



ADVANCING THE SCIENCE OF SUSTAINABILITY

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PARTNERSHIP GREEN ALL AROUND

College partnership with Forest Service leverages sustainability efforts

The college’s partnership with the U.S. Forest Service (USFS) provides resources to build a sustainable environment and opportunities for students to work in the field. “The partnership advances research and education in the college as well as the Forest Service mission — ‘Caring for the Land and Serving People,’” said Andy Dolloff, adjunct associate professor and team leader for fisheries and aquatics with the USFS Forest Watershed Science research work unit, located in Blacksburg.

Through cooperative agreements, the Forest Service provides vehicles, equipment, time, and expertise in mentoring both undergraduate and graduate students across campus. “Our team also collaborates with departments to conduct research and serves on graduate committees in the colleges of Science, Engineering, and Agriculture and Life Sciences in addition to Natural Resources and Environment,” Dolloff added.

“Our partnership with the Forest Service leverages the mission, the passion, and the intellectual expertise of the scientists of both organizations, which is an enviable combination to match in any business or organizational setting,” said Dean Paul Winistorfer. “The leverage and outcomes are exceptional.”

In a current project, faculty members and students are working with Dolloff to measure the impact of climate change on mountain streams. He is collaborating with Paul Angermeier, Emmanuel Frimpong, and Eric Hallerman in the fish and wildlife conservation department and Eric Smith in the statistics department using \$250,000 of a \$1-million grant shared between the USFS and the U.S. Geological Survey.

“We asked ‘What is going to happen to cold-water habitats?’” said Dolloff. “Conventional wisdom says the habitat for cold-water fish like Brook Trout will retreat to the mountains above 1,200 feet elevation — below that, it is already too warm to support trout.”

The study benefits from a range-wide assessment commissioned by the Eastern Brook Trout Joint Venture (EBTJV) conducted 10 years ago. In 2005, alumnus Mark Hudy (’78 B.S. in fisheries and wildlife), at the time a USFS aquatic ecologist, did a state-by-state inventory of

streams where Brook Trout were historically located. He plotted the results with GIS and made them available online through the EBTJV and Trout Unlimited. In 2009, he monitored the water temperature for one year in 50 of the approximately 3,000 streams in Virginia that historically supported brook trout.

“The grant has been used to expand the study from Maryland to Georgia,” said Dolloff. “We are now looking at 200 streams — 50 in western Maryland and West Virginia, and 100 in North Carolina, Tennessee, South Carolina, and Georgia, along with the original 50 in Virginia.”

The grant was used to purchase instruments to collect water and air temperature every 30 minutes, making this one of only a handful of studies in which such data are tracked year-round. The equipment was first placed between October 2010 and January 2011. “This fall and winter marks the three-year point, with each site visited three times a year,” said Dolloff.

Currently, the biggest task is data management and quality assurance and control. The researchers contribute to a multi-agency website (<https://www.google.com/fusiontables/DataSource?snapid=S37531370pY>) using Google Earth to plot where the temperature data are collected. “You can click on a dot and see who owns an instrument and when it was installed,” said Dolloff. “Ultimately, we hope to have readouts online as well. The idea is that people will see the value of having this type of information available.”

With three years of data, the researchers can compare air and water temperature relationships and tease out what is happening. “For example, streams with ground water may maintain a lower temperature,” Dolloff explained. “It’s rare, but there are variations. Those variations are what we look for.”

Such information will help with land management decisions, such as where to invest to maintain or restore streams. “Once we locate a stream that is a

Long-term research is revealing new information about how American Eels live in mountain streams.



Andy Dolloff, who has led the Forest Service fisheries and aquatics team at Virginia Tech for over 25 years, records data on stream habitat quality.

candidate, we can do intensive monitoring, such as deploying additional temperature sensors in individual watersheds,” Dolloff said.

Over 25 years, Dolloff and the USFS have been able to amass data that continues to be a valuable resource. “I can keep cycling back and add to long-term data sets. For example, American Eels on the Tye River have been studied for 15 years. This summer, we recaptured eels that we tagged 13 years ago. This ability to establish and maintain a long-term focus is just one of the advantages of being a federal scientist associated with the university.”

Read about another Forest Service-Virginia Tech collaborative partnership on page 2.



Native Brook Trout (top, in left photo) face competition from non-native Brown Trout (center) and Rainbow Trout (bottom) in warming streams.



Monitoring high-quality watersheds can include underwater counts of Brook Trout.



