Virginia Forestry Association.

Objective: Develop and deliver a series of forest landowner educational programs.

Forest Stewardship Education Program. J. E. Johnson, J. L. Gagnon. Virginia Department of Forestry.

Objective: Develop and deliver educational programs in support of the Virginia Forest Stewardship Program.

Forestry Outreach Site (FORSite). J. R. Seiler, J. L. Kirwan. Virginia Forestry Educational Foundation.

Objective: Develop a web-based and service learning forestry educational site for Virginia middle school students and teachers.

Program Enhancements to Accelerate the Growth of Virginia Tech's Urban Forestry Option. S. D. Day, P. E. Wiseman, J. L. Kirwan. Virginia Department of Forestry.

Objective: Accelerate the growth and impact of the urban forestry undergraduate and graduate programs at Virginia Tech.

Big Trees = Big Values. J. L. Kirwan, J. R. Seiler, P. J. Radtke. National Urban and Community Forestry Foundation, American Forests.

Evaluation of the methods used in measuring and listing national champion trees and communicating the value of big trees on the web.

***Mapping Water Quality: Bringing Science Back into the Classroom.** J. McGee, J. L. Kirwan, P. E. Wiseman, M. M. Bryant (Landscape Architecture). National Oceanic & Atmospheric Administration.

This project aims to provide students with meaningful watershed experiences by linking local land-use planning issues with regional watershed-related impacts. Teachers are provided with the skills and resources so that they can assess historic changes in land use and forest cover in their local communities and sub-watersheds. Teachers are also provided with instruction and tools necessary to empower students to calculate the ecosystem values of trees as expressed in real-dollar savings to their communities.

Graduate Students Enrolled During 2006

Aksamit, Dawn	MS	BS, Virginia Tech
Alvey, Alexis	MS	BS, Cornell University
Amichev, Beyhan	PhD	BS, Virginia Tech MS, Virginia Tech
Arellano, Eduardo	PhD	BS, Pontificia Universidad Catolica de Chile MS, Oregon State University
Atwood, Chad	MS	BS, Pennsylvania State University
Carroll, Matthew	MS	BS, Virginia Tech
Cotton, Claudia	PhD	BS, University of Kentucky-Lexington MS, University of Kentucky-Lexington
DeBruyne, Scott	MS	BS, Virginia Tech
Elias, Patrica	MS	BS, University of Notre Dame
Elliot, Rob	MS	BS, University of North Carolina, Chapel Hill

* New in 2006

Feldt, Robert	MF	BS, Virginia Tech
Flatley, William	MS	BA, Dartmouth College
Gellerstedt, Laura	MS	BS, Virginia Tech
Harrell, Charles	MS	BS, Clemson University
Hurst, Emily	PhD	BS, University of Virginia
Issem, Cristina	PhD	BS, California Polytechnic and State University-San Luis Obispo MS, Virginia Tech
Jones, Christopher	MS	BS, Christopher Newport University
Kelly, Charlene	PhD	BS, University of Dayton MS, West Virginia University
Kiser, Christopher	MS	BS, Ferrum College
Kovach, Katherine	MS	BS, North Carolina State University
Lara-Chavez, Alejandra	PhD	BS, Zamorano Agricultural University, Honduras MS, Bioplantitas Center, Honduras
Lin, Wen	PhD	BS, Sichuan University, P.R. China MS, Sichuan University, P. R. China
Miller, Bradley	PhD	BS, Mount Olive College MS, Appalachian State University
Moore, Erin	MS	BS, University of Georgia
Pavlis, Michael	MS	BS, West Virginia University
Pratt, Aaron	MS	BA, Brown University
Rasamoelina, Mami	PhD	MS, University of Antananarivo, Madagascar Diploma of Agricultural Engineer, University of Antananarivo, Madagascar
Ratnaparkhe, Supriya	PhD	BS, Gujarat University, India MS, Gujarat University, India MPhil, Gujarat University, India
Salzburg, Adam	MF	BS, University of Vermont
Slaughter, Ryan	MS	BS, University of Montana
Steele, Jason	MS	BS, West Virginia University
Sucre, Eric	PhD	BS, North Carolina State University MS, University of Washington
Sypert, Robert	MS	BS, University of Arkansas-Monticello
Templeton, Benjamin	MS	BS, Virginia Tech

Tyree, Michael	PhD	BS, Pennsylvania State University MS, Virginia Tech
Wadl, Erica Fritz	MS	BS, Virginia Tech

Forest Economics, Policy, and Management Research During 2006

Faculty

Gregory S. Amacher, Michael J. Mortimer, Jay Sullivan

Emeritus Faculty

Otis F. Hall, Harry L. Haney, Jr., W. David Klemperer, Harold W. Wisdom

International Forestry

An Assessment of Smallholder Forest Families in Brazil. G. S. Amacher, F. D. Merry. IPAM (Instituto de Pesquisa Ambiental da Amazônia), Woods Hole Research Center.

This project examines the effects of logging contracts and smallholders in migrant communities within the Brazilian Amazon. Both welfare effects and decisions such as land clearing and labor use are being evaluated based on surveys of thousands of smallholders in Para and the Transamazon.

Feedbacks Among Forestry, Agriculture, and Fire in Amazonia. D. Nepstad (Woods Hole Research Center), G. S. Amacher, L. Curran (Yale University), R. Kaufmann (Boston University), F. D. Merry. National Science Foundation.

This project is a multi-institutional, multiyear research project that includes ecologists, economists, political scientists, and land use specialists from Virginia Tech, Woods Hole Research Center, Boston University, Yale University, IPAM (Brazil), and the Universidade Federal de Minas Gerais. The work focuses on development of models explaining deforestation, particularly through understanding the behavior of subsistence smallholders and patterning of forest industry expansion on new and future Amazon forest frontiers. We are ultimately interested in how these respond to various policy scenarios, market shifts, and government programs. The logging and smallholder models being developed at Virginia Tech will eventually be integrated into a spatially-explicit model of development and logging expansion to predict patterns of deforestation over time.

****The Role of Natural Resources in Mitigating Political, Environmental, and Health Shocks to Extremely Poor Households in Southeastern Africa.*** F. D. Merry, G. S. Amacher, N. Laporte (Woods Hole Research Center), P. Epstein (Harvard University). National Science Foundation.

The objective of this grant is to study the role of natural resources in mitigating political, environmental, and health shocks among extremely poor households in Mozambique and Uganda. The work is a collaboration between Virginia Tech, Woods Hole Research Center, Harvard University, Harvard Medical School, and Dartmouth University. One special focus is the revitalization of the Gorongosa National Park and its importance in alleviating shocks to subsistence households in both embedded and nearby village economies. Shocks due to war, famine, health, and resource condition changes will be examined. Several Ph.D. students will be involved in a multi-disciplinary setting that encompasses health professionals, geo-spatial experts, economists, historians, and ecologists.

* New in 2006

Forest Taxation and Regulation

Assessing the Impact of Administrative Structure and Processes on the Enforcement of Forest Practices Controls in the Southern United States. M. J. Mortimer. McIntire-Stennis.

This project will assess the effectiveness of forest practices controls from an administrative perspective, with emphasis on how well various laws and regulations work “on the ground.”

Forest Landowners

Restoring Sustainable Forests on Appalachian Mined Lands for Wood Products, Renewable Energy, Carbon Sequestration, and Other Ecosystem Services. J. A. Burger, T. R. Fox, G. S. Amacher, J. Sullivan, C. E. Zipper (Crop and Soil Environmental Sciences), J. M. Galbraith (Crop and Soil Environmental Sciences). U.S. Department of Energy.

This project will examine the financial feasibility of converting previously reclaimed mined lands into productive forests. Through survey methodology, an assessment will be made of the incentives required by landowners to convert lands formerly reclaimed to grass species to a forested condition, and the viability of policy instruments that could be used to encourage this conversion will be examined. Ultimately the projected costs of sequestering carbon through this means will be investigated.

Bioenergy: Optimum Incentives and Sustainability of Non-Industrial Private Forests in the U.S. South. J. Alavalapati (University of Florida), G. S. Amacher, S. Mehmood (University of Arkansas-Monticello), J. Sullivan, W. Smith (University of Florida). U.S. Department of Agriculture, U.S. Department of Energy.

This is a multiyear collaboration between Virginia Tech, University of Florida, and University of Arkansas, funded under the U.S. Department of Energy and U.S. Department of Agriculture Bio-energy Initiative. The purpose is to study incentives of biotechnology adoption on non-industrial forest land. The project involves understanding the incentives for landowners to adopt various forms of management to produce bio-energy alternatives and integrating this into a land-use model to evaluate the design and targeting of policy instruments to achieve various biotechnology production goals. The importance of risk in emerging markets and risks to biotechnological improvements will also be studied. Another important facet of the research is integrating the microeconomic aspects of landowner behavior with changes in regional economic indicators to estimate welfare changes from bio-energy adoption and application of policy instruments.

Forest and Natural Resource Policy

Decision Models for Wildfire Protection. G. S. Amacher, A. S. Malik (George Washington University). USDA Forest Service North Central Research Station.

This project will build upon the value of information project by examining a policy problem where the government can either disseminate information to landowners or engage in traditional subsidies to encourage landowners to undertake fuel reduction. Adjacent landowner effects will be modeled as an underlying consequence of any policy. Both first-best and second-best models will be evaluated.

****Use of the Equal Access to Justice Act in Federal Land Management.*** M. J. Mortimer.

We are investigating how often litigants request legal cost reimbursement from federal agencies following litigation against those agencies.

* New in 2006

*** Forest Policy in Practice: Lessons Learned in Ecosystem Management and Forest Health.**
M. J. Mortimer.

The objective is to examine ecosystem management implementation on two national forests and competing models for forest health in the northern Rocky Mountains.

Fire Economics and Policy

Dynamic Models of Fire Policy Design and Fuel Reduction with Multiple Landowners. G. S. Amacher, A. S. Malik (George Washington University). USDA Forest Service.

This project will develop a dynamic game theory model revealing incentives for adjacent landowners to practice fuel reduction. Various policy instruments will be evaluated in terms of social cost reduction and effect on fuel reduction. The interaction of adjacent landowners and the information they have will be important in developing the strategic nature of their decisions.

