College of Natural Resources and Environment

Research Centers and Cooperatives

January 2014

Leading transformational research to develop sustainable solutions to complex environmental issues
Center for Environmental Applications of Remote Sensing
cears.cnre.vt.edu

The mission of the Center for Environmental Applications of Remote Sensing (CEARS) is to provide interdisciplinary leadership in remote sensing through formal instruction, outreach, cooperative research, and consulting. CEARS contributes to applications of the science and technology necessary to better understand effects of both natural and human-induced variability and change within the Earth’s systems. CEARS focuses on three pressing priorities: (1) to further understanding of the Earth’s major biogeochemical cycles, (2) to improve understanding of the factors affecting biological diversity and ecosystem structure and functioning, and (3) to develop a systematic understanding of changes in land uses and land cover that are critical to ecosystem functioning and services, and human welfare.

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Center for Forest Products Business: Alfred P. Sloan Foundation Affiliate
cfpop.vt.edu

The Center for Forest Products Business was established to help forest products firms improve the management of their operations and the marketing of their products. The center’s mission is accomplished through educating business professionals for employment in the forest products industry, providing useful market research, and offering continuing education for forest products industry professionals. The center’s research and education efforts focus on understanding the consumers of forest products and how effectively forest industries are able to provide for their needs. Cooperators include faculty members and students within the College of Natural Resources and Environment and the Pamplin College of Business, forest industry partners, trade associations, and USDA Forest Service scientists from the Northern and Southern research stations. The center is part of the Alfred P. Sloan Foundation’s Industry Studies Program to conduct scholarly research that benefits from deep industry knowledge and engagement with industry practitioners.

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Center for Leadership in Global Sustainability
cligs.vt.edu
The Center for Leadership in Global Sustainability (CLiGS) provides education, research, and leadership needed to navigate a rapidly changing world in order to contribute to a sustainable future. Bringing together faculty and students from Virginia Tech with partners from other educational, nongovernmental, corporate, and government institutions, CLiGS is dedicated to exploring and facilitating interdisciplinary and collaborative approaches to sustainable development strategies in globally interconnected ecological, economic, and social environments. The Master of Natural Resources is offered through CLiGS in three formats: online, executive, and global—as well as two graduate certificates (natural resources and global sustainability), and continuing education programming.

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Center for Natural Resources Assessment and Decision Support
cenrads.cnre.vt.edu
The Center for Natural Resources Assessment and Decision Support conducts the translational research needed to develop and apply the next generation of analytical tools and data to assess the status and trends of renewable natural resources. We engage stakeholders in industry, government, and citizen organizations in answering crucial questions about the sustainability of natural resources use. We involve undergraduate and graduate students in conducting, applying, and communicating research, thereby preparing the next generation of resource managers, decision makers, and leaders. Although the short-term focus is on forest resource assessments, the center will have a broader scope and will deliberately expand its array of stakeholders, partners, and research activities to represent the wider range of natural resources, including water, biodiversity, and wildlife habitat, and will address issues that extend geographically well beyond the Commonwealth of Virginia.

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Center for Packaging and Unit Load Design
unitload.vt.edu
The Center for Packaging and Unit Load Design is the only research facility in the United States that performs comprehensive research and development work, provides technical assistance, and offers educational programs focusing exclusively on the interactions of packaging, pallets, and material handling equipment. Research at the center provides information and technologies that optimize the relationship between the design and the performance of unit load material handling systems, which helps reduce company costs and environmental impact while increasing the safety of the nation's transport system. The center provides a wide range of evaluations to assist companies in the development of new, more efficient pallet, packaging, and equipment designs, and performs customized and standard tests, including those specified by the American Society of Testing Materials, American National Standards Institute, International Organization of Standards, and International Safe Transit Association, as well as government agencies.

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Conservation Management Institute
cmi.vt.edu
The Conservation Management Institute (CMI) provides innovative solutions to multidisciplinary research questions that affect natural resource conservation in Virginia, North America, and the world. Our core belief is that effective natural resource management must be grounded in sound science. The CMI engages with agencies and organizations to solve problems effectively and efficiently. CMI activities include information management, spatial information technology services, field ecological work, professional development course design and delivery, and project coordination. The CMI actively involves undergraduates in projects to provide opportunities for them to gain experience while completing their course of study.

