VirginiaTech
Invent the Future

FALL 2007

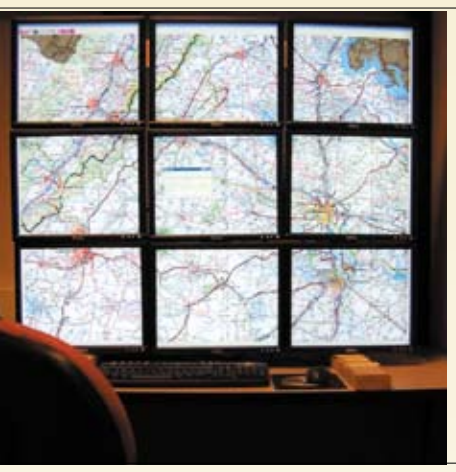
CNR NEWS

Carstensen

A Leading Research Collaborator at Virginia Tech

COLLEGE OF NATURAL RESOURCES
Virginia Polytechnic Institute and State University

Bill Carstensen, department head of geography, is making such a mark with geospatial technology that Virginia Tech's Office of the Vice President for Research lists him as a leading research collaborator. Carstensen is currently involved in four wide-ranging collaborative research efforts, including projects on ultra-high resolution interactive information visualization, the Joint Unmanned Systems Experimentation and Research (JOUSTER) Site, the DARPA Grand Challenge, and spatial uncertainty models to automate and enhance data fusion.



Carstensen and graduate student Candice Leubbering are testing whether larger screen sizes, like this nine-monitor workstation, may improve imagery analysts' ability to interpret spatial data.

Carstensen's project on ultra-high resolution interactive information visualization with the Center for Human Computer Interaction in collaboration with the computer science department is assisting imagery analysts at the National Geospatial-Intelligence Agency (NGA) who are interested in larger screen sizes that may enhance an analyst's ability to interpret spatial data. In the visualization study, he and graduate student Candice Leubbering are studying and quantifying the advantage given to users of large format high resolution computer monitors in interpreting and analyzing map and imagery data. Subjects using one, four and nine-monitor designs are being tested for their map use skills.

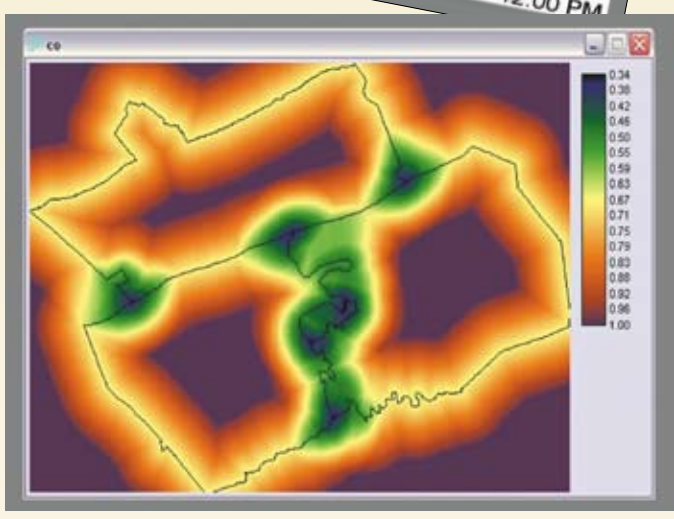
In his project to develop the Joint Unmanned Systems Experimentation and Research (JOUSTER) Site in collaboration with the mechanical engineering department, Carstensen and M.S. student Om Poudel are looking at the use of Light Detection and Ranging (LIDAR) data to navigate autonomous ground vehicles across open terrain and avoid barrier areas. LIDAR is an aerial remote sensing system that collects topographical data. The ground vehicles in the project operate under GPS control and drive between latitude and longitude coordinates, or waypoints. Carstensen said, "The issue is what path to attempt from waypoint to waypoint. While straight lines are the shortest paths, intervening obstacles make straight lines poor choices in most terrains. Applying raster GIS accumulated surface algorithms, vehicles can avoid obstacles such as buildings and trees, and pass over flatter slopes between waypoints."

For the DARPA Grand Challenge project, in collaboration with the mechanical engineering department, Carstensen and graduate student Aaron Dalton examine the significant issue of predicting GPS coverage in urban canyons. Urban canyons are areas where GPS coverage can become obstructed by buildings and foliage. The DARPA Grand Challenge is a competition that tests the ability of autonomous vehicles to function in an urban environment. The vehicle interacts in an environment with other moving objects and needs to obey traffic rules such as stopping at stop signs and avoiding collisions, making navigation more difficult than that in open terrain. Urban canyon work was done by former graduate student Matt Germroth and is being continued for this project.

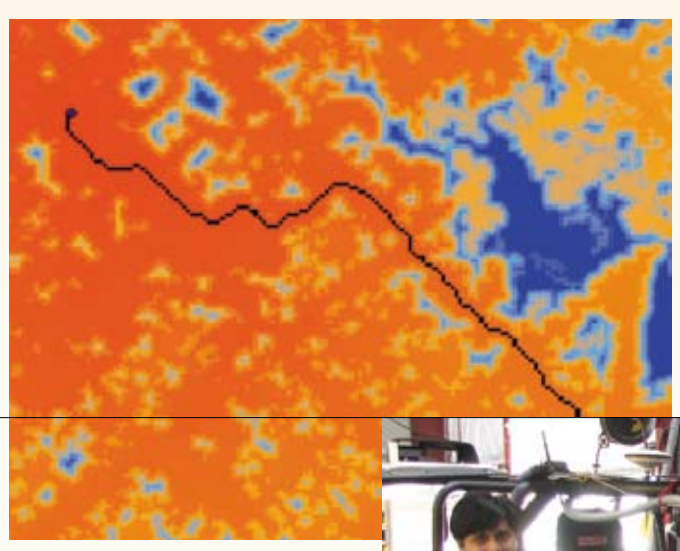
Carstensen's fourth project, the application of spatial uncertainty models to automate and enhance data fusion, in collaboration with Steve Prisley of the forestry department, and Keying Ye and Eric P. Smith of the statistics department, develops tools to apply uncertainty principles to ArcGIS. These tools will allow analysts at the NGA to make better judgments when combining data layers together. Carstensen and graduate student Andrew Foy examined edge effects on polygons when the precision of the lines that bound them is not 100 percent. Carstensen said, "If we apply a Bayesian or other statistical model to the polygons, we can provide an analyst with a probability that a point is in a particular polygon."