A Framework to Assess the Marginal Value of Remote Sensing for Wildfire Management.
H. Hesseln (University of Saskatchewan), G. S. Amacher. National Center for Fire Landscape Analysis at University of Montana.

The objective of this project is to conduct a benefit cost analysis of various geospatial technologies employed in fire suppression management at the operational strategic planning level. The work will focus mainly on fire suppression in the northern Rocky Mountains.

Graduate Students Enrolled During 2006

Baker, Katherine	MS	BS, Virginia Tech
Bowman, Maria	MS	BS, Juniata College
Freeman, James	PhD	BA, Virginia Tech MPA, Virginia Tech
Lang, Eric	PhD	BA, Virginia Tech
Lima, Eirivelthon	PhD	BS, Rural University of the Brazilian Amazon, Brazil MF, Yale University
Predmore, Andrew	PhD	BA, University of Virginia MS, Auburn University
Stull, Lauren	MS	BS, Virginia Tech
Weng, Fanfan	PhD	BA, Beijing Forestry University, P. R. China

* New in 2006

OUTREACH AND EXTENSION

The outreach and extension programs in the Department of Forestry seek to strengthen and enhance the management of forest resources through educational programming and information transfer to all publics of our society. Programming is diversified to serve many audiences having varied objectives and interests.

Outreach programs are conducted in a variety of fields and using a host of methods. In the College of Natural Resources, outreach programs are organized into the following five categories:

- Cooperative and industrial extension programs
- Continuing education programs
- Youth and teacher education programs
- Economic development programs
- International development programs

In the Department of Forestry, faculty, staff, and students are actively involved in programs within all of these categories. Cooperative and industrial extension programs are offered to a variety of audiences, such as forest landowners and loggers. Primary subject areas include forest management and economics, silvicultural applications, and timber harvesting. Educational programs are offered throughout the state in cooperation with the Virginia Department of Forestry, the Virginia Forestry Association, the State Implementation Committee of the Sustainable Forestry Initiative, and many other groups. One or more of the department's extension specialists and associates generally coordinates extension programs.

Continuing education (CE) programs are offered to professional audiences such as foresters, wildlife managers, certified public accountants, etc. These fee-based programs are conducted in cooperation with Virginia Tech's Office of Outreach Program Development and include several different types, such as open enrollment programs, contract programs, conference services, and research dissemination programs. The Department of Forestry has an active CE program, involving both extension and non-extension faculty as coordinators and instructors. Programs are regularly offered in the areas of forest management and economics, silviculture, forest biometrics, timber harvesting, and forest taxation and regulation.

The Department of Forestry is actively involved in educational programs to benefit youth and the teachers and adult leaders who work with school-aged children. Department faculty, staff, and students are actively involved through 4-H summer camp programs, 4-H in-school projects and judging programs, and middle school teacher and student projects.

In addition to educational programs and projects, faculty in the department are actively engaged in publishing educational bulletins, developing educational curriculum materials, producing newsletters and magazine columns, preparing videotapes, and developing and maintaining educational web sites.

The Department of Forestry is committed to supporting economic development activities throughout the commonwealth. Faculty and staff regularly consult and provide technical assistance to companies and other state agencies in support of broad-based economic development efforts. In addition, many of the continuing education and cooperative extension programs support the economic development mission.

International programs are an important component of the Department of Forestry's outreach portfolio. Active involvement in international projects broadens the knowledge base of faculty, staff, and students and helps to connect the department with the rest of the world. Raw wood resources and finished wood products are bought and sold internationally every day, and the Department of Forestry recognizes that "going global" is an important part of all of the department's programs. A Center for International Forestry serves the department's outreach and research programs.

Outreach and Extension Programs Offered in 2006

Cooperative and Industrial Extension Programs

Cooperative and Industrial Extension Programs	VT Faculty	Location	Dates	No. Participants	Duration (Hours)
Basic Finance for Loggers	R. Shaffer	Covington, VA	Oct. 25	26	3
Chainsaw Safety for Loggers	A. Downing S. Barrett	Caroline County, VA	Aug. 25	56	6
Christmas Tree Workshop	K. Peer and others	Culpeper County, VA	June 3	15	8
		Giles County, VA	June 11	15	5
Fall Forestry and Wildlife Field Tours	J. Gagnon N. Clark K. Cox A. Downing J. Fisher W. Worrell	King William County, VA	Oct. 13	152 total	1 day each
		Greensville County, VA	Oct. 17		
		King George County, VA	Oct. 19		
		Bath County, VA	Oct. 20		
		Grayson County, VA	Oct. 27		
Forestry Best Management Practices & Pre-harvest Planning for Loggers	A. Downing S. Barrett	Lovingston, VA	Mar. 25	11	6
Forestry Hot Topics: Planning for Woodlands in Your Estate	A. Downing	Madison, VA	Nov. 17	66	6
Forming a Forest Landowner Association	A. Downing	Madison, VA	Nov. 27	18	2.5
GPS Basics for Street Tree Inventory	A. Downing A. Bremner	Warrenton, VA	July 17	7	3
GPS for Foresters and Loggers	M. Yancey J. McGee	Harrisonburg, VA	June 29	15	8
Gypsy Moth Program	J. Fisher	Halifax, VA	Feb. 23	22	3
Income from Natural Resources – Now and Later	N. Clark	Suffolk, VA	Sept. 7	18	6
Income Opportunities for Landowners Conference	M. Yancey P. Radtke T. Hammett and others	Clifton Forge	Sept. 8-9	33	16
Introduction to Digital Geospatial Metadata	J. McGee J. Wilson L. Hornbaker	Harrisonburg, VA	July 24	24	8
		Richmond, VA	July 27	16	
		Norfolk, VA	July 28	24	
		Blacksburg, VA	Aug. 9	24	
		Abingdon, VA	Aug. 15	10	
		Danville, VA	Aug. 16	10	
Introduction to Geographic Information Systems for VCE	J. McGee C. Blinn P. Sforza	Blacksburg, VA	Dec. 14-15	27	16

Cooperative and Industrial Extension Programs	VT Faculty	Location	Dates	No. Participants	Duration (Hours)
Living on the Edge Workshop	W. Worrell	Blacksburg	May 31	28	7
Log Grading & Merchandising Workshop for Loggers	A. Downing B. Bond	Orange, VA	Sept. 1	24	6
Logging Safety Overview for Virginia Department of Forestry Water Quality Foresters	R. Shaffer	Blacksburg, VA	June 12	10	3
Project Learning Tree Training	M. Stern M. Adcock	Christiansburg, VA	Sept. 2	9	6
Project WET Training	M. Stern M. Adcock	Blacksburg, VA	Aug. 26	10	6
SHARP Logger Harvest Planning and Best Management Practices (Core Course)	S. Barrett A. Downing W. Worrell J. Fisher M. Yancey	Keysville, VA Lovingston, VA St. Paul, VA Lynchburg, VA Harrisonburg, VA	Feb. 17 Mar. 25 Apr. 7 Sept. 29 Nov. 3	181 total	6 hours each
SHARP Logger Safety Program (Core Course)	S. Barrett A. Downing W. Worrell J. Fisher M. Yancey	Keysville, VA Lovingston, VA St. Paul, VA Lynchburg, VA Harrisonburg, VA	Feb. 10 Mar. 17, Mar. 31 Oct. 6 Nov. 10	167 total	6 hours each
SHARP Logger Sustainable Forestry (Core Course)	S. Barrett A. Downing W. Worrell J. Fisher M. Yancey D. Goerlich	Keysville, VA Lovingston, VA St. Paul, VA Lynchburg, VA Harrisonburg, VA	Feb. 3 Mar. 10 Mar. 24 Sept. 22 Oct. 27	126 total	6 hours each
Small Landowner Field Tour	J. Gagnon N. Clark J. Fisher	Halifax County, VA	Feb. 9	41	8
		Nottoway County, VA	June 14	30	6
		Isle of Wight, VA	Sept. 7	16	6
VDOT Entrance Permits/Flagger Certification/ Underground Utility Safety	S. Barrett	Wintergreen, VA	Apr. 28	8	3
Virginia Master Naturalist Program New Chapter Coordinators' Training	M. Prysby J. Kirwan with others	Douthat State Park, Bath/Alleghany Counties, VA	May 3-5	36	16
Wildlife Options for Landowners	J. Gagnon	Tidewater, VA	Feb. 4	19	7
Wildlife Response to Logging (for landowners)	J. Fisher	Franklin County, VA	Nov. 11	14	7
Woodland Options for Landowners	W. Worrell J. Gagnon	Independence, VA	Mar. 13, 20, Apr. 3, 10	17	12
	M. Yancey J. Gagnon	Catawba, VA	May 25, June 1, 3	31	12
Woodland Options for Landowners (online)	J. Gagnon	Statewide	Mar. 1-May 12	35	-----

Cooperative and Industrial Extension Programs	VT Faculty	Location	Dates	No. Participants	Duration (Hours)
Woodlot Owners Workshop Series – Forest Stewardship	A. Downing	Madison, VA	Aug. 14, 19, Sept. 11, 16, Oct. 16	181 total	2 hours each