Appalachian mountain streams are the focus of a collaborative research effort on climate change impacts.



With new degree programs in place, record enrollment, a strong research agenda, and award-winning outreach to the commonwealth, we have to ask, "What's next?" as we peer into the future. We are continually reflecting as we look 10 years ahead. More than one-third of our faculty will be eligible for retirement in the coming decade. Planning ahead will pay off as we look for ways to innovate in our teaching, research, and outreach programs. We are beginning now to take a deeper look into the many faculty changes likely to come. Our faculty are the foundation of the college and our most important resource.

Looking ahead, infrastructure is the biggest challenge we face and must be addressed to ensure our successful future. Our infrastructure will not allow for additional growth of the college as all offices, labs, and classrooms are at capacity. Neither the quantity nor quality of our space is adequate for our future.

We received great news from the QS World University Rankings of academic programs. Our forestry program is among the elite programs in the world, one of only a few such recognized programs at Virginia Tech! A few years ago, the National Research Council ranked our forestry doctoral program as one of the best in the country and the top doctoral program at Virginia Tech.

I want to acknowledge the partnership we enjoy with our federal agency partners, as highlighted in



Cheatham Hall has served as the college's home since its construction in 1972. College faculty and staff are currently housed in 10 different buildings on campus.

our cover story. Federal scientists working on our campus bring expertise and synergism to our mission of teaching, research, and outreach. We value and appreciate the working relationships we have with our agency scientists.

The college's annual awards celebration in April (to be featured in summer's CNRE News) recognized the many outstanding students in the college for their accomplishments. A number of our donors joined us for the evening as we celebrated the awarding of nearly \$220,000 in scholarships and other recognitions. Helping students through school

is the best investment we can make in the future. Thank you to our many donors and to the Virginia Forestry Educational Foundation, its directors, and donors for your very significant support.

At the awards celebration, we recognized Carl Garrison ('78 B.S. in forestry) with the Alumni Award of Achievement. This very special honor recognizes Carl for his many contributions to natural resources and forestry stewardship and for his leadership in the Virginia Department of Forestry. Carl has served the college in various capacities throughout the years. Carl, you make us very proud, and we are thankful that your path crossed ours.

Incoming Virginia Tech President Timothy Sands made a brief visit to our college this spring, and we look forward to working with him when he begins his duties June 1. We are thankful for the long-term support, vision, and leadership of President Steger.

Thank you for your interest and support of all we do. I welcome your thoughts on "What's next?"

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Fish species benefit from multi-agency collaborations

Among the many multi-agency collaborations that have benefited the college and the environment (see front cover story), a recent project studies aquatic organism passage in streams. "Teams in the Pacific Northwest concentrate on trout and salmon, whereas our team at Virginia Tech and the U.S Forest Service (USFS) Center for Aquatic Technology Transfer (CATT) is looking at nongame animals, including darters, creek chubs, and other minnows and crayfish," said Andy Dolloff, adjunct associate professor and director of the CATT.

The research can answer questions such as whether fish are moving through barriers (e.g., culverts under roads) and if they are moving only downstream or upstream. "We use microchips in fish just like you put in your dog or cat," said Dolloff. "Our team is also working with another USFS-university team at the University of Massachusetts on a genetics study to detect whether chub and other species are isolated by potential barriers such as culverts."

Culverts with a significant drop from one end to the other, too shallow water depth, or smooth pipes that do not have natural substrate may create velocity barriers that prevent fish from moving, especially in the upstream direction. Since 2006, an ongoing partnership between the USFS-CATT and the college has been at work to identify and evaluate the passage status of the estimated 50,000-plus culverts in southern national forests. The resulting database can be queried by managers who need to know where barriers are located and which barriers can be removed or altered to achieve a desired result for a given level of funding.

But how does a manager decide which problems to tackle first? Enter the Crossing Area Decision Support System (CADSS), a GIS-based decision management tool developed by CATT biologist Craig Roghair and Conservation Management Institute researcher Laura Roghair and colleagues. CADSS analyzes information on species distributions, land ownership, crossing location, difficulty of fish passage, and other user-defined preferences to recommend crossings or combinations of crossings for replacement or upgrade. Outputs include a top-10 list and maps of reconnected stream reaches, allowing managers to quickly visualize different replacement scenarios. "The result can be presented as a color-coded map of the forest road system showing various possibilities," Dolloff explained.