Geospatial technology is particularly useful in a wide range of studies, and Carstensen's expertise in spatial modeling makes him a sought out candidate for collaborative research. Most of his research in the past 10-15 years has been in collaboration with others in the college and across the university.

Shadows on the map of the Virginia Tech central campus represent areas hidden from GPS coverage by the buildings at noon on April 28, 2005. Darker areas have far lower GPS accuracy than open whiter areas.



The values on the map above indicate degrees of certainty as to the polygon in which a point falls.



The dark purple indicates certainty, while the yellow is about 50 percent certain, and the green and dark blue represents increasing uncertainty.

The black line shown in the LIDAR data depicts a route in the terrain that follows flatter slope that the JOUSTER vehicle will have less trouble with.

Carstensen and graduate student Om Poudel pose with Rocky, the JOUSTER vehicle.

FROM THE DEAN'S PERSPECTIVE

Autumn has arrived here in Blacksburg. As we enjoy this most beautiful of seasons in Southwest Virginia, we continue to recover from the tragedy of April 16. We are renewed by the energy, excitement, and flurry of activity that comes with the arrival of the cool crisp days of Indian Summer.

An essential step in our recovery as a university is to pick up again those things that were set aside after April 16. An important part of this process was the October 20 kickoff of the Campaign for Virginia Tech. This campaign is designed to give the university the financial support necessary to truly "invent the future" and move to the top ranks of research universities in the U.S. Within the Campaign for Virginia Tech, the College of Natural Resources has set financial goals that will enable us to move forward in pursuit of our vision for the future.

That vision for the college is to be an innovative national/international leader in natural resource education and science, discovering and sharing the answers to sustainable management of resources for both current and future generations. In order to do that, we must produce well-trained professionals capable of optimally balancing conservation, management, and use of resources in a century of unprecedented ecological, political, and economic challenges.

Discoveries in the college are already making a difference to our world, and we intend to increase our presence in the international research community. This commitment to research will have positive impacts on many fronts. First, it will allow us to increase and diversify our faculty ranks, as well as increase our ability to attract exceptional faculty members to our college. Second, new research programs will strengthen our teaching and outreach, creating more opportunities for both undergraduate and graduate students to participate in basic and applied research.

Already nationally recognized in the areas of forestry, forest products, fisheries and wildlife sciences, and geography, our programs address the social and human elements of resource management and instill in students a sense of stewardship and land-use ethics. Our campaign goals include increased funding for graduate fellowships, undergraduate support, international study for both graduate and undergraduates, and research equipment. Capital projects include laboratories and research facilities for Fisheries and Wildlife Science, Wood Science and Forest Products, and Forestry, as well as enhancements to existing facilities.

Our goal of $9.1 million is a small part of the overall university campaign goal, but when accomplished, that new funding will have an enormous impact on this college. With your help and our commitment, the College of Natural Resources will continue to grow and expand our contributions to the commonwealth and the world.

Dean Mike Kelly thanked College of Natural Resources' sponsors at Homecoming 2007. L-R are: Donald Bright of Morgan Lumber, Harrell Turner of CHT Forestry, and Dean Kelly. For full story on Homecoming and future alumni events, turn to page (<bold>

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Trauger Facilitates $223,000 Korean Gift

David Trauger (second from left at table) represented Virginia Tech at the Rotary Club meeting in Washington, D.C., where the Korean churches gave a $223,030 check to the university.

David Trauger, dean of the National Capital Region who built up the college's natural resources program in Northern Virginia, accepted a check for $223,000 at a June Rotary Club meeting in Washington, D.C. Deuk Youn presented the contribution to assist the families hurt by the tragedy at Virginia Tech. In thanking the group for its kind donation on behalf of Virginia Tech, Trauger said, "I know I speak for everyone at the university when I say we are truly humbled by your extraordinary generosity and support. There are no words to adequately express our sincere gratitude and appreciation." After the meeting, Trauger received a certificate indicating that the Rotary Club will plant cherry trees at the Tidal Basin in remembrance of those who died on April 16.

IN MEMORIAM

Barrett Anthony (Barry) Garrison

Forty-nine-year-old Barry Garrison, recipient of an M.S. in wildlife biology from Virginia Tech in 1986, passed away on June 8.

Born in Ventura, Ca., Garrison received a B.S. from Humboldt State University before coming to Virginia Tech to earn his M.S. His career included working as a wildlife biologist for the U.S. Fish and Wildlife Service, California Department of Forestry and Fire Protection, and the California Department of Fish and Game.

Garrison worked to protect and research fish and wildlife resources throughout the state of California. He was also an active member of the western section of the Wildlife Society.