Continuing Education Programs

Continuing Education Programs	VT Faculty	Location	Dates	No. Participants	Duration (Hours)
Extension Methods in Forestry	J. Johnson	Santa Cruz, Bolivia	June 8	10	8
Field-based GPS Instruction for Natural Resource Professionals	J. McGee with others	Park City, UT	May 14	20	3
Forest Productivity Workshop	T. R. Fox	Concepcion, Chile	Dec. 8-9	36	16
Gypsy Moth Compliance Training	M. Yancey	Verona, VA	Dec. 12	12	3
Hardwood Silviculture Workshop	T. R. Fox	Covington, VA	Oct. 19-20	25	16
Integrating GIS into the GIS Curriculum at the Community College Level	J. McGee P. Baldassaro	Big Stone Gap, VA	Mar. 30	12	8
Introduction to GIS for the Virginia Department of Health	C. Blinn J. McGee	Blacksburg, VA	July 13-14	20	16
		Richmond, VA	Aug. 10-11	20	
			Aug. 14-15	10	
		Hampton, VA	Aug. 22-23	10	
Introduction to Spatial Analysis for Higher Education Faculty	P. Baldassaro J. McGee	Big Stone Gap, VA	Apr. 20	12	8
Mapping into the Future: GPS for Foresters and Loggers	M. Yancey S. Barrett J. McGee	Harrisonburg, VA	June 29	16	8
North American Natural Resources Extension Forum	J. Johnson	Mattawa, Ontario, Canada	Apr. 9-12	27	26
Northern Virginia Urban Forestry Roundtable	A. Downing	Arlington, VA	Mar. 3	26	3
		Fairfax, VA	May 19	51	
		Leesburg, VA	Sept. 29	31	
Programming in the ArcGIS Environment	P. Baldassaro J. McGee	Big Stone Gap, VA	Nov. 10	12	8
Pruning Basics Lecture, Demonstration & Workshop	A. Downing A. Bremner	Culpeper County, VA	Sept. 12	15	3
2nd Annual Tree Workers' Field Day	A. Downing A. Bremner C. Stafford	Culpeper County, VA	Apr. 28	38	4
Woody Plants at the Roadside: A Workshop on Risk Management	D. Waterman E. Wiseman	Thornburg, VA	May 31-June 1	35	8

Other Outreach Programs

Other Outreach Programs	VT Faculty	Location	Dates	No. Participants	Duration (Hours)
Ask Dr. Dendro	J. R. Seiler	Responded to 500+ questions from around the world submitted via the Department of Forestry's FORSite (Forestry Outreach Website)			
Field Tours for Underserved Landowners	N. Clark	Halifax County, VA	Feb. 9	40	8
	J. Fisher	Nottoway County, VA	June 14	23	
	J. Gagnon	Isle of Wight Co., VA	Sept. 7	16	
Fire Fighter II (Beginning) Training	S. Zedaker	Blacksburg, VA	Oct. 10, 17	6	6
Forest Management Plans	J. Sullivan with R. B. Hull	Eight management plans were completed for one federal government, one city government, and six private landowner clients in the senior FOR 4444 Integrated Forest Management Practicum course.			
Forest Nutrition Cooperative Remote Sensing Workshop	C. Blinn R. Wynne	Blacksburg, VA	Nov. 16-17	12	12
Forest Nutrition Cooperative Contact Meeting Remote Sensing Workshop	R. Wynne C. Blinn R. Rubilar	New Bern, NC	May 12	20	6
Living on the Edge – Community Leader Workshop	S. Zedaker	Winchester, VA	May 9	16	7
		Blacksburg, VA	May 31	27	
		Fredericksburg, VA	June 22	17	
		Denver, CO	Oct. 31	44	
Living on the Edge – Home Owner Workshop	S. Zedaker	Front Royal, VA	May 8	21	3
		Forrest, VA	May 25	31	
Mapping Water Quality: Bringing Science Back to the Classroom	J. McGee J. Kirwan	Portsmouth, VA	April 28-29	30	16
Mapping Water Quality for Fairfax Middle and High School Teachers	J. McGee J. Kirwan B. Fox	Fairfax, VA	Oct. 20-21	28	16
USDA LandCare Study Tour	D. Robertson B. Hull with others	Grayson, Montgomery, and Roanoke Counties, VA	Dec. 6-8	50	16
USDA LandCare Tour	D. Robertson	Grayson County and Blacksburg, VA	June 27-28	16	12
Virginia Master Naturalist Program	M. D. Prysby J. L. Kirwan J. E. Riddell J. E. Johnson	The Virginia Master Naturalist Program is a statewide corps of volunteers providing education, outreach, and service dedicated to the beneficial management of natural resources and natural areas within their communities. Interested Virginians become Master Naturalists through training and volunteer service. The program is jointly sponsored by Virginia Tech and the Virginia Departments of Conservation and Recreation, Forestry, Game and Inland Fisheries, and the Museum of Natural History.			
Wildland –Urban Interface Training	A. Downing	Radford, VA	May 29	21	1

Youth and Teacher Education Programs

Faculty, staff, and students in the Department of Forestry coordinated and/or participated in the following youth and teacher education programs during 2006:

- Traditional 4-H Projects and Activities in Natural Resources
 - Over 10,000 youth are conducting 4-H natural resource projects in Virginia. These projects begin with simple tree identification and tree planting projects and advance to comprehensive judging programs and Envirothon. In 2006 the Envirothon team from Ft. Defiance High School in Augusta County finished first of 52 teams at the international competition in Manitoba, California, and the 4-H forestry judging team from Bath and Dickenson Counties finished second in national competition at Jackson's Mill State 4-H Camp in West Virginia.
 - Franklin County 4-H Junior Camp – Orienteering and global position system (GPS) class for youth ages 9-13 (J. Fisher)
 - 4-H Virtual Forest and Virtual Farm Exhibit Booth at the Virginia State Fair (J. Fisher)
 - "Meaningful Day Experience" In-School 4-H for 1,028 participants in 16 elementary schools in Spotsylvania County (A. Downing)
 - Southampton 4-H Farm Day for 400 third graders and 34 teachers and aides (N. Clark)
- Outreach to Schools and Colleges throughout Virginia
 - Jeff Kirwan, John Seiler, and Marc Stern involved about 20 undergraduate students in service learning activities during 2006. The FORSite program requires students to prepare standards-based forestry lessons for middle-school youth, which they then present to classrooms throughout the local area and region. A separate program involves undergraduate students who receive certification in Project Learning Tree and then lead a 4-H after-school program at local elementary schools. Each summer three to five students intern at 4-H Centers, where they teach forestry classes.
 - Neil Clark participated in Suffolk Farm Day for 1,041 second graders and 72 teachers and aides from 12 elementary schools
 - Karen Cox, along with other Extension agents and volunteers, presented two Eco-expo field trip education events for fourth-grade students in Gloucester, Mathews, and Middlesex Counties; approximately 800 students participated
 - Adam Downing presented a program on Agriculture and Natural Resources to 143 third graders in Madison County
 - Jason Fisher completed a nature trail layout and tree identification with 11 teachers at Altavista Elementary School in Campbell County
 - At a Soil/Water Conservation Field School, Jason Fisher taught a map/compass orienteering class for 35 fifth graders from Halifax, Charlotte, and Mecklenburg Counties
 - Marc Stern trained six Virginia Tech students in Environmental Education and coordinated with four local elementary schools and 4-H to provide after-school programs for students
 - "Trees to Products" field tours for five teachers and one student in Wise and Scott Counties, VA, and Kingsport, TN – W. C. Worrell, J. S. Rockett
- FORSite and Forestry Websites for Youth and Families – J. L. Kirwan, J. R. Seiler

In 2006 we reached over 34,000 unique visitors to websites created and hosted by students and faculty in the Department of Forestry. The largest draw was the Virginia Big Tree Program website, closely followed by the new Remarkable Tree website (online only since May) and FORSite, a website developed exclusively for middle-school students and teachers. All of these websites are enhanced by the nationally-acclaimed Virginia Tech Dendrology and Forest Landowner Fact Sheets, designed to teach the lay public about forestry practices.

- NOAA Watershed Education Project – J. McGee, J. L. Kirwan

This specially funded project provides K-12 teachers in Fairfax County with GPS/GIS training and geo-referenced aerial photos so they can investigate the impacts of land-use change on water quality over time. In addition we provide training so they can conduct their own collaborative tree growth studies at their school. Previously we have worked in the Shenandoah Valley and Hampton Roads. We are partnering with Project Learning Tree to provide this training.

- Chesapeake Tree Planting Project – J. L. Kirwan, P. E. Wiseman, District Agents

This specially funded project provides free hardwood seedlings to youth and families living in the Chesapeake Bay watershed. It is being coordinated by the six district Agriculture/Natural Resource Extension Agents and involves many agency partners such as Soil and Water Conservation Districts and Clean City Commissions.

- Virginia Residential Governor's School for Agriculture at Virginia Tech

Eric Wiseman served as advisor to four students in a natural resources independent study group project entitled "Determining the Dollar Value of Oak Lane Community's Urban Forest at Virginia Tech."

- Project Learning Tree

Project Learning Tree (PLT) is a national award-winning environmental education program for educators working with students in Pre-K through grade 12. It is sponsored by the American Forest Foundation; primary responsibility for administering PLT in Virginia rests with the Virginia Department of Forestry, with fiscal and administrative oversight provided by the Virginia Forestry Association. PLT helps students gain awareness and knowledge of the natural and built environment and their place within it, as well as their responsibility for it.

PLT Workshops for 32 teachers in Russell and Smyth Counties – W. C. Worrell

- Christmas Tree Farm Tours – Patrick County – K. R. Peer

169 youth and 73 adults participated in nine tours

- "Trees are Good" – Arbor Day Celebrations (2) – Madison County – A. K. Downing

733 participants

Newsletters and Magazine Columns Published

Academic News

Regular column in *The Log*, newsletter of the Mid-Atlantic Chapter of the International Society of Arboriculture; produced by S. D. Day

Forestry For'um

Quarterly newsletter distributed to 800+ landowners, foresters, extension agents, and cooperators as an update for upcoming professional education programs; produced by J. Fisher

IFO Co-op Newsletter

Distributed biannually to 55 cooperators and interested individuals; produced by R. Visser

The Logroll: Notes and News for Loggers

Quarterly column in the Virginia Forestry Association's *Virginia Forests* magazine; produced by R. M. Shaffer

SHARP Logger Newsletter

Quarterly distribution to approximately 2,000 loggers and foresters; produced by S. M. Barrett and R. M. Shaffer

TREE Cookies Etc.