The estimated 50,000-plus crossings in southern national forests come in a wide variety of sizes and shapes, each presenting challenges for fish passage.



Pipes with significant drops can block many fish from passing upstream.

*Photos courtesy of the U.S. Forest Service
Center for Aquatic Technology Transfer.*



Hokie Nation Network, a portal for alumni interested in professional networking opportunities, leverages social media, job listings, and other career resources designed to help Hokies connect with fellow alumni. Visit alumni.vt.edu/hnn to start networking today!

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Plaid Avenger takes to the high seas

Last fall, geography instructor John Boyer, aka the Plaid Avenger, took to the high seas on a Semester at Sea (SAS), an independent study abroad program in which students and teachers sail to over a dozen ports of call. While globe trotting, Boyer taught his World Regions and Geography of Wine courses for SAS while also teaching World Regions remotely for Virginia Tech.



With the help of his trusty assistant, Katie Pritchard, John Boyer recorded mini lectures all over the world to broadcast to his World Regions students on campus. Here, they are atop Lion’s Head Mountain overlooking Cape Town, South Africa.

During his adventure, he recorded mini lectures from all over the world. Back in Blacksburg, his students watched as Boyer discussed gaucho culture saddled atop a horse in the Pampas of Argentina and lectured on the iconic Nelson Mandela in Cape Town shortly before the great man’s death. He also connected to students by hosting live, interactive Q&A’s from across the globe.

“We employed a variety of strategies to not just keep the class going but to keep it engaging and try to have as much interaction with me as possible even though I was not physically in Virginia,” Boyer explained.

The SAS provided an ideal opportunity for Boyer to further incorporate online tools into his teaching as well as demonstrate that massive online open courses can be both engaging and effective. Demand for such techniques is evidenced by his packed courses and the overwhelmingly positive response he receives from students. For example, he is the country’s fifth most-followed professor on Twitter and has received the Student’s Choice Award for Faculty Member of the Year for eight years in a row.

“We’re living through this awesome age in communications technologies that is allowing for interaction with all humans all the time, and I wanted to see more educational stuff done with it,” said Boyer. “I’m all about melting the walls of the classroom and really marrying a kind of classical education with the real world.”



John Boyer and his son, Jones, mug for the camera in Morocco.

Boyer has used technology to connect his World Regions class with international leaders. In his latest effort, Boyer and his students invited King Abdullah II of Jordan to come to Blacksburg. The king made concrete plans to visit but was thwarted by the February snowstorm. He responded with a video of his own that included a heartfelt apology and welcomed Boyer’s students to visit Jordan.

With unconventional yet successful teaching methods come notoriety. In April, Boyer was featured in the New York Times article “10 Courses With a Twist,” highlighting how his ‘70s-style plaids, student-friendly lingo, and use of social media to connect with students, who get to choose how they engage in the course and what assignments they do.

Online community promotes forest farming

Virginia Tech is leading the effort to use the new online research-based learning network eXtension to promote forest farming — the cultivation of high-value specialty crops under a forest canopy. Launched in 2008, eXtension was created as a virtual space for the exchange of ideas and information as well as the production of new educational resources on a wide range of topics organized as “resource areas.”

The college, with support from the USDA National Institute of Food and Agriculture, the U.S. Forest Service, and numerous partners, launched eXtension’s forest farming resource area, which includes FAQs, articles, a newsletter, webinars, and a video series that covers a wide range of forest crops as well as topics like agroforestry and seed collection. More than 50 professionals contribute to the resource area, and over 100 content projects are either complete or in development.

“In the past, forest farming experts have been somewhat isolated,” said John Munsell, associate professor and forestry management Extension specialist. “This whole idea is to build a collective identity and better define forest farming.”

Site content is targeted to producers and stakeholders who want information that has been developed through a network of forest farming professionals.

Ginseng is among the many species cultivated under a forest canopy.



Under forest farming practices, products are cultivated and managed in farm-like woodland settings that have been modified to provide the correct shade and microenvironment so growth can be sustained and the output secured year after year.

“One benefit of forest farming is income for landowners while their timber matures or other longer term objectives are pursued,” Munsell said. “In addition, there’s the added benefit of the conservation of economically and culturally important forest products.”

Munsell and forestry doctoral student Catherine Bukowski are lead coordinators of the project. Key partners include Jim Chamberlain of the U.S. Forest Service and Mike Jacobson of Penn State, as well as the USDA National Agroforestry Center and Cornell University.