NEWS NEWS, SEND US YOUR NEWS Please let us know what is happening in your life so we can include the news in our next college newsmagazine. Send your information to Shirley Paine at shirl07@vt.edu; or 324 Cheatham Hall, Blacksburg VA 24061. Thanks. We would love to hear from you. Send it NOW while you are thinking of it!

University Partners With SA-CESU

"With a signing of an agreement, Virginia Tech now partners with the Southern Appalachian Cooperative Ecosystem Studies Unit (SA-CESU)," announced forestry department head Harold Burkhart.

SA-CESU is a network of federal agencies, universities, research associations, state agencies, and Indian tribes that share several science-based goals: high quality science, usable knowledge for resource managers, responsive technical assistance, continuing education, and cost-effective research programs. The Southern Appalachian Unit represents one of the seventeen units and is based at the University of Tennessee-Knoxville.

The scope of the SA-CESU includes biological, physical, cultural, and social sciences. Its priority theme areas include ecological and habitat health, restoration of ecosystems, invasive species, and urban-wildland interface issues.

"Being a partner in the SA-CESU is helpful to the Virginia Tech research and teaching community because it provides an efficient mechanism for promulgating cooperative agreements between CESU partners and university faculty," explained Burkhart. The agreement permits funds to flow from all federal partners to work on research projects anywhere in the country. However, the primary emphasis of the SA-CESU is on issues, problems, and projects in the Southern Appalachians.

National Capital Region Natural Resources Program On A Roll

Natural resources program director David Trauger, who has built up a dynamic program in a short period of time at the Northern Virginia center in Falls Church, Va., has astounding past accomplishments and more multi-faceted activities planned for the semester.

Twenty-one faculty and staff are now affiliated with the program. Faculty assisting in the recent landmark planning session include wood science and forest products professor Tom Hammett; Robert Slusser, Potomac Watershed field coordinator with the Virginia Department of Conservation and Recreation; and John Gray, hydrologist with the U.S. Geological Survey, who will teach a water resources course next year.

The Natural Resource Program is designed to prepare mid-career natural resource professionals and individuals interested in career changes for influential roles in natural resource management and conservation. Currently, more than 125 students are enrolled in graduate courses. Trauger's astute leadership was recognized in February when he was appointed interim associate dean in the Graduate School for the National Capital Region.

Some of the Capital Region faculty attending the natural resource planning meeting were, (L-R), Neil Sampson, Slusser, Steve Sheffield, Brian Czech, Hammett (seated), Mansi Grover, Trauger, Shelley Mastran, David Robertson, Gary Evans (seated), Patrick Michaels, Robert Leopold, Lauren Giese, and John Hadidian.

Recirculating Aquaculture Conference Accepting Symposium Requests And Abstracts

Virginia Tech and The Aquaculture Engineering Society (AES) are sponsoring the Seventh International Conference on Recirculating Aquaculture at the Hotel Roanoke and Conference Center, July 25 – 27, 2008, in Roanoke, Va. If you are interested in organizing a symposium, email the title, a list of potential speakers with title of talks, and no more than one page explaining what the symposium would cover before Nov. 9, 2007, to *aqua@vt.edu*.

A call for technical papers to be submitted to the editors has also been issued. Authors must submit a short abstract no later than Feb. 1, 2008 at the email listed below.

Abstract Guidelines

1. *Abstracts should be concise, between 250-500 words.*
2. *Use single spacing, 12 pt. font, and one inch left and right margins.*
3. *Titles should also be concise, but clearly relate the subject of the article.*
4. *Include the names, affiliations, and addresses of the authors.*
5. *Paste the abstract into the body of the e-mail message; do not send as an attachment. Please ensure that your file is virus-free.*

If your abstract is accepted, your revised abstract and paper will be due by April 15, 2008. Send abstracts to Terry T. Rakestraw, *aqua@vt.edu*. For more information call (540) 231-6805.

Carp Tagged By Fisheries Students

A group of fisheries and wildlife students has played a crucial role in a study funded by the U.S. Army Corps of Engineers. Some 7,680 sterile grass carp were brought from Arkansas to Lake Gaston, which lies along the Virginia-North Carolina border. Half of the fish were deposited in the lake near Bracey, Va., and the other half were inserted at the N.C. Wildlife Resources Commission access.

The carp are a part of the 2007 weed treatment plan for the lake and were ordered by the Lake Gaston Weed Control Council. A team of Virginia Tech fisheries students measured and weighed a sample of the carp to ensure that they were healthy.

The students also surgically implanted 30 carp with radio tags. The tags will allow the U.S. Army Corps of Engineers to determine movement patterns of the fish and their mortality rate.

Graduate students Nick Lapointe and Mike Duncan performed the surgery by inserting the tags through incisions in the fish's stomachs and then stitching the incisions together. Duncan will return to Lake Gaston about once per month to track the fish and record their positions using GPS.

The Virginia Tech team also consisted of Mark Foster, technician Ryan Saylor, Michelle Davis, a research associate and fisheries and wildlife science graduate, and Ben Eberline.

Nick Lapointe and Mike Duncan performing the radio tag surgery on the carp.

New Professorships Announced

The Virginia Tech Board of Visitors has named three professors in the College of Natural Resources to new professorships.

Greg Amacher

Gregory S. Amacher, professor of forestry, has been named the Julian N. Cheatham Professor of Forestry. A member of the Virginia Tech faculty for 12 years, he has become a national and international expert in forest policy analysis. He has written over 100 publications and received more than $5 million in research grants.

Jim Burger

James A. Burger, professor of forestry, has been named the Garland Gray Professor of Forestry. Burger has been a member of the Virginia Tech faculty for 27 years. He has established himself as the authority on reforestation and restoration. His research work in the area of reclamation of disturbed land has had a profound impact in his field.