Bi-monthly electronic newsletter which provides unbiased research-based information on forest stewardship, tree care, and natural resource management; produced by A. K. Downing

Virginia Forest Landowner Update

Quarterly newsletter distributed to 22,000 forest landowners and natural resource professionals; produced/edited by J. L. Gagnon

The Virginia Geospatial Newsletter

Quarterly newsletter distributed to approximately 2,000 individuals and organizations throughout the Commonwealth; produced by J. A. McGee

The Woodshed

Online newsletter that provides information on natural resources and forestry-related programming in the Northwest District of Virginia; produced by M. W. Yancey

World Wide Web Sites Developed and Maintained

Amateis, R. L. Virginia Tech Loblolly Pine Growth and Yield Research Cooperative.
www.cnr.vt.edu/g&y_coop

Baldassaro, P. M. and J. A. McGee. The Virginia Geospatial Academy (Provides public access and points of contact to geospatial educational opportunities at the precollege, higher education, and professional development levels; contains contacts from academic, private, and non-profit entities)
<http://www.cnr.vt.edu/geoacademy>

Barrett, S. M. and R. M. Shaffer. Virginia SHARP Logger Program.
www.sharplogger.vt.edu

Burger, J. A. Forest Soils Program (Provides teaching, research, and outreach activities of the forest soils program at Virginia Tech)
<http://soils.fw.vt.edu/>

Day, S. D. University of Costa Rica Scholar Collaboration Site (Created for information sharing among faculty at Virginia Tech and at the University of Costa Rica to facilitate research collaboration and student exchange)
<https://scholar.vt.edu/portal/tool/gateway-410?panel=Main>

Day, S. D., J. R. Seiler and J. A. Peterson. Virginia Urban Street Tree Selector. (Currently in a beta version, this site helps professionals and others select tree species for downtown streets, parking lots, and other urban sites. The site is linked with the dendrology databases.)
www.cnr.vt.edu/dendro/treeselector

- Day, S. D. and P. E. Wiseman. Urban Forestry Gateway at Virginia Tech (Links all urban forestry information at Virginia Tech, including information for prospective undergraduate and graduate students, faculty research from several departments, scholarship information, and outreach sites)
www.cnr.vt.edu/urbanforestry/
- Downing, A. K. TREE Cookies, Etc. (An electronic newsletter for persons interested in natural resources in rural, urban, or interface areas; two issues in 2006)
http://offices.ext.vt.edu/view.cfm?webname=arlington§ion=newsletters_a&idn=9814
- Fox, T. R. and H. L. Allen (North Carolina State University). Forest Nutrition Cooperative.
www.forestnutrition.org
- Gagnon, J. L. Virginia Forest Landowner Update Online.
www.cnr.vt.edu/forestupdate
- Goerlich, D. L., J. L. Kirwan and others. 4-H Virtual Forest (Provides youth with an interactive web-based learning experience that introduces the concepts of forest management to young people ages 9-13. Learning modules complement 4-H experiential techniques and are consistent with the Standards of Learning for Virginia public schools.)
<http://www.ext.vt.edu/resources/4h/virtualforest/>
- Kirwan, J. L.. Virginia Big Tree Program Site.
<http://www.cnr.vt.edu/4h/bigtree/index.htm>
- Kirwan, J. L. Virginia 4-H Natural Resources and Environmental Education (NREE) Projects. . (Outlines programs, projects, and activities available to 4-H clubs in Virginia)
<http://www.ext.vt.edu/resources/4h/eenr.html>
- Kirwan, J. L. Virginia Project Learning Tree. (Provides SOL correlations and resources for teachers who use PLT in their classrooms)
<http://www.cnr.vt.edu/plt/>
- Kirwan, J. L. and D. Dunlap. NOAA Watershed Project. (Provides GIS data products, including historic aerial photographs, for high school teachers in the Potomac and Shenandoah Valleys)
www.watershedded.org/
- McGee, J. A. The Virginia Geospatial Extension Program (Provides overview, data and software resources, articles, and workshop materials to support geospatial activities through pre-college, higher education, local, state, and federal geospatial initiatives in Virginia)
<http://www.cnr.vt.edu/gep/>
- Merry, F. D. and G. S. Amacher. International Forestry Center at Virginia Tech.
www.cnr.vt.edu/ifc/FMerry/pages/IFChome.htm
- Peterson, J. A. and J. R. Seiler. Forest Biology and Dendrology Educational Site. (Provides an electronic textbook for basic tree biology, fact sheets for 940 tree species, and an interactive "Ask Dr. Dendro" site to get tree-related questions answered)
www.cnr.vt.edu/dendro
- Prysby, M. D. Virginia Master Naturalist Program. (Communicates about, markets, and publicizes the Virginia Master Naturalist Program.
www.virginiamasternaturalist.org

Robertson, D. P. Blue Ridge Forest Cooperative (BRFC). (BRFC is a forest products business that operates as a network of landowners, investors, service providers, and other partners committed to sustainable forestry in the Blue Ridge region of Virginia.)
www.briconline.com

Robertson, D. P. Grayson LandCare. (Grayson LandCare is a community-based organization helping landowners practice landcare in the New River Valley of southwest Virginia.)
www.graysonlandcare.org

Robertson, D. P. Greater Lynchburg Environmental Network (GLEN). (GLEN is a civic organization working to improve environmental quality in the Greater Lynchburg ecosystem.)

Robertson, D. P. LandCare Center. (The LandCare Center is a partnership initiative to advance the science and practice of landcare in the Commonwealth of Virginia and beyond.)
www.landcarecenter.org

Robertson, D. P. Landcare Central (The Landcare Central website promotes landcare as an approach to land management for today's landscapes, lifestyles, and livelihoods.)
www.landcarecentral.org

Robertson, D. P. SEED. (SEED is a content management system that allows community-based groups to create websites and interact for low-cost.)
www.publicecology.org/SEED

Seiler, J. R., W. M. Aust and J. A. Peterson. Forest Biology and Ecology for Educators.
www.cnr.vt.edu/dendro/forbioeco/index.html

Seiler, J. R., J. L. Kirwan, J. A. Peterson and A. N. Meeks. FORSite - Forestry Outreach Site for Virginia Middle Schools. (Provides forestry resources to middle schools, with emphasis on tree identification and data collection)
<http://www.cnr.vt.edu/dendro/forsite/contents.htm>

Virginia Tech Department of Forestry Site. Website maintained by C. Linkous.
www.cnr.vt.edu/forestry/

Visser, R. and T. Sherman. Cable Logging/Cable Yarding Site.
www.cnr.vt.edu/visser/cable_logging/

Visser, R. and T. Sherman. Harvesting Systems.
www.cnr.vt.edu/harvestingsystems

Visser, R. and T. Sherman. Industrial Forest Operations Cooperative.
www.cnr.vt.edu/ifo

Visser, R. and T. Sherman. Stream Crossing Options.
www.cnr.vt.edu/visser/streamcrossings/

Technical Assistance Program (TAP) Projects

Wiseman, P. E. Hill Studio Technical Assistance Projects (2).
Provided technical assistance for Hill Studio, a Roanoke-based landscape architecture firm, by (1) preparing a landscape tree assessment report for a portion of University of Virginia-Wise Campus and (2) preparing a landscape tree preservation report for a portion of University of Virginia-Wise Campus.

THESES AND DISSERTATIONS FOR GRADUATE DEGREES AWARDED IN 2006

For calendar year 2006 – 2 Ph.D., 11 M.S., 2 M.F. degrees awarded

- Ashton, Sarah F. Second Summer 2006. A study of cooperative ventures addressing the needs of forest landowners in southern Appalachia. M.S.
Faculty Co-Chairs: R. B. Hull and R. Visser
Current Position: Program Coordinator, Regional Extension Forestry, University of Georgia, Athens, GA
- Bernard, Aaron M. First Summer 2006. Geospatial modeling of forest road networks and their effect on stream macroinvertebrate communities. M.S.
Faculty Chair: S. P. Prisley
Current Position: GIS Analyst, U.S. Army Corps of Engineers, Topographic Engineering Center, Fort Belvoir, VA
- Bowman, Maria S. Fall 2006. Smallholder fire prevention and burning activities under the threat of accidental fire: A household model application from the Tapajós National Forest in the State of Pará, Brazil. M.S.
Faculty Chair: G. S. Amacher
Current Position: Research Associate, Woods Hole Research Center, Brazil
- Bullock, Steven D. Second Summer 2006. Integrating quantitative and qualitative research methods to inform management of the Cadillac Mountain Summit, Acadia National Park. M.S.
Faculty Chair: S. R. Lawson
Current Position: Recreation Management, USDA Forest Service, Wasatch-Cache National Forest, Utah
- Elliot, J. Robertson, III. Fall 2006. The effects of a controlled-release nitrogen fertilizer on the nitrogen dynamics of a mid-rotation loblolly pine plantation in the Piedmont of Virginia. M.S.
Faculty Chair: T. R. Fox
Current Position: Forester, Westervelt Company, Tuscaloosa, AL
- Feldt, Robert A. Spring 2006. Soil erosion from forest roads in the Piedmont and Allegheny Plateau regions. M.F.
Faculty Chair: W. M. Aust
Current Position: Chesapeake Watershed Forestry Coordinator, Maryland DNR Forest Service, Annapolis, MD
- Flatley, William T. Second Summer 2006. Successive land surveys as indicators of vegetation change in an agricultural landscape. M.S.
Faculty Chair: C. A. Copenheaver
Current Positions: Ph.D. candidate, Texas A&M University, College Station, TX
- Harrell, Charles W. Fall 2006. Effects of prescribed burning, mechanical and chemical treatments to curtail rhododendron dominance and reduce wildfire fuel loads. M.S.
Faculty Chair: S. M. Zedaker
Current Position: Forester, Forest Resource Management, Florence, SC