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**Forest Operations and Business Research Cooperative**

In 1973, the Virginia Tech Industrial Forest Operations program was initiated as a cooperative effort among the pulp and paper industry, forest equipment manufacturers, and Virginia Tech to provide undergraduate and graduate education programs. These programs were designed to prepare foresters for careers in wood procurement, working with independent contractors, and overseeing the operational aspects of forest industries. To create opportunities for graduate students, research became a larger focus in 1984 when faculty members and students began regularly cooperating with forest industry and equipment manufacturing personnel in the selection of research focus areas and projects. The program has since evolved with a name change to Forest Operations and Business to better reflect students’ and employers’ needs in a changing forest industry. Based in the Department of Forest Resources and Environmental Conservation, the Forest Operations and Business Research Cooperative taps a broad range of university and industry resources to provide students with educational and research opportunities that address forest industry needs. The cooperative works in four major research areas related to forest management activities:

1. Evaluating operations with regard to safety, productivity, planning, and logistics
2. Creating tools to improve the efficiency and profitability of forest operations
3. Analyzing forest business issues such as supply chain management and biomass utilization
4. Evaluating the environmental impacts of forest operations

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**Forest Modeling Research Cooperative**

The Forest Modeling Research Cooperative is an outgrowth of the Loblolly Pine Growth and Yield Research Cooperative that was founded at Virginia Tech in 1979 for the purpose of developing growth and yield models for intensively managed loblolly pine plantations. The current name reflects a broad interest in and an expanded scope of modeling work that includes diverse species, regions, and production objectives. Although loblolly pine remains a primary research thrust, the cooperative is addressing an expanded array of growth and yield modeling projects in both the United States and South America.

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Harold Burkhart  
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The Freshwater Mollusk Conservation Center is a cooperative research and propagation facility to restore and recover endangered freshwater mollusks in Virginia and adjacent states. The unit began life history research on a suite of listed endangered mussels. Numerous graduate student theses and dissertations over a roughly 20-year period provided the knowledge and expertise to implement a propagation program. In 1997, the first propagated juveniles of a federally endangered species were released to augment reproduction in that population. In 2000, a grant from the National Fish and Wildlife Foundation and matching funds from other agencies enabled the center to construct a 2,700-foot building and pond complex to enhance its conservation work. Over the last 10 years, the annual production of juveniles has gradually increased, such that roughly 10,000-20,000 juveniles of 8-10 species are typically produced for release each year.

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Reynolds Homestead Forest Resources Research Center

arec.vaes.vt.edu/reynolds-homestead

The Reynolds Homestead Forest Resources Research Center in Critz, Va., was created in 1969 to study forest biology, including genetics, physiology, and soils. Specific projects include harvesting to increase forest health and productivity, site preparation, forest fertilization, loblolly pine physiology, and forest herbicide testing. Facilities include 780 acres, a two-acre pond, house, apartment, lab and office space, greenhouse, coolers, two tractor sheds, and an additional seven acres dedicated to the continuing education center and the Reynolds family museum house and cemetery.

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National Science Foundation Center for Advanced Forestry Systems
cnr.ncsu.edu/fer/cafs

The Center for Advanced Forestry Systems (CAFS) is a National Science Foundation Industry/University Cooperative Research Center that bridges top forestry research programs with industry members to solve complex, industry-wide problems. The mission of CAFS is to optimize genetic and cultural systems to produce high-quality raw forest materials for new and existing products by conducting collaborative research that transcends species, regions, and disciplinary boundaries. CAFS is a multi-university center that works to solve problems through multifaceted approaches and questions on multiple scales, including molecular, cellular, individual-tree, stand, and ecosystem levels. This effort relies on the participation of scientists with expertise in biological sciences (biotechnology, genomics, ecology, physiology, and soils) and management and processing (silviculture, bioinformatics, modeling, remote sensing, and spatial analysis).

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USDA Forest Service, Southern Research Station, Center for Aquatic Technology Transfer
srs.fs.usda.gov/catt
The Center for Aquatic Technology Transfer has been working with resource managers in the USDA Forest Service’s Southern and Eastern regions and researchers from the Southern Research Station since 1995 to provide innovative solutions to aquatic resource management challenges on national forests. The center offers a broad range of services to national forests in the Southern and Eastern regions, ranging from logistical support to full project planning, implementation, reporting, and follow-up.