Chip Frazier

Charles E. "Chip" Frazier, professor of wood science and forest products, has been named the Thomas M. Brooks professor of Wood Science and Forest Products. Frazier has been a member of the Virginia Tech faculty for 14 years. He has been an active member of the university-wide Center for Adhesive and Sealant Science, as well as the college, and is one of the founding members of the university based Macromolecules and Interfaces Institute.

Kirwan Receives Jefferson Award

Yet another professor in the college has established himself as a leader in his field. Jeffrey Kirwan, Extension specialist and forestry professor for 4-H and Youth Forestry, recently received the Thomas Jefferson Medal for Outstanding Contributions to Natural Science Education from the Virginia Museum of Natural History. The award recognizes a Virginia educator who has consistently made excellent contributions to natural history, environmental, and science education.

"Natural history and natural science education are critically important to our society," stated Kirwan. "Children need to know, for instance, that there once was a great tree called the American chestnut, and that the Chesapeake Bay, which is Algonquian for "great shellfish bay," is no longer great. Children need to know that the world they are inheriting could and should be better."

Kirwan delivering a speech at the Jefferson Awards.

Helfrich Honored With Emeritus Status

Louis Helfrich

Louis Helfrich, retiring professor of fisheries and wildlife science, has been made "professor emeritus" by the Virginia Tech Board of Visitors.

The title of emeritus may be conferred on retired professors and associate professors, administrative officers, librarians, and exceptional staff members who have given exemplary service to the university and who are recommended to the Board of Visitors by Virginia Tech President Charles W. Steger. Nominated individuals who are approved by the Board of Visitors receive an emeritus certificate from the university.

A member of the Virginia Tech community since 1976, Helfrich had served for a while as interim head of the Department of Fisheries and Wildlife Sciences. He provided leadership and technical advice to enhance the economic feasibility, profitability, and competitiveness of the Virginia aquaculture industry.

Helfrich made several significant contributions in research in natural resources, writing 54 peer-reviewed journal articles, 16 reports on research, two books, three book reviews, 45 Virginia Cooperative Extension publications, 18 popular articles, and five educational videos. He was well known for the outstanding fisheries posters he produced for educational and conservation purposes.

He served on numerous university, state, national, and internal societies and committees, including consultant and technical advisor with U.S. AID/AED for the government of Sri Lanka.

Helfrich received the Carnegie Mellon Film Institute Video Selection Award in 2000 and the Outdoor Writers Association of America Broadcast Video Award in 1999. He was named Fellow of the American Institute of Fisheries Research Biology in 1983, as well as received three Education Publication Merit award, the American Fisheries Society Best Research Paper and Presentation award, and the U.S. Fish and Wildlife Service Certificate of Recognition.

He received his bachelor's degree at Clarion University, a master's degree from Pennsylvania State University, and a master's degree and Ph.D. from Michigan State University.

Virginia Tech Professor Writes Forest Report

Professor Mila Alvarez, author of SAF's comprehensive tree report.

The Society of American Foresters (SAF) has published a report that aims to answer questions from all comers regarding information about forests around the country. Mila Alvarez, a professor at Virginia Tech's National Capitol Region Campus in the College of Natural Resources, authored the report. The 68-page report cites over 50 sources, including the U.S. Department of Agriculture Forest Service and the U.S. Department of Interior Fish and Wildlife Service.

According to the report, the Russian Federation is the most forest-rich nation in the world. Brazil and Canada rank second and third, and the United States places fourth, containing eight percent of the world's primary forest. The report goes on to say that the number of acres of forestland in America has barely changed over the past century. Approximately 25 percent of private forestland is protected by the stainable Forestry Initiative, the Forest Stewardship Council, or the American Tree Farm System. Of the total amount of forest, 20 percent in protected by some sort of conservation program. This compares favorably with the world average of 11 percent.

In addition to being a professor at Virginia Tech, Alvarez is the principal of Solutions for Nature, a natural resources management consulting firm.

Local Research Center And School Team Up To Help Environment

Fenced out riparian area where some of the project's ground truthing took place.

Christy Gabbard and Jessica Dorr of the Conservation Management Institute (CMI) teamed up with two students from Roanoke Valley Governor School (RVGS) to map riparian buffers for the Catawba Valley LandCare effort.

Gabbard said the idea for the project was conceived when Jeff Waldon, the director of CMI, attended the Virginia Geographic Information Systems conference in Roanoke and met Fred Hoffman, a physics teacher at RVGS. The two discussed ways for CMI and RVGS to work together and came up with the project idea.

The project began in the fall of 2006 and was recently completed in the spring of 2007. The project consisted of two RVGS seniors, Travis Charlton and Stacy Hollins, using aerial photographs of Catawba Creek Valley and North Fork Valley, provided by CMI, to delineate and classify streams and determine areas of stream bank erosion. The team also conducted a few days worth of ground truthing (on-site information collection) on several private properties to determine the level of stream bank erosion. Part of the study area included the farm at the north end of the Catawba owned by Virginia Tech and used by the college for research. "The project connects landowners, students, and the university," Gabbard said. "That's a partnership that can be effective."

Also involved with the project is Catawba Valley LandCare, which according to Gabbard, is a "grassroots community-based organization that strives to provide education and outreach to the community to achieve a healthy environment in these watersheds." Gabbard added that Catawba Valley LandCare also promotes open space by encouraging the development of viable agriculture and value-added markets across their county boundaries. Catawba Valley LandCare receives facilitation and coordination services from the CMI and the LandCare Center of Virginia Tech. Gabbard described the project when she said, "Catawba Valley LandCare worked in partnership with the Roanoke Valley Governor's School to classify stream segments based on vegetative cover and evident stream bank erosion."