- Hodges, Christine L. Fall 2006. Logging in the streamside management zone: Effects of harvesting system and intensity on visual soil disturbance. M.S.
Faculty Chair: R. Visser
Current Position: Extension Agent, 4-H and Youth, Virginia Cooperative Extension, Bath County, Virginia
- O'Neal, Brandon S. Spring 2006. Safety training for Spanish-speaking workers in the logging industry in the southeastern United States. M.S.
Faculty Chair: R. M. Shaffer
Current Position: Ph.D. candidate, Auburn University, Auburn, AL
- Salzberg, Adam M. Spring 2006. Sugar maple growth on reclaimed mine soils in southwestern Virginia. M.F.
Faculty Chair: J. A. Burger
Current Position: Consultant, Highland Forestry, Blacksburg, VA
- Sypert, Robert H. Second Summer 2006. Diagnosis of loblolly pine (*Pinus taeda* L.) nutrient deficiencies by foliar methods. M.S.
Faculty Chair: T. R. Fox
Current Position: Research Forester, Resource Management Service, LLC, Birmingham, AL
- Trincado, Guillermo F. Second Summer 2006. Dynamic modeling of branches and knot formation in loblolly pine (*Pinus taeda* L.) trees. Ph.D.
Faculty Chair: H. E. Burkhart
Current Position: Assistant Professor, Instituto de Manejo Forestal, Universidad Austral de Chile, Valdivia, Chile
- VanderSchaaf, Curtis L. Fall 2006. Modeling maximum size-density relationships of loblolly pine (*Pinus taeda* L.) plantations. Ph.D.
Faculty Chair: H. E. Burkhart
Current Position: Assistant Professor, School of Forest Resources, University of Arkansas at Monticello, Monticello, AR
- Wood, Kerry T. Spring 2006. Assessing recreation impacts to cliffs in Shenandoah National Park: Integrating visitor observation with trail and recreation site measurements. M.S.
Faculty Chair: S. R. Lawson
Current Position: Volunteer Coordinator, Appalachian Trail Conservancy, Blacksburg, VA

2006 EDITORSHIPS, AWARDS, AND ACHIEVEMENTS

Gregory Amacher

Senior Editor (Forestry and Economics), *Natural Resource Modeling*
Editorial Council, *Journal of Environmental Economics and Management*
Affiliate Researcher, The Institute of Environmental Research for Amazônia (Instituto de Pesquisa Ambiental do Amazonia – IPAM), Belem, Brazil

Michael Aust

College of Natural Resources Curriculum Clubs Award for Teaching Excellence, 2006
Certified Forester, Society of American Foresters

Amy Brunner

Board of Advisors, *New Phytologist*

James Burger

Fellow, Soil Science Society of America

Harold Burkhart

University Distinguished Professor of Forestry
Fellow, Society of American Foresters
Fellow, American Association for the Advancement of Science
Review Board, *International Journal of Environmental Research*
International Scientific Committee, *Annals of Forest Science*
Board of Directors, Forest Landowners Association
Board of Directors, Virginia Forestry Association
Advisory Committee, Reynolds Homestead
Certified Forester, Society of American Foresters

Susan Day

Member, Soils Sub-Committee, Sustainable Sites Initiative (national committee)
Member, International Society of Arboriculture Science and Research Committee

Adam Downing

National Association of County Agricultural Agents Communication Award – National Finalist,
Radio - 2006
National Association of County Agricultural Agents Achievement Award – State Winner, 4-H &
Youth Recognition Program, 2006
National Association of County Agricultural Agents Communication Award – State Winner,
Individual Newsletter, 2006
Southern Regional Extension Forestry Exceptional Programming Award, 2006
Virginia Division of the Society of American Foresters, Young Forester Leadership Award, 2006
Association of Natural Resource Professionals Gold Award – Refereed Journal Article, 2006

Jason Fisher

Southern Regional Extension Forestry Award for Excellence in Mixed Media-Youth and Teacher
Education, 2006 – for 4-H Virtual Forest (along with D. Goerlich, J. Kirwan, and others)

Thomas Fox

Adjunct Faculty Appointment, North Carolina State University
Co-Director, NCSU/VPI&SU Forest Nutrition Cooperative
Associate Editor, *Soil Science Society of America Journal*
Certified Forester, Society of American Foresters
Certified Professional Soil Scientist, American Society of Agronomy
Registered Professional Forester (Georgia)
Licensed Professional Forester (Maine)

Bruce Hull

Fellow, Virginia Natural Resource Leadership Institute

James Johnson

International Service Award, Association of Natural Resource Extension Professionals, 2006
Associate Editor, *Small-Scale Forest Management, Economics and Policy*
Board of Directors, Virginia Forestry Association
Certified Forester, Society of American Foresters
Fellow, Society of American Foresters

Steven Lawson

Associate Editor, *Journal of Park and Recreation Administration*

Jeffrey Marion

Associate Editor, *Journal of Environmental Management*
Associate Editor, *International Journal of Wilderness*
Advisory Board, International Centre for Ecotourism Research, Queensland, Australia

Richard Oderwald

Associate Editor for Geospatial Technologies, *Journal of Forestry*

Stephen Prisley

Director, Virginia Tech Center for Geospatial Information Technology (CGIT)

Philip Radtke

Associate Editor, *Forest Science*

Marion Reynolds

Editorial Board, *Journal of Quality Technology*
Editorial Board, *Sequential Analysis*
Editorial Board, *IIE Transactions*

David Robertson

Director, The LandCare Center
Director, The Public Ecology Project
Director, Greater Lynchburg Environmental Network
Public Director, Blue Ridge Forest Cooperative
Steering Committee Member, Middle James Roundtable
Member, Southside Implementation Team, Virginia Tech

Joseph Roggenbuck

Associate Editor, *Leisure Sciences*
Associate Editor, *International Journal of Wilderness*

John Seiler

The Honorable and Mrs. Shelton H. Short, Jr., Professor of Forestry
Editorial Board, *Tree Physiology*

Robert Shaffer

Charles Nettleton Professor of Forestry

Jay Sullivan

Associate Editor, *Forest Science*

Rien Visser

Assistant Editor (Forestry Section), *Transactions of American Society of Agricultural Engineers*
Division Editor (Forestry Section), *Transactions of American Society of Agricultural Engineers*

Randolph Wynne

Guest Co-editor, Special issue of *Photogrammetric Engineering & Remote Sensing* devoted to
forestry lidar applications, December 2006

Shepard Zedaker

Silviculture Prize – for best paper published in the *Journal of Forestry* in 2006
Editorial Board, *New Forests*
Advisory Board, *Weed Technology*

PROFESSIONAL PRESENTATIONS MADE DURING 2006

(Presenter's name indicated in **bold**; * denotes graduate student)

- Adams, M. B. and **J. A. Burger**. Changes in soil chemistry resulting from whole-tree harvesting, acidification, and ameliorative liming. Soil Science Society of America Annual Meeting, Indianapolis, IN.
- Allen, H. L.** and T. R. Fox. Ecophysiological basis for productivity in intensively managed plantations. Congreso Chileno de Ciencias Forestales, Concepcion, Chile.
- Amacher, G.**, E. Koskela and M. Ollikainen. Property rights and deforestation. Department of Environmental Studies, Dartmouth College, Hanover, NH
- Amateis, R. L.** Growth and yield models: Tools for forest managers. Virginia Chapter of the Association of Consulting Foresters of America, Charlottesville, VA.
- Amateis, R. L.** Whole rotation stand density management of loblolly pine: Field studies to models. South Carolina Forest Landowners Meeting, Columbia, SC.
- Amichev, B. Y.*** and James A. Burger. Soil organic carbon measurement procedure for mine soils. Soil Science Society of America Annual Meeting, Indianapolis, IN.
- Arellano, E.*** and T. R. Fox. Changes in soil nutrient availability following land application of biosolids to forests in Virginia. World Congress of Soil Science, Philadelphia, PA.
- Arellano, E.*** and T. R. Fox. Impact of biosolids application on soil nutrient dynamics. Soil Science Society of America Annual Meeting, Indianapolis, IN.
- Aust, W. M.** Assessment of restored riparian forests on agricultural lands in Virginia. Chesapeake Bay Program Forestry Working Group, Winchester, VA.
- Aust, W. M.** Evaluation of the CREP program in Virginia. Virginia Department of Forestry-USDA Forest Service Technical Advisory Visit, Blacksburg, VA.
- Aust, W. M.** Forested wetlands. Master Naturalist Program, Blacksburg, VA.
- Aust, W. M., R. Visser, **W. Lakel*** and B. O'Neal*. AVLO road costing spreadsheet. 29th Annual Meeting of the Council on Forest Engineering, Coeur 'd Alene, ID.
- Bartens, J.***, S. D. Day and J. R. Harris. Trees and structural soil as a stormwater management system in urban settings: Tree development and contribution. Urban Forestry: Bridging Cultures, Disciplines, Old Attitudes & New Demands, 9th European Forum on Urban Forestry, Florence, Italy.
- Bernard, A. M.***, S. P. Prisley, W. M. Aust and C. D. Heatwole. Geospatial modeling of forest road networks and their effects on stream macroinvertebrate communities. 5th Southern Forestry and Natural Resources GIS Conference, Asheville, NC.
- Burge, S.**, J. Stokoe, R. McWilliams, T. Jacobs, S. Hoesel, P. Tadej, J. Moles, D. Robertson and E. Miller. Emerging Landcare examples in the United States. 2006 International LandCare Conference, Melbourne, Australia.
- Burkhart, H. E.** A growth and yield perspective. Post-harvest Stand Development Conference, Edmonton, Alberta, Canada.