(Left to right): John Munsell and Jim Chamberlain listen while landowner Dave Carman explains how he cultivates fairyland, a native woodland medicinal plant. The roots have a market value upwards of \$60 per dried pound.

Virginia Tech ranked as ‘elite’ among world universities

Virginia Tech is ranked as an elite institution in 13 of the 30 subjects evaluated at more than 3,000 universities worldwide, putting it in the top 200 of the ranked programs. The overall ranking for Virginia Tech compared to the total ranked universities for 2013-14 is 316; the school was ranked 337 in 2012-13. In some of the subjects — agriculture and forestry, civil engineering, electrical engineering, and mechanical engineering — Virginia Tech ranked in the top 100 of the 10,639 programs evaluated.



Virginia Tech’s forestry program placed in the top 100 in the QS World University rankings.

The forestry program also placed in the top 100 in the QS World University rankings. “Virginia Tech’s forestry program has been recognized as a top program in North America for many years, so it is not surprising that it ranks in the top 100 around the world,” noted Dean Paul Winistorfer. “Our superlative teaching and research focus on the latest applications to uncover the science needed to manage forests and other natural resources.”

The rankings are based on survey responses by faculty throughout the world, but respondents are only asked to evaluate universities in their region. This year, more than 62,000 faculty members responded and almost 74 percent of the respondents were professors or associate professors.

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Join students and non-students alike for a unique summer course, **Natural History of the Great Smoky Mountains** (FIW 4984, CRN 72572), open to anyone interested in learning about the environment. Dr. Don Linzey, who has been conducting research in the Great Smokies for over 50 years, will lead the weeklong residential program at the Great Smoky Mountains Institute Aug. 3-9.

Topics covered will include:

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- Stream ecology
- Tree identification

Visit vtnews.vt.edu/articles/2014/04/040814-cnre-smokiessummercourse for details and registration information.



Weather stations promote a range of study at Roanoke schools

Geography doctoral candidate **Tammy Parece of Blacksburg, Va.**, wanted to find the best locations within the city of Roanoke, Va., for growing gardens. “I’m interested in the health and welfare of the urban population,” she said. “Food security, meaning how available food is in neighborhoods, plays a big role in the health of cities.”

That idea, which became part of her dissertation study, led Parece to spearhead an effort to install weather stations on the roofs of a dozen Roanoke City schools so that she could conduct research using geospatial technology to optimize urban agriculture. Meanwhile, a generation of Roanoke school children is growing up learning about forecasting weather.

Tom Fitzpatrick, science supervisor for Roanoke City Schools, embraced the idea, recognizing the benefit of strengthening the local curriculum in science, technology, engineering, and mathematics (STEM). The city already had stations at three schools; Parece’s efforts raised that number to 15. “It’s been exciting to see kids get involved in some hands-on science with live data,” said Fitzpatrick.



Tammy Parece (right) enlisted meteorology major Mario Garza to help install the weather stations.

He noted how children are learning to graph various kinds of data, such as temperatures at different locations. They’re also learning how to make weather forecasts. Students feel an ownership of the weather stations. “It’s on the roof of their building,” Fitzpatrick said. “They can see it.”

A receiver inside the school building sends the weather station’s information to the website Weather Underground, which is available to the public. Data reported include temperature, humidity, wind, and elevation.

Parece drew from a number of sources to fund the project, including her own grants and scholarships, and several Virginia Tech students were involved. Geography master’s student **Paul Miller of Franklin, Tenn.**, was tapped to install software on the stations and played a key role in getting the observational data online. **Mario Garza of Albuquerque, N.M.**, a senior meteorology major, drew upon his strong technical background to help install the stations.

So far, the project has been a great success. “It was great to get the ‘buy in’ from the school system to install the weather stations, but we wondered if the teachers were going to use them,” said Parece. She got an answer to that question quickly. “The teachers were immediately asking, ‘When are your students coming down? When can you help us learn how to use this?’” she said.

Meanwhile, Parece is collecting data from the weather stations for use in her study of urban agriculture, which she calls a geographical concept. “It’s not about agriculture. It’s not urban studies,” she said. “I’m looking at the environment. I’m looking at the human aspects, both social and economic. That’s what being a geographer is about. We are not separate from the environment.”