The effects of the project are ongoing. Charlton wrote an abstract of the project, submitted an application, and was accepted to display a poster about the project at the Virginia Tech Office of Geographic Information Systems (OGIS) symposium, based on the abstract. The ultimate goal of the project is to produce a summary report and distribute it to the landowners to inform them of the level of their water quality. "The project is aimed at targeting land owners with lots of stream bank erosion and offering them programs for stream restoration," Gabbard said. "These stream bank classification data were paired with the corresponding landowner parcel data in a geographic information system. These data are used to help organize a community effort towards the improvement of these waterways and to identify landowners that may benefit from available cost share programs."

Catawba and North Fork were picked for the project due to their status as headwaters for two different river basins, the James River and the Roanoke River, respectively, and their status as water sources for two separate reservoirs, Carvins Cove and Spring Hollow, used by the city and valley of Roanoke.

Gabbard and Dorr paired up due in part to Gabbard's involvement with the Catawba Valley LandCare and Dorr's GIS and school-volunteer background. "It worked out really well," Dorr said. "We received good data and had a good experience working with the students."

Replenishing The Tennessee River

Virginia Tech once again set an example for the rest of the country to follow. The U.S. Fish and Wildlife Service recently announced that they would be giving grants to many states for the preservation of endangered fish and wildlife. The grants are intended to provide annual funding to all fish and wildlife agencies that have established conservation plans. While making the announcement, Interior Secretary Dirk Kempthorne pointed out the work being done by Virginia Tech and other groups to conserve mussels in the upper Tennessee River Basin.

Dick Neves, CNR fisheries professor, is one of the world's leading mussel researchers.

Part of Virginia's plan states that Virginia Tech, the Virginia Department of Game and Inland Fisheries, The Nature Conservancy, and the Upper Tennessee River Roundtable partnership will work with private landowners to restore freshwater mussels in the Tennessee River. There are few species of wildlife anywhere in North America that are more endangered than freshwater mussels, and without the aid of grants and several institutions, they could become extinct with other species following in their wake.

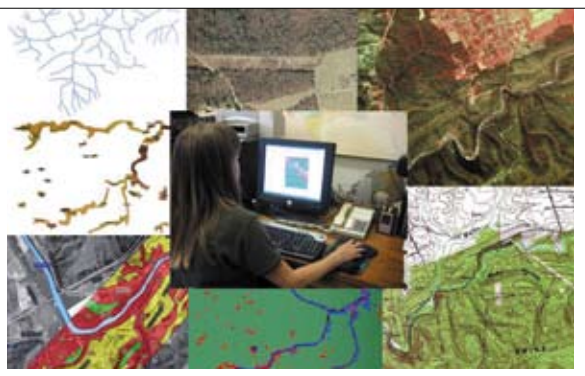
CMI Assists With Wetland Inventory

The Conservation Management Institute (CMI), in collaboration with John Galbraith in Virginia Tech's Department of Crop, Soil, and Environmental Science, is working with the National Wetlands Inventory (NWI) Program of the U.S. Fish and Wildlife Service to update wetlands maps in New York and Virginia. The spatially updated maps will show attributes indicating the ecological function of these critically important lands. Over the next few years, CMI hopes to expand this effort to include parts of the Southeast and Northeast regions of the United States.

With this update, CMI will provide NWI with new wetland maps with improved accuracy, which is important for both land managers in choosing areas to receive habitat protection environmental researchers conducting geospatial analysis.

Staff members at CMI are using Feature Analyst, a software package by Overwatch Systems, that uses computer algorithms to identify and distinguish between vegetated wetlands and bodies of water.

This technique has increased spatial accuracy as well as dramatically reduced processing time. The results are also less subjective and show more detail than more commonly used manual methods.



CMI was established in 2000 with faculty from the Virginia Tech College of Natural Resources as well as other research institutions in order to address multidisciplinary research questions affecting conservation management effectiveness. CMI works with businesses, management agencies and organizations throughout the world to support conservation. The institute assists these organizations in assessing, monitoring, protecting, and managing the earth's renewable natural resources.

CMI obtains most of its research funding through grants and contracts and receives almost no additional support from the college or the Commonwealth. If you would like to help support CMI, donations can be made to the Virginia Tech Foundation in the name of "Conservation Management Institute" at the Virginia Tech foundation web site located at www.vtf.edu. CMI's website can be found at *www.cmiweb.org*.

Brunner Co-Investigator In Large Grant For Biofuel Research

U.S. Energy Secretary Samuel Bodman and Agriculture Secretary Mike Johanns announced that starting this year, the Department of Energy and the Department of Agriculture will provide a combined $8.3 million in funding for 11 projects. The selected projects all focus on biobased fuels research designed to accelerate the development of alternative fuel resources.

Virginia Tech will receive one of the largest award amounts, and it will total $1.2 million. This money will go to support a research initiative focusing on protein-protein interactions. Amy Brunner, an associate professor of forestry, will be conducting the project along with Eric Beers, an associate professor of horticulture, and Allan Dickerman, an assistant professor of bioinformatics.

Protein-protein interaction is used by plants to control cell wall related biomass production. The plant that Brunner and her colleagues will be using will be the

Amy Brunner surrounded by the poplars she will be conducting research on.

poplar tree. It is ideal because it is considered a model biomass crop, meaning that it can be easily grown and harvested to help produce biofuel.