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USDA Forest Service, Southern Research Station, Forest Watershed Science Research Work Unit
srs.fs.usda.gov/cfwr
The mission of the Forest Watershed Science Research Work Unit is to provide information, methods, and guidelines to implement and evaluate ecosystem management concepts, practices, and effects on water, soil, and forest resources. The Blacksburg team seeks to acquire new knowledge about factors that influence the distribution, abundance, and production of trout and other coldwater fish in the southern Appalachians and to provide the technical basis for protecting, enhancing, and restoring coldwater streams and their faunas. Current research focuses on impacts of climate change on streams habitats, habitat fragmentation by barriers to movement of aquatic organisms, riparian management, and the ecology of large wood streams.

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**USDA Forest Service, Southern Research Station, Utilization of Southern Forest Resources Research Work Unit**

`srs.fs.usda.gov/usfr`

The mission of the Utilization of Southern Forest Resources Research Work Unit is to define and apply chemistry, materials science, forest management, and engineering principles to the characterization and utilization of southern forest resources for maximum societal benefits with minimal environmental consequences. The Blacksburg team is currently focusing on research in the areas of green building, pallet repair and recycling, and urban tree monitoring.

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**USDA National Agroforestry Center**

[nac.unl.edu](http://nac.unl.edu)

The USDA National Agroforestry Center is a partnership among the USDA Forest Service Research and State and Private Forestry units, and the Natural Resources Conservation Service. The center accelerates the application of agroforestry through a network of partners who conduct research, develop technologies and tools, and coordinate demonstrations and training of natural resource professionals. The Blacksburg unit of the center is focused on forest farming with non-timber forest products, particularly integrating medicinal and edible forest products under trees. Current efforts include sustainable harvest and management of ramps, an edible forest product that is embedded in Appalachian culture. Long-term research of black cohosh, a native medicinal plant, with volunteer citizen scientists is leading to recommendations on improved management of this important forest product. The Forest Farming Network is working with private forest landowners to examine the potential of growing native medicinal plants under natural tree cover.

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USGS Patuxent Wildlife Research Center

www.pwrc.usgs.gov

The Patuxent Wildlife Research Center operates a Park Studies Unit at Virginia Tech to conduct research and technical assistance to national parks and other protected natural areas nationwide. Research is focused on recreation resources management, recreation ecology (visitor impacts to protected environments), carrying capacity, and nature-based tourism.

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Virginia Cooperative Fish and Wildlife Research Unit

coopunits.org/Virginia

The Cooperative Research Unit program was established in 1935 to enhance graduate education in fisheries and wildlife sciences and to facilitate research between natural resource agencies and universities on topics of mutual concern. The Virginia Cooperative Fish and Wildlife Research Unit is a partnership among the U.S. Geological Survey, the Virginia Department of Game and Inland Fisheries, Virginia Tech, and the U.S. Fish and Wildlife Service. Staffed by federal personnel, the unit conducts research on renewable natural resource questions, participates in the education of graduate students, provides technical assistance and consultation on natural resource issues, and provides continuing education for natural resource professionals.

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Virginia Water Resources Research Center  
vwrrc.vt.edu  
The Virginia Water Resources Research Center (VWRRC) was established at Virginia Tech in 1965 under the federal Water Resources Research Act of 1964 and designated as a state agency in 1982 by the Virginia General Assembly under the Code of Virginia (§23-135.7:8). The code explains that the VWRRC exists “for the purposes of developing, implementing, and coordinating water and related land research programs in the commonwealth and transferring the results of research and new technology to potential users.” All colleges and universities in the commonwealth are served by the VWRRC. The center has a long-standing tradition of providing research and educational opportunities to future water scientists, promoting research on practical solutions to water resources problems, and facilitating timely transfer of water science information to policymakers, decision makers, and the general public.

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Wood-Based Composites Center  
wbc.vt.edu  
The Wood-Based Composites Center is a National Science Foundation Industry/University Cooperative Research Center housed in the Department of Sustainable Biomaterials at Virginia Tech. The center, established with industry funding in 1999, focuses on fundamental research and education for the purpose of advancing the science and technology of wood-based composite materials. Industrial members interact on a regular basis with students and faculty from the center’s academic partners: Oregon State University, the University of Maine, the University of British Columbia, and Virginia Tech.

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