Forestry Club hosts Southern Forestry Conclave

The Virginia Tech Forestry Club hosted the 57th annual Southern Forestry Conclave March 14-15 at Claytor Lake State Park. An estimated 250 participants and advisors from 15 schools, including Alabama A&M, Clemson University, the University of Georgia, Florida State University, and North Carolina State, attended the weekend-long competition. Participating schools rotate hosting the annual event.



The pole climb is one of the many events in the conclave.

“The level of organization and planning required to carry out the conclave was just mind boggling,” said Assistant Professor Jason Holliday, faculty advisor to the club. “I was thoroughly impressed at the level

of professionalism with which the club approached this event.”

The club’s student conclave committee — Drew Cockram, Mason Thomas, Donnie Reese, Kimberly Pittard, and Alyssa Hamill — began planning last July. Hundreds of letters were sent to corporate sponsors, local businesses, family, and friends to raise funds. Generous donations from across the state made possible the purchase of lumber, tools, trophies, banners, and catered meals.

“I am especially proud of all our club members for stepping up and working endlessly on setting up this prestigious event,” said Cockram, committee co-chair. “We can proudly take ownership in the fact that we made the conclave happen from scratch.”

The competition consisted of physical and technical events. Physical events included log birling, log chopping, pole climbing, crosscut sawing, and axe throwing. The Virginia Tech men’s crosscut team came in first overall, and its Jack and Jill (male and female)



Virginia Tech’s team placed in two events.

crosscut team earned second place. Technical events included compassing and pacing, pole classification, timber estimation, and wildlife and wood identification.

“We would like to extend our gratitude to Dr. Jay Sullivan, Sue Snow, and Tracey Sherman,” Cockram added. “Dr. Sullivan gave our club unconditional support and praise throughout the preparation and hosting of the conclave, and Sue Snow and Tracey Sherman helped tremendously with the organization and preparation leading up to the event.”

Students visit The Weather Channel



Much has changed since three Virginia Tech students attended the American Meteorological Society’s conference a few years ago. Meteorology achieved degree status in January 2012 and has since become one of the college’s most popular programs. This year, 16 current students, joined by a recent alum, attended the society’s conference in Atlanta and were treated to a personal tour of The Weather Channel’s facilities by alumna Kathryn Procriv (’11 B.A. and ’12 M.S. in geography), who works there as a weather content producer and graphic meteorologist.

Restoring Ireland’s native woodlands



Photo courtesy of Aolfe Herriott Photography

Anna McAuley of Arlington, Va., (left) and **Sarah Schneider of Wheeling, W.Va.**, plant native holly in Ireland’s Connemara National Park as part of a reforestation project to reestablish native woodlands. Students in the semester-long Culture, Natural Resources, and Design in Ireland course visited Ireland during spring break. They worked with students from the Galway-Mayo Institute of Technology, with which the college has an ongoing collaboration, on the reforestation project as well as on developing interpretive materials for the project.

Research is a critical component of the college’s mission of Advancing the Science of Sustainability. The short summaries below provide a glimpse into the wealth of research for environmental sustainability being conducted by our world-class faculty members. Visit vtnews.vt.edu/feeds/natural-resources.html to read the full stories behind these summaries as well as other press releases pertaining to the college.

Simple questionnaire can improve diarrheal disease response in Africa



Using a simple survey tool, a team of researchers led by Associate Professor Kathleen Alexander has done what complex studies have failed to do — provide data that identifies starting points for preventing diarrheal disease outbreaks in the Chobe District of Botswana.

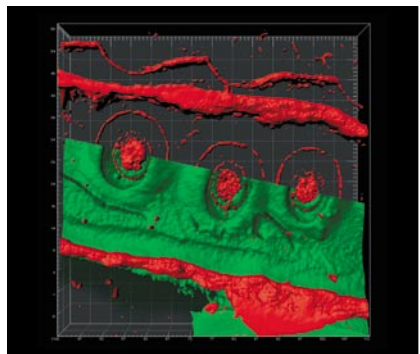
Using only local nursing staff in the resource-strapped region, the questionnaire approach proved successful, providing information that would not have otherwise been available and leading to immediate recommendations regarding control.

Kathleen Alexander (left) and Mpho Ramotadima, community extension officer at CARACAL, the nonprofit organization Alexander co-founded, check water quality at a public faucet in a Botswana village.

“This approach does not require increased human or economic resources or outside researchers, and it can give immediate insight into public health threats and disease outbreaks. This is an important starting point,” said Alexander, whose research was published in the journal BioMed Central Public Health.