"Our new project aims to identify the protein-protein interactions in poplar wood important for biomass production that will ultimately guide design of strategies for molecular breeding of productive biomass crops," said Brunner.

INTERNATIONAL CROSSINGS

Canadian Embassy Gives Grant To Resler For Mountain Geography

Fjords in the Long Range Mountains, Newfoundland. The Long Range Mountains are the northernmost extent of the Appalachian Mountains in North America.

Lynn Resler, assistant professor of geography, was awarded a Faculty Enrichment Grant from the Canadian Embassy for her proposal entitled, "The Mountains that Join Us: Developing Canadian and American Case Studies from the Appalachian and Rocky Mountains for a Mountain Geography Classroom." The grant will allow Resler to enhance her existing upper-division geography course, Mountain Geography, by adding Canadian mountain case studies to allow comparative analysis of the physical and cultural geography of the Rocky and Appalachian Mountains.

"A course on the geography of mountains provides a meaningful and unique framework for teaching students about environmental issues collectively facing Canada and the United States," said Resler. She added, "Latitudinal comparisons of environmental issues and natural resources will allow students to learn about the extreme variation in climate, topography, and biodiversity across the expanse of the Appalachians and Rockies, and how these physical factors influence culture, society, tradition, and policy making."

Resler includes ample American case studies from both the Rocky Mountains and the Appalachians in her Mountain Geography course. She was inspired to add more international content during the North American Landscapes: Atlantic Canada study abroad course, which she helped lead in summer 2006 along with Bill Carstensen, John Boyer, and Bob Morrill, also from the Department of Geography. "Canada and the United States share two of the world's longest mountain chains - the Appalachian Mountains and the Rocky Mountains. The inherent benefits of these mountains are indispensable; they supply a large percentage of the U.S. and Canadian population with water, food, power, timber, minerals, tourism opportunities, and ecosystem services provided by biodiversity," Resler said.

She noted, "Despite the significance of these mountains to both Canadians and Americans, discussions of the Appalachian and Rocky Mountains in the American classroom frequently neglect that these massive backbones of our continent are physical and cultural systems that extend far beyond political boundaries."

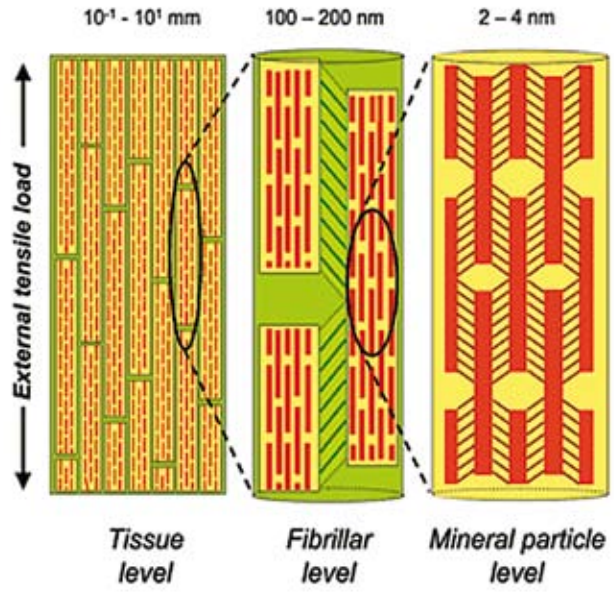
Resler traveled last summer to the Mackenzie Mountain Range in the Northwest Territories and to the Long Range Mountains of Newfoundland to research the cultural and physical landscapes of these mountain environments. She incorporated her findings into her Mountain Geography course in Spring 2008.

Glasser Presents Smart Materials Seminar at Max Planck Institute on Biomaterials

Wolfgang Glasser, professor emeritus in the Department of Wood Science and Forest Products, presented a seminar on smart materials at the Max Planck Institute of Colloids and Interfaces in Germany as part of its colloquium series. The Max Planck Institute focuses research on plant biomechanics, biomimetic materials, and bones and other mineralized tissues. His topic was "Wood: Are molecular interactions responsible for smartness and self-repair." "Smartness" refers to "smart materials" that have the ability to self-repair and adapt to the environment, keeping their mechanical functions and original character in tact.

Scientists at the Max Planck Institute had made observations about wood that were similar to the characteristics of bone structure. They called this behavior "stick-slip behavior," where the wood reorganizes on a molecular level as a way to self-heal. This behavior is normally typical of the animal kingdom. On a nanolevel, both plant and body materials have similar structural designs. Wood scientists working side by side with medical scientists at the Max Planck Institute are using these new findings to conduct research on designing more efficient composite materials for industry use, "which is unique in the world," Glasser pointed out. " I was fascinated by the parallels of studies on the human body materials and those on wood and was able to provide an explanation for the behavior based on work I had done almost 30 years ago." The ability of wood to self repair like bone does in living beings has been the topic of research for Glasser's entire career in wood science.

While in Germany, Glasser also served as a consultant for the Fraunhofer Institute on Applied Polymers (IAP), one of 60 Fraunhofer Institutes in Germany and the leading organization which holds the critical patents for MP3 digital audio encoding technology.



A nanoscale composition of a structure that could be wood or bone.

EXTENSION AND OUTREACH

Urban Forestry Initiative In Northern Virginia: Turning Over A New Leaf

Individuals from various municipalities and public agencies in northern Virginia have been working together to plan and deliver the region's first Urban Forestry Conference with a primary aim to build collaborations and together advance urban forestry efforts in the region. About 100 people representing the general public, all levels of government, a variety of practitioners, and elected and appointed officials have come together to discuss the impact of trees on air quality.