- Burkhart, H. E.** Initial spacing: A key factor in plantation management. North Carolina Forest Service Symposium, Sanford, NC.
- Burkhart, H. E.** Myths and realities of initial planting spacing. Symposium on Getting to the Root of Regeneration Success and Failure, Danville, VA.
- Burkhart, H. E.** Virginia Tech's forestry programs – Current status, future directions. Symposium on Getting to the Root of Regeneration Success and Failure, Danville, VA.
- Burkhart, H. E. and R. L. Amateis.** Growth and yield modeling. Virginia Department of Forestry 2006 Resource Management Academy, Smith Mountain Lake 4-H Educational Center, Wirtz, VA.
- Bartens, J.***, J. R. Harris and S. D. Day. Trees and structural soils as a stormwater management system in urban settings. Southern Nursery Association Research Conference, Atlanta, GA. (Poster)
- Blinn, C. E.** Forest Nutrition Cooperative remote sensing project. Forest Nutrition Cooperative Advisory Council Meeting, Chapel Hill, NC.
- Blinn, C. E.**, R. H. Wynne and J. A. Scrivani. Improvements from training data editing and band combination selection on forest/non-forest classifications of Landsat ETM+ imagery. 72nd Annual Meeting of the American Society for Photogrammetry and Remote Sensing, Reno, NV.
- Bullock, S.*** and S. Lawson. Examining the effects of management actions on visitor experiences and associated meanings on the summit of Cadillac Mountain, Acadia National Park. International Symposium on Society and Resource Management, Vancouver, BC, Canada.
- Bullock, S.* and **S. Lawson.** Managing the “commons” on Cadillac Mountain: A stated choice analysis of visitors’ management preferences. International Symposium on Society and Resource Management, Vancouver, BC, Canada.
- Bullock, S.*** and S. Lawson. Searching for “mutually agreed upon coercion” to protect the “commons” on Cadillac Mountain: A stated choice analysis. Southeastern Recreation Research Conference, Wilmington, NC.
- Carlson, C. A.** and T. R. Fox. Loblolly pine growth response to surface and subsurface tillage. Forest Nutrition Cooperative Annual Meeting, Blacksburg, VA.
- Carlson, C. A.** and T. R. Fox. Using the age-shift approach to model mid-rotation fertilizer responses. Forest Nutrition Cooperative Annual Meeting, Chapel Hill, NC.
- Choi, J.**, H. E. Burkhart and R. L. Amateis. Trends in stem quality of loblolly pine trees. Southern Mensurationists Annual Meeting, Charleston, SC.
- Clark, N.** Alternative forest products for southeast Virginia. Income from Natural Resources – Now and Later, Suffolk, VA.
- Clark, N.** Forest management in southeast Virginia: Concentration – Prince George & Chesterfield. Chesterfield Farmer's Breakfast, Chesterfield, VA.
- Clark, N.** 4-H Virtual Farm and 4-H Virtual Forest. 2006 Virginia State Fair, Richmond, VA.
- Clark, N.** From seed to seedling. Southampton 4-H Farm Day, Southampton County, VA.
- Clark, N.** History and future of forests – Foreign and domestic. Chesapeake Chapter of the Izaak Walton League, Suffolk, VA.

- Clark, N.** Introduction to Forestry and Natural Resources Southeast District extension agent. Suffolk Kiwanis Meeting, Suffolk, VA.
- Clark, N.** Land conservation strategies. Isle of Wight Board of Supervisors Meeting, Isle of Wight, Virginia.
- Clark, N.** Land use as related to turkeys in southeast Virginia. Suffolk Longspurs JAKES Event, Suffolk, VA.
- Clark, N.** Tree structures and functions. Suffolk Farm Day, Suffolk, VA.
- Clark, N., P. Araman and S. Lee.** Urban tree crown evaluation efforts. Forest Health Monitoring Working Group Meeting, Charleston, SC.
- Clark, N. and S. Lee.** Digital photomonitoring for tree crown foliage change evaluation. 15th Central Hardwood Conference, Knoxville, TN.
- Copenheaver, C. A.** Tree-ring analysis from bottomland hardwood stand, USA. 7th International Conference on Dendrochronology, Beijing, China.
- Creighton, J. H., J. E. Johnson and E. R. Norland.** Providing successful learning opportunities in forestry extension: An international comparison. Southern Regional Conference on Technology Transfer and Extension in Natural Resources, Hot Springs, AR.
- Currie, J.*, R. Visser, R. Smith and C. Becker.** Developing a business model for the harvesting of small diameter timber for private landowners in Virginia. Forest Resources Association, Richmond, VA.
- Daversa, D. R., **S. P. Prisley** and M. J. Mortimer. Spatial analysis of potential impacts of local forestry ordinances. 5th Southern Forestry and Natural Resources GIS Conference, Asheville, NC.
- Day, S. D.** Buried trunks: Diagnosis and remediation of trees damaged by deep planting or construction fill. Grow in Winter Workshop, Landscape Contractors Association of Maryland, District of Columbia, and Virginia, Ellicot City, MD.
- Day, S. D.** In search of space: Landscape design and how it affects tree growth in urban sites. Growing Green: Strategies for Success, Community Tree Conference 2006 – Amherst, MA.
- Day, S. D.** The key to long-term success with your tree plantings. Virginia Tree Steward Training Session, 19th Annual Virginia Cooperative Extension Master Gardener College, Blacksburg, VA.
- Day, S. D.** Looking ahead—Urban forests and natural resource protection. Trees: The Oldest New Thing in Storm Water Management, 15th Annual Conference of Arkansas Urban Forestry Council, Fayetteville, AR.
- Day, S. D.** Stormwater management with trees and structural soil. Trees: The Oldest New Thing in Storm Water Management, 15th Annual Conference of Arkansas Urban Forestry Council, Fayetteville, AR.
- Downing, A. K.** Backyard woods. Introduction to Riparian Buffers (part of Clarity Workshop Series), Gloucester Point, VA.
- Downing, A. K.** Reaching beyond the choir: To underserved private forest landowners with "one-stop-shop" conferences. 91st Annual Meeting and Professional Improvement Conference for National Association of County Agricultural Agents, Cincinnati, OH.
- Downing, A. K.** Tree identification. Fauquier Master Gardener Volunteer Training Course, Fauquier County, VA.

- Downing, A. K.** Tree identification. 4th Annual Woods and Wildlife Conference, Manassas, VA, and Charlottesville, VA.
- Downing, A. K.** Tree identification. Tree Identification Meeting, Loudoun County, VA.
- Downing, A. K.** Working with small acreage forestland owners. Virginia Department of Forestry 2006 Resource Management Academy, Smith Mountain Lake 4-H Educational Center, Wirtz, VA.
- Fearer, T. M.***, D. F. Stauffer, S. P. Prisley and P. D. Keyser. Evaluating population-habitat relationships of forest breeding birds and multiple scales using forest inventory data. 5th Southern Forestry and Natural Resources GIS Conference, Asheville, NC.
- Fearer, T. M.***, D. F. Stauffer, S. P. Prisley and P. D. Keyser. Evaluating population-habitat relationships of forest breeding birds and multiple scales using forest inventory data. 8th Annual Forest Inventory and Analysis Symposium, Monterey, CA.
- Fisher, J. K.** Trees and shrubs. Presentations to Master Gardeners in Halifax County and Brunswick County, VA.
- Flatley, W. T.*** and C. A. Copenheaver. Dendroecology of *Juniperus-Quercus* woodland, USA. 7th International Conference on Dendrochronology, Beijing, China.
- Fox, T. R.** and H. L. Allen. Sustainability of plantation forestry. Congreso Chileno de Ciencias Forestales, Concepcion, Chile.
- Fox, T. R.**, C. A. Haas and R. Jones. What mechanisms control biodiversity, resilience and nutrient processes in managed Appalachian forest ecosystems. Soil Science Society of America Annual Meeting, Indianapolis, IN.
- Fox, T. R.**, R. Rubilar, H. Allen, C. Montes, J. Urrego and F. Flores. Precision forestry in the 21st century: Linking climate, geology, topography, and ecophysiology to develop site-specific estimates of forest productivity for pine and eucalyptus in North and South America. World Congress of Soil Science, Philadelphia, PA.
- Gagnon, J. L.** Ecology and management of longleaf pine. Fall Forestry and Wildlife Field Tour - King William County, Sandy Point State Forest, VA.
- Gagnon, J. L.** Forest and farmland conservation strategies. Virginia Forestry Association Annual Meeting, Wintergreen, VA.
- Gagnon, J. L.** Forestry and the forest products industry in Virginia. Agricultural Engineering class, Blacksburg, VA.
- Gagnon, J. L.** Sustainable forest management and management planning. Wildlife Options for Landowners Short Course, Tappahannock, VA.
- Gagnon, J. L.** The Virginia Forest Landowner Education Program. Virginia Association of Parks Annual Meeting, Claytor Lake, VA.
- Johnson, J. E.** Environmental effects of prescribed burning. Virginia Certified Prescribed Burning Manager Program, Charlottesville, VA.
- Johnson, J. E.** How a forest grows – Mechanics, ecology and service to society. Woods and Wildlife Conference, Manassas, VA.

- Johnson, J. E.** International opportunities in forestry extension. North American Natural Resources Extension Forum, Mattawa, Ontario, Canada.
- Johnson, J. E.** International opportunities in forestry extension. Western Extension Forestry Conference, Fairbanks, AK.
- Johnson, J. E.** LandCare – An experiment in cooperation. LandCare Meeting, Independence, VA.
- Johnson, J. E.** LandCare programs in Australia and the USA. LandCare Meeting, Blacksburg, VA.
- Johnson, J. E.** New happenings in forestry extension in Virginia. Symposium on Getting to the Root of Regeneration Success and Failure, Danville, VA.
- Johnson, J. E., J. H. Creighton and E. R. Norland.** Evaluating successful strategies in forestry extension: An international perspective. 5th Natural Resources Extension Professionals Conference, Park City, UT.
- Kays, J., A. Downing and J. Finley.** The woods in your backyard. Southern Regional Conference on Technology Transfer and Extension in Natural Resources, Hot Springs, AR.
- Kelly, J. M. and R. Yanai.** Writing manuscripts for publication. Soil Science Society of America Annual Meeting, Indianapolis, IN.
- Kirwan, J. L., J. R. Seiler and M. D. Prysby.** The Virginia Tech forestry outreach program. 5th Natural Resources Extension Professionals Conference, Park City, UT.
- Kirwan, J. L., J. R. Seiler and M. D. Prysby.** The Virginia Tech forestry outreach program. 11th Annual Service Learning Exposition, Blacksburg, VA.
- Kiser, B.* and S. Lawson.** Examining the utility of computer simulation for monitoring multiple dimensions of wilderness solitude in Great Smoky Mountains National Park. Southeastern Recreation Research Conference, Wilmington, NC.
- Kiser, B.*, S. Lawson and B. Itami.** Using computer simulation to monitor wilderness solitude in Great Smoky Mountains National Park. International Conference on Monitoring and Management of Visitor Flows in Recreational and Protected Areas, Rapperswil, Switzerland.
- Lakel, W. A.*, W. M. Aust and C. A. Dolloff.** 2006. Effects of streamside management zones on water quality in Virginia. 29th Annual Meeting of the Council on Forest Engineering, Coeur 'd Alene, ID.
- Laven, D., **R. Manning**, W. Valliere, J. Marion and S. Lawson. Ecology and sociology of parks: An integrated study at Acadia National Park. International Symposium on Society and Resource Management, Vancouver, BC, Canada.
- Lawson, S., B. Kiser*, L. Park*, K. Plotkin, B. Itami, K. Fristrup, D. Joyce and K. Trevino.** Understanding and managing soundscapes in national parks: Part 3 – computer simulation. International Conference on Monitoring and Management of Visitor Flows in Recreational and Protected Areas, Rapperswil, Switzerland.
- Lee, S., A. Abbott, N. Clark and P. Araman.** Diffusion on statistical manifolds. International Conference on Image Processing, Atlanta, GA.
- Lee, S., A. Abbott, N. Clark and P. Araman.** A shape representation for planar curves by shape signature harmonic embedding. IEEE Computer Society Conference on Computer Vision and Pattern Recognition, New York, NY.