Adam Downing, Extension agent of forestry and natural resources for the northern district Virginia Cooperative Extension explained, "Planting trees can help various localities to come into compliance with EPA-designated, eight-hour air quality standards," Downing explained, "and this can be a useful, timely tool to advance urban forestry efforts in Virginia."

As a result of discussions initiated at the "Clearing the Air with Virginia's Trees" conference last year, a series of quarterly roundtables have met to continue the dialogue. The kick-off "Northern Virginia Regional Urban Forestry Quarterly Roundtable" meeting was hosted by Arlington County where participants had the opportunity to hear from Arlington's Director of Intergovernmental Relations, Frank Shatroth, about how to communicate to decision makers so they understand the importance, in this case, of trees in urban areas.

Hosted by Fairfax County and the towns of Leesburg and Herndon, subsequent meetings have been a mixture of sharing experiences and discussing how distinct municipalities can come together to more effectively bring needed legislation changes to better enable urban forest management in northern Virginia. The roundtable meetings are focused on identifying and working toward a common goal. Downing added, "The roundtables have produced a well defined group of urban forestry advocates working on effecting positive and lasting change for Virginia's urban forests."

The conference and roundtables are a cooperative effort of various local government jurisdictions, Lardner/Klein Landscape Architects, Northern Virginia Regional Commission, Town of Leesburg, Trees Virginia (Virginia's Urban Forestry Council), Virginia Cooperative Extension, and Virginia Department of Forestry with support from USDA Forest Service, Urban and Community Forestry Program.

Roundtable Panel members (L-R) Judy Guse-Noritake, VDOF Board of Forestry; Virginia Senator Patricia S. Ticer; Delegate David L. Bulova; moderator Mike Knapp, Fairfax Urban Forester Division Director.

Payne Publishes Book On Wildlife Management

Neil F. Payne, '64 M.S. in fisheries and wildlife, recently co-authored and published *Wildlife, Conservation, and Human Welfare: A United States and Canadian Perspective* along with Richard D. Taber, a former graduate student from the Aldo Leopold School. The book focuses on the impact of society on wildlife populations and their welfare in the United States and Canada, with important relevance to global development and its future effect on the environment. Its purpose is to provide guidance leading to nationwide and worldwide restoration and maintenance of wildlife.

Neil Payne

Payne worked for Taber from 1973-1975 at the University of Washington while Taber was working on the manuscript. They maintained their friendship over the years, and when Taber retired in 1993 Payne asked him about the unfinished manuscript. It was then that Payne and Taber collaborated to finish the book while Payne taught full time at Wisconsin-Stevens Point University.

The book has had acclaimed reviews by the *Canadian Field-Naturalist and the Journal of Wildlife Management*. Falk Huettman, of the Institute of Artic Biology at the University of Alaska, said, "This book is one the best reads as a resource for wildlife management issues and related details. One might hope from this great book that wildlife managers will read, learn, and become environmentally considerate."

When asked about his book, Payne mentioned, "Environmental damage and concern has finally become political nationally, even worldwide. We tried to write the book in such a fashion that it would be read by professional wildlifers and teachers, wildlife administrators, and the interested and influential public."

After more than thirty years of experience and academic training in wildlife management, Payne has authored and co-authored several books on wildlife management. He currently resides in Plover, Wis., where he is professor emeritus of wildlife in the College of Natural Resources at the University of Wisconsin-Stevens Point.

Park Works To Save American Eel

The American eels, once believed to have a limitless population, have been in sharp decline in recent years, leaving researchers and scientists baffled. For this reason, much research has been focused on eel restoration. Ian Park, '06 B.S. in fisheries science, has been working on projects to restore the American eel population in the region.

Former fisheries and wildlife graduate student, Ryan Smith, '95 M.S. in fisheries science, handles an American eel during field sampling.

As a biological technician in the Maryland Fishery Resources Office of the U.S. Fish and Wildlife Service, Park is currently working at two dams on the eastern shore to better understand juvenile eel migration patterns and provide access to historical nursery habitat.

"At both sites we are trying to create structures for eel passage that will allow juvenile eels passage over structures to upstream habitat," said Park.

Very little is known about the American eels due to their complex migration patterns; however, they are an important link in the ecological food chain and help to fuel the Virginia fishing industry. They have also been known to be culturally important to Native Americans.

Fisheries and wildlife science professor Paul Angermeier, who has also worked on eel restoration research, stated, "The American eels are an important fish because of their economical, biological and even cultural implications. Historically, I would consider eels a keystone species."

Kaichang Li Receives 2007 Presidential Green Chemistry Award

Kaichang Li, '96 Ph.D. in wood chemistry, has received the 2007 Presidential Green Chemistry Award for the development and commercial applications of using soy-based adhesives for making wood composites. This is the first time that a Virginia Tech graduate has been awarded this honor. The Environmental Protection Agency presented the award to Kaichang, now associate professor in the Department of Wood Science and Engineering at Oregon State University (OSU). He collaborated with Columbia Forest Products (CFP) and Hercules Incorporated to commercialize the soy-based adhesives for production of interiorly used plywood and particleboard.

The production of wood composites such as plywood, particleboard, and medium density fiberboard usually utilizes formaldehyde-based adhesives such as urea-formaldehyde (UF) and phenol-formaldehyde resins. Formaldehyde, a known human carcinogen, is emitted in the production and use of wood composite panels that are bonded with UF resins. CFP has replaced UF resins in its production with the soy-based adhesives, developed from soybean flour starting in April 2005. In 2006, an estimated 47 million pounds of toxic UF resin was replaced. Since then, CFP has reduced the emission of hazardous air pollutant by 50-90 percent.

The soy-based adhesive technology, initially invented by OSU, was inspired by adhesive properties of mussel adhesive protein. Kaichang's research program focused on mimicking marine adhesive proteins (MAPs), found in mussels, using renewable soybean flour. The soybean-based adhesive has both the strength and impermeability of MAPs, making it much more stronger than UF resins. This technology can greatly enhance the competitiveness of the U.S. wood composite companies and benefit U.S. soybean farmers and rural economy due to its low cost, efficiency, and dependence on the soybean industry.

Kaichang Li

When talking about the impact on the environment, Kaichang said, "This new technology will greatly improve our indoor air quality when more and more wood composite manufacturers use the soy-based adhesives."

Clear Skies for Homecoming

After a Friday of torrential rain, more than 150 CNR alumni and friends enjoyed a sunny Saturday, September 15, morning with clear skies for Homecoming at Cheatham Hall. The Hokies faced Ohio University at 1:30 p.m. after alumni and friends reconnected with CNR faculty, administrators, and staff for several hours.

Forestry Ph.D. candidate Brad Miller catered the Pig Pickin' buffet and the homemade ice cream social with the best food ever. Corporate sponsors, CHR Forestry, MeadWestvaco, and Morgan Lumber Company provided contributions that made this event a fun gathering.

Faculty and departments set up information displays in Cheatham Hall and student clubs carried on fund-raising activities. Many of the alumni had Hokie Bird and VT face decals applied by CNR Ambassadors. The college sponsored a tree planting to commemorate those who lost their lives on April 16. Dean Kelly invited those attending to help with the memorable planting event.

Many of the homecoming attendees continued on to Lane Stadium to see the Hokies defeat Ohio University, 28 – 7. It was a great day for CNR and Virginia Tech.

The 2008 CNR Homecoming will take place again in fall, 2008. Check the www.alumni.vt.edu website in early 2008 for the date, or contact Patricia Foutz at *pfoutz@vt.edu* or (540) 231-2512 for more information.

Upcoming Alumni And Friends Receptions And Special Events

DETAILS TBA
AFS Southern Division Conference
Wheeling, WV

MARCH 19, 2008
CNR Student Awards Banquet,
Time 6:30 p.m., German Club
Blacksburg, VA

MARCH/APRIL, 2008
American Fisheries Society Student Chapter
24th Annual Mudbass Tournament
at the Duck Pond
Blacksburg, VA

VirginiaTech
Invent the Future

Wildlife Professor Brings Africa to the Classroom

Lions. Crocodiles. Elephants. You might come across these on an African safari, but certainly not at Virginia Tech. Right? Well, not until Kathleen Alexander arrived from Botswana. Alexander, who joined the college this fall as an associate professor in the Department of Fisheries and Wildlife Sciences, integrates her African research studies in the class she teaches on infectious disease ecology.

"I'd like students to look at infectious disease as an ecological factor affecting the ecosystem and not simply the process of looking for animals that are dead or sick. Just as one needs to know about water, prey, and vegetation, ecologists also need to know about infections disease, because we're finding in many instances, coupled with other variables, infectious disease is one of the determining factors of a population's survival," said Alexander.

Her research is directed at better understanding the human wildlife interface in Africa with a focus on infectious disease dynamics, wildlife conflict, and identifying new ways to integrate local communities into management of natural resources. Alexander lived and worked in Botswana for over 17 years, where one-third of the population lives below the poverty line. Botswana's wildlife resources provide much of the country's tourist-based revenue, but wildlife is increasingly a source of conflict to local communities as they cause severe damage to property and rural livelihoods.

Together with her husband, Mark Vandewalle, (a newly appointed adjunct professor in the college with a doctorate in ecology), Alexander designed, developed, and managed a regional conservation research program for Northern Botswana through her role as president of the Centre for Conservation of African Resources: Animals, Communities and Land Use (CARACAL).

CARACAL's program is directed at securing the health of Northern Botswana's ecosystems and sustainable use of natural resources in rural areas. Alexander's work there included wildlife health and ecology, community based natural resource management, wildlife conflict resolution, endangered species management, wildlife capture, ecosystem management and training of citizens and government officers to manage natural resource more effectively.

In addition to her work with CARACAL, Alexander was the senior wildlife veterinary officer for the Department of Wildlife and National Parks in Kasane, Botswana. There, she established a Wildlife Veterinary Unit responsible for delivering wildlife health services to the entire country. She also served as the ecological adviser in the office of the president of Botswana.

Alexander maintains her position with the organization and hopes to involve the Virginia Tech community with CARACAL in Botswana. Her paper, "Emerging disease and transmission of human pathogens to free ranging wildlife," was recognized as one of the Top Science Stories of 2002 in Discover: The Year in Science.

"One of the things I'd really like to do is to get students to start thinking about the real world application of what they're being trained in. Instead of only thinking about research or where their career will go, students should focus on how to take what they've learned and make a difference in the world," she said.

"I'd like students to start thinking about the policy framework, international convention, and other issues which influence natural resources management. I plan to take examples from Africa and present situations to students so that they can apply what they are learning to real problems, making education a real world exercise," said Alexander. She will be taking this further as she develops a field course in Botswana, which will allow students to immerse themselves in real world conservation problems.

Currently, Alexander's children and husband are with her in the United States. The whole family will be traveling between Virginia and Botswana as they continue their work in Africa and now, Virginia.

Alexander and Botswana Defense Force investigate the death of a crocodile over 15 feet long.

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