- Marion, J. L.** Alternative approaches to campsite and trail monitoring. Southern Wilderness Rendezvous, Region 8, USDA Forest Service, Helen, GA.
- Marion, J. L.** Developing indicators for wildlife-visitor interactions: Value, feasibility and limitation. New England Chapter of The Wildlife Society Fall Workshop, Hadley, MA.
- Marion, J. L.** Integrating recreation ecology and social science research: Panel discussion. 12th International Symposium on Society and Resource Management, Vancouver, Canada.
- Marion, J. L.** Integrating recreation ecology and social science research: Presentations on recent studies. 12th International Symposium on Society and Resource Management, Vancouver, Canada.
- Marion, J. L.** Leave No Trace skills and ethics. Boy Scouts of America, Blue Ridge Mountains Council, Roanoke, VA.
- Marion, J. L.** Leave No Trace skills and ethics. Boy Scouts of America, Regional High Adventure Conference, Lebanon, PA.
- Marion, J. L.** Managing "trail magic" along the Appalachian trail. Appalachian Long Distance Hikers Association Annual Gathering, Athens, WV.
- Marion, J. L.** Managing visitor use impacts in wilderness: Implications from wilderness research. Southern Wilderness Rendezvous, Region 8, USDA Forest Service, Helen, GA.
- Marion, J. L.** Recreation impacts and methodological considerations for their assessment and monitoring. Haleakala National Park - Recreation and Commercial Use Meeting, Maui, HI.
- Marion, J. L.** Recreation impacts to cliff resources: Study objectives and methods. Great Falls Park, George Washington Memorial Parkway, Public Meetings (2), Great Falls, VA.
- Marion, J. L.** Recreational use and impact to cliff resources in Shenandoah National Park. Shenandoah National Park, Cliff Study Public Workshop, Luray, VA.
- Marion, J. L.** Unassisted recovery at Annapolis Rocks: The Appalachian Trail's most severely impacted campsites. Patuxent Wildlife Research Center, Biennial Science Meeting, Laurel, MD.
- Marion, J. L.** Visitor impacts to wildlife and their management: An overview. New England Chapter of The Wildlife Society Fall Workshop, Hadley, MA.
- McGee, J.** Creating geospatial metadata the Virginia way. 18th Annual Virginia GIS Conference, Richmond, VA.
- McGee, J.** Geospatial workforce opportunities in Virginia (breakout session). Virginia Community College System Career Coaches Conference, Roanoke, VA.
- McGee, J.** Geospatial workforce opportunities in Virginia (preliminary session). Virginia Community College System Career Coaches Conference, Roanoke, VA.
- McGee, J.** Helping communities through the Virginia Geospatial Extension Program (poster session). Outreach Now, Blacksburg, VA.
- McGee, J.** Integrating GIS in the community college curriculum. Virginia Community College System New Horizons Conference, Roanoke, VA.

- McGee, J.** Synergistic opportunities through the National Geospatial Technology Extension Workshop (NGTEN). The Environmental Systems Research Institute (ESRI) Federal User Group Meeting, Washington, DC.
- McGee, J., A. Hays, **B. Orr**, S. Prisloe and P. Rasmussen. The National Geospatial Extension Program: Applications, impacts, and opportunities for natural resource management professionals. Annual Natural Resource Extension Professionals Conference, Park City, UT.
- Miller, B.*** and T. R. Fox. Impact of P fertilization on soil P fractions. Soil Science Society of America Annual Meeting, Indianapolis, IN.
- Miller, B.*** and T. R. Fox. The long-term effects of a single phosphorus fertilizer application on phosphorus availability in forest soils. World Congress of Soil Science, Philadelphia, PA.
- Moldovanyi, A.,** S. Lawson and B. Kiser*. Comparing internet and onsite survey modes for a visitor use study at Prince William Forest Park, Virginia. Southeastern Recreation Research Conference, Wilmington, NC.
- Mortimer, M. J.** Advocacy vs. lobbying. Society of American Foresters 2006 National Convention, Pittsburgh, PA.
- Mortimer, M. J.** Forester credentialing: Definitions—getting the terms right. Appalachian Society of American Foresters Annual Meeting, Charlottesville, VA.
- Mortimer, M. J.** Landowner liability: The myths, truths and what you need to know. Fourth Annual Landowners' Woods & Wildlife Conference, Manassas and Charlottesville, VA.
- O'Neal, B. S.***, W. M. Lakel, W. A. Aust and R. M. Visser. 2006. AVLO: A simplified cost analysis approach for estimating construction costs of forest roads. 29th Annual Meeting of the Council on Forest Engineering, Coeur 'd Alene, ID.
- Park, L.***, R. Manning, J. Marion, S. Lawson and C. Jacobi. Efficacy of visitor management alternatives on the summit of Cadillac Mountain, Acadia National Park. International Symposium on Society and Resource Management, Vancouver, BC, Canada.
- Parrish, P.* and **T. R. Fox**. Impact of coarse fragments on carbon and nutrient pools in forest soils of the Appalachian. Soil Science Society of America Annual Meeting, Indianapolis, IN.
- Predmore, S. A.*** and C. A. Copenheaver. Dendroecological analysis of Grassy Hill Preserve, USA. 7th International Conference on Dendrochronology, Beijing, China.
- Prysby, M. D.** Becoming a naturalist. Virginia 4-H Natural Resources Weekend, Holiday Lake 4-H Educational Center, Appomattox, VA.
- Prysby, M. D.** Citizen science for Master Naturalists. Basic Training Courses for Central Virginia and Rivanna Master Naturalist Chapters; presented in Lynchburg and Albemarle County, VA.
- Prysby, M. D.** Frogs, butterflies, and beyond. Rivanna Conservation Society Public Program Series, Fluvanna County, VA.
- Prysby, M. D.** Introduction to the Virginia Master Naturalist Program. Basic Training Courses for Banshee Reeks, Rivanna, Central Rappahannock Master Naturalist Chapters; presented in Loudoun County, Albemarle County, and Fredericksburg, VA.
- Prysby, M. D.** and J. L. Kirwan. Master naturalists and champion trees. VCE Annual Staff Development Conference, Albemarle County, VA.

- Prysby, M. D.** Master naturalists and monarch butterflies: Become a citizen scientist. Virginia Environmental Education Conference, Smith Mountain Lake, VA.
- Prysby, M. D.** Master naturalists as citizen scientists: Effectively implementing citizen science projects in natural resource outreach and service programs. National Master Naturalist Conference, Flagstaff, AZ.
- Prysby, M. D.** Monarch butterfly biology and conservation. Ivy Creek Foundation Public Program Series, Albemarle County, VA.
- Prysby, M. D.** Monarch butterfly biology and conservation. Monticello Garden Club Meeting, Albemarle County, VA.
- Prysby, M. D.** Overview of the Virginia Master Naturalist Program. Piedmont Master Gardeners Meeting, Albemarle, VA.
- Prysby, M. D.** Overview of the Virginia Master Naturalist Program for parks. Virginia Association for Parks Annual Meeting, Lake Anna State Park, VA.
- Prysby, M. D.** The Virginia Master Naturalist Program. Virginia Chapter of The Wildlife Society, Richmond, VA.
- Prysby, M. D.** Virginia Master Naturalist Program for potential volunteers. Presented eight times in six locations: Albemarle County, James City County, Loudoun County, Washington County, Henry County, and Franklin County, VA.
- Prysby, M. D., J. L. Kirwan and J. R. Seiler.** The Virginia Tech Forestry Outreach Program. Association of Natural Resource Extension Professionals, Park City, UT.
- Radtke, P. J., R. L. Amateis, S. P. Prisley, C. A. Copenheaver and H. E. Burkhart.** Deadwood C production and decay in loblolly pine plantations. Critical Processes and Properties Regulating Carbon Cycling in Southern Forests, Asheville, NC. (Poster)
- Radtke, P. J., G. Trincado and J. Fuller.** Wood properties modeling in loblolly pine. Southern Mensurationists Annual Meeting, Charleston, SC.
- Robertson, D. P.** Commonwealth LandCare initiatives. LandCare Pioneers Retreat, Asheville, NC.
- Robertson, D. P.** LandCare partnership: A holistic approach. Creating Smart Growth with Land Use Management, Gretna, VA.
- Scardina, A. V. and M. J. Mortimer.** Public participation on U.S. national forests. Society of American Foresters 2006 National Convention, Pittsburgh, PA.
- Shaffer, R. M. and B. S. O'Neal*.** Safety training for Hispanic logging workers in the southeastern U.S. 29th Annual Meeting of the Council on Forest Engineering, Coeur 'd Alene, ID.
- Showalter, J. M.*, J. A. Burger and C. E. Zipper.** Growth of three Appalachian hardwood species in different mine spoil types with and without topsoil inoculation. 23rd Annual Meeting of the American Society of Mining and Reclamation, St. Louis, MO.
- Siegel-Issem, C. M.*, J. A. Burger, D. A. Scott, F. Ponder, R. F. Powers and S. C. Patterson.** Forest productivity as a function of root growth in compacted soils. National Workshop on Forest Productivity and Technology: Cooperative Research to Support a Sustainable and Competitive Future, Washington, DC.

- Stern, M. J.** Local responses to global biodiversity conservation: Linking accountability and legitimacy to conservation outcomes. *Perils and Promises of Globalization: Difference, Resistance, and Possibility*; 69th Annual Meeting of the Rural Sociological Society; Louisville, KY.
- Stern, M. J., N. M. Ardoin, R. B. Powell.** Empowerment through evaluation: A participatory and sustainable evaluation approach. *Gathering at the Headwaters, Building EE in Society*, 35th Annual Conference of the National Association for Environmental Education, St. Paul, MN.
- Stokoe, J.** and D. Robertson. LandCare and conservation districts. Southeast Regional Conference of the National Association of Conservation Districts, Asheville, NC.
- Strauss, S. H.,** A. Elias, K. Van Wormer, J. Li, H. Wei, O. Shevchenko, R. Mohamed, S. DiFazio and A. M. Brunner. Genetic containment of forest plantations. *Growing Trees and Stemming Risks Trees: Ecological Ramifications Associate with the Products and Practices of Forest Biotechnology*, Vancouver, BC, Canada. A symposium hosted by the Institute of Forest Biotechnology.
- Strauss, S. H.,** J. Li, H. Wei, O. Shevchenko, R. Mohamed, S. DiFazio, R. Meilan and A. M. Brunner. Genetic containment of poplar plantations. 4th International Poplar Symposium, Nanjing, China.
- Stull, L.***, M. J. Mortimer and S. P. Priskey. Forest-related ordinances in Virginia: A case study in regulatory devolution. Society of American Foresters 2006 National Convention, Pittsburgh, PA. (Poster)
- Sucre, E.*** and T. R. Fox. Influence of soil heterogeneity on nutrient availability in southern Appalachian hardwood forests. Soil Science Society of America Annual Meeting, Indianapolis, IN.
- Sucre, E.*** and T. R. Fox. Use of ground penetrating radar to assess soil heterogeneity. World Congress of Soil Science, Philadelphia, PA.
- Sypert, R.* and **T. R. Fox.** Diagnosis of nutrient deficiencies in loblolly pine using foliar techniques. Soil Science Society of America Annual Meeting, Indianapolis, IN.
- VanderSchaaf, C. L.** and H. E. Burkhart. Using segmented regression to estimate stages of stand development. Southern Mensurationists Meeting, Charleston, SC.
- Visser, R.** Industrial forestry in the mountains of Virginia: A review of harvesting systems and research results. University Seminar Series, Reggio Calabria, Italy.
- Visser, R.** Industrial forestry in Virginia: Learn curve effects, value recovery and system optimization. Invited seminar presentation, University of Florence, Florence, Italy.
- Visser, R.** Swamp logging and Virginia Tech research in Virginia, USA. Meeting of Southern Swiss Foresters, Switzerland.
- Winn, M.,** N. Clark, P. Araman and S. Lee. Coming soon ... A web-based tree crown condition training evaluation tool for urban and community forestry. Southern Regional Conference on Technology Transfer and Extension in Natural Resources, Hot Springs, AR.
- Wiseman, E.** The big bang: Lightning strikes and tree lightning protection systems. 2006 Tree Care Symposium, Richmond, VA.
- Wiseman, E.** Failure risk assessment of leaning trees. 2006 Annual Meeting, Mid-Atlantic Chapter of the International Society of Arboriculture, Virginia Beach, VA.
- Wiseman, E.** The guiding principles of arboriculture. 19th Annual Virginia Cooperative Extension Master Gardener College, Blacksburg, VA.

- Wiseman, E.** Landscape tree inventory: The basis of sound management. 2006 Mid-Atlantic Horticulture Short Course, Virginia Beach, VA.
- Wiseman, E.** Tree hazards: Knowing when to preserve and knowing when to cull. 2006 Mid-Atlantic Horticulture Short Course, Virginia Beach, VA.
- Wiseman, E.** Tree lightning protection systems: Best management practices. 2006 Trees Virginia Workshop, Roanoke, VA.
- Wood, K.*** and S. Lawson. Assessing recreation impacts to cliffs: Integrating visitor observation with trail and recreation site measurements. International Symposium on Society and Resource Management, Vancouver, BC, Canada.
- Wood, K.***, S. Lawson, J. Marion and C. Carr. An integrative approach to managing visitor-caused impacts to cliff resources in Shenandoah National Park. Southeastern Recreation Research Conference, Wilmington, NC.
- Wood, K.*** and J. L. Marion. An integrative approach to managing visitor-caused impacts to cliff resources in Shenandoah National Park. 12th International Symposium on Society and Resource Management, Vancouver, BC, Canada.
- Worrell, W. C.** and W. M. Aust. Demonstration of a stress laminated bridge for a farm road stream crossing. National Association of County Agricultural Agents Annual Meeting and Professional Improvement Conference, Cincinnati, OH.
- Yancey, M.** Benefits of trees. Fall Farm Extravaganza, Lexington, VA.
- Yancey, M.** Chainsaw safety. Family Farm Safety Day, Luray, VA.
- Yancey, M.** Forest site quality. Marl Creek Field Day, Steeles Tavern, VA.
- Yancey, M.** Forestry. Farming 101, Winchester, VA.
- Yancey, M.** Importance of water resources. WVPT Environmental Awards Ceremony, Harrisonburg, VA.
- Yancey, M.** An introduction to forest visualization software. Forest Technology Class, Clifton Forge, VA.
- Yancey, M.** Natural resources overview. Izaak Walton League Meeting, Churchville, VA.
- Yancey, M.** Overview of natural resources. Extension Leadership Council. Presented at 11 locations in Virginia.
- Yancey, M.** Overview of natural resources. VCE NW District Unit Coordinators Meeting, Harrisonburg, VA.
- Yancey, M.** Trees. Wild in the Woods, Grottoes, VA.
- Yancey, M.** Volunteer opportunities. Master Gardener Meeting, Fishersville, VA.
- Zedaker, S. M.** Managing invasive species in the woodlot. 19th New Jersey Woodland Owners Conference, New Brunswick, NJ.
- Zedaker, S. M.** Weed complexes: Their evolution and control. The Root Causes of Plantation Success and Failure – VA/NC – ACF Joint Meeting, Danville, VA.

INTERNATIONAL ACTIVITIES DURING 2006

Gregory Amacher

Began collaboration on a new grant received from the National Science Foundation to study the role of natural resources in mitigating political, environmental, and health shocks among extremely poor households in Mozambique and Uganda, with special focus on protection of the Gorongosa National Park.

Harold Burkhart

Served as Deputy Leader, IUFRO Research Group 4.03 Informatics, Modelling and Statistics.

Susan Day

Worked on finalization of Memorandum of Understanding with Universidad de Costa Rica (UCR), San José, Costa Rica; hosted visiting scholar from UCR; arranged meeting for possible collaborators throughout the VT campus and set up website to facilitate information sharing; helped make contacts for vectored disease group and others.

Thomas Fox

Traveled to Posadas, Argentina, to work with Bosque del Plata on Forest Nutrition Cooperative (FNC) trials and provide advice on forest management issues.

Traveled to Concepcion, Chile, to attend Congreso Chileno de Ciencias Forestales and present invited paper on sustainable forestry. Traveled to Los Angeles to work with the Chilean Forestal Mininco on FNC trials and provide advice on forest management issues; also traveled to Valdivia, Chile, to work with the Universidad Austral de Chile on developing partnership with Virginia Tech.

James Johnson

Traveled to Bolivia twice to conduct strategic planning for the BOLFOR II (Sustainable Forestry in Bolivia) Project and to conduct training for the Bolivian Forest Research Institute

Served on the Planning Committee and as proceedings editor and moderator for the North American Natural Resources Extension Forum held in Mattawa, Ontario, Canada

Traveled to Vienna, Austria, to participate in the IUFRO Board of Directors annual meeting; serves as the Deputy Coordinator for the Policy, Economic, Social, and Information Sciences Division of IUFRO

Jeffrey Marion

Serves on the Advisory Board of the International Centre for Ecotourism Research, Queensland, Australia

Michael Mortimer

Served as the College of Natural Resources' representative in the International Faculty Development Program; visited the Virginia Tech facilities in Riva San Vitale, Switzerland, and made contacts with the forestry program at the Universidad Politecnica de Madrid.

David Robertson

Made presentation on landcare to the Silean Agricultural Research Institute in Arusha, Tanzania
Participated in the Master Landcare Course, Study Tour, and 2006 International Landcare
Conference in Melbourne, Australia
Developed a year-long cultural exchange and study abroad program and taught an
undergraduate course as part of the International Honors Program in England and
Tanzania

Robert Shaffer

Participated in a nine-day Forest Resources Association's Forest Operations Field Tour in Chile.

Rien Visser

Sabbatical beginning October, 2006; based in Sesto Fiorentino, Tuscany, Italy, with the IVALSA
(Trees and Timber Institute) group from the federal Consiglio Nazionale delle Ricerche. Assisted
with research program development and completed time studies on various biomass
harvesting/chipping operations.

William Worrell

Assisted with a South America Reverse Trade Mission trip, in which wine makers from South
America spent a week touring parts of Kentucky and Virginia; organized a meeting of the wine
makers (who are interested in buying white oak from Virginia to produce wine barrels) with local
and regional forest industries representatives; gave a presentation on sustainable forestry,
including forest management and logging practices

Shepard Zedaker

Continued to serve as coordinator for undergraduate student exchange programs with the
University of Melbourne, Australia (since 1990), the University of Canterbury, New Zealand (since
1996), and the University of Stellenbosch, South Africa (since 1997).

2006 PUBLICATIONS

Refereed Journal Articles

- Albaugh, T. J., H. L. Allen and T. R. Fox. 2006. Individual tree crown and stand development in *Pinus taeda* under different fertilizer and irrigation regimes. *For. Ecol. Manage.* 234:10-23
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- Copenheaver, C. A., E. A. Pokorski, J. E. Currie and M. D. Abrams. 2006. Causation of false ring formation in *Pinus banksiana*: A comparison of age, canopy class, climate and growth rate. *For. Ecol. Manage.* 236:348-355.

- Daniels, M. L. and J. L. Marion. 2006. Communicating Leave No Trace ethics and practices: Efficacy of two-day trainer courses. *J. Park & Rec. Admin.* 23:1-19.
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Other Publications

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