“The purpose of the questionnaire-based study was to try to find a way that governments could begin to accumulate information on outbreak features that could be used even in the face of significant human resource, infrastructure, and technology constraints,” she continued. “If we wait until there are more resources available to do sophisticated studies, they will never happen and we will continue to battle with diarrheal disease in much of Africa.”

Why don’t trees ‘bleed’ when injured?



Featured on the cover of the American Journal of Botany, this image depicts three bordered pits in a 3-D microscopic cross-section of pine, with cellulose shown in green and pectin in red.

Professor Barry Goodell and his colleagues from the Virginia Agricultural Experiment Station; The Jackson Laboratory in Bar Harbor, Maine; and Georg-August University in Gottingen, Germany, discovered how “check valves” in wood cells control sap flow and protect trees when they are injured. Their work was featured on the cover of the American Journal of Botany. Thanks to a powerful new type of microscope, scientists can now see nanostructures in wood fiber cells in a more natural state.

A tree’s fluid sap passes from one cell to the next through nanostructures called bordered pits. Each pit contains a mesh of cellulose fibers that radiates out from a thickened, solid, central region called the torus — looking somewhat like a bull’s-eye in a target. Fluids ooze through the mesh-like membrane, around the torus, and out the other side.

The scientists have discovered how some of the nanostructures of the membrane move with the torus to seal off the pit when wood is damaged or is being dried, which helps explain how trees seal off their cells so that they don’t “bleed to death” or lose all their sap when they are injured.

Research overturns assumption about mercury in the Arctic



Mercury concentrations have declined in burbot fish from some Russian rivers.

For years, scientists have assumed that if mercury is high and increasing in fish in the North American and European Arctic, the same is true of fish elsewhere in the Arctic. But a team of scientists from the U.S., Russia, and Canada has discovered that assumption is wrong in much of the continental Arctic. They found lower mercury concentrations in fish from select rivers in Russia near areas where the economy has declined since the fall of the former Soviet Union in 1991. Assistant Professor Leandro Castello is first author on a paper about the finding published in the journal Environmental Science & Technology.

In Russia, the economic decline near the watersheds of the Lena and Mezen rivers lowered polluting activity there, making their burbot fish now safe to eat. Mercury concentrations in fish from the two rivers were found to have been on a decline by 2.3 percent a year, whereas in North America concentrations have been increasing by 5 percent a year.



Hurricane Sandy may prove to be a blessing for the tiny piping plover

As it left a path of destruction on Eastern U.S. shorelines, Hurricane Sandy created three inlets on Long Island’s south shore, two of which have since been filled by the U.S. Army Corps of Engineers. Professor Jim Fraser hopes the third inlet, located in a designated wilderness area of Fire Island National Seashore, will remain open. The area, New York’s only natural inlet, is shaping up to be an ideal habitat for the federally threatened piping plover.

This new inlet created by Hurricane Sandy on Long Island is expected to produce improved habitat for the piping plover.

“Storm-created habitat is good for piping plovers and other birds,” explained Fraser. Other positive environmental impacts have been observed as well. “Local people say the fishing is better, clams are growing faster, and the water is cleaner.”

Fraser’s work studying these shorebirds confirms that plover populations increase when new habitat is created on barrier islands after massive storms. His ongoing research is monitoring the outcome, and he expects to see plover populations on Long Island surge when the birds return in the spring.

Scientists study Amazon to predict impact of climate change

Scientists from Virginia Tech, the Woods Hole Research Center, and the University of California Santa Barbara are collaborating with Brazilian scientists to explore the ecosystem consequences of three extreme weather events — the extreme droughts of 2005 and 2010 and the extreme flood of 2009 — on the Amazon wetlands.

With funding from NASA, the researchers will look at how the natural seasonality of river levels influences aquatic and terrestrial grasses, fisheries, and forest productivity in the floodplains, and how extreme events such as floods and droughts may disturb this cycle. They will also examine the potential impact of future climate scenarios on the extent and productivity of floodplain forests.

“The research fills an important gap in our understanding of the vulnerability of tropical river-forest systems to changes in climate and land cover,” said Assistant Professor Leandro Castello, team leader.

The huge study area encompasses 1.7 million square miles, the equivalent of half the continental United States. In addition to historical records and ground observations, the researchers will use newly available satellite images of the Amazon and its tributaries over the high- and low-water cycles from NASA’s Earth Science Data Systems Program.



A fisherman and his sons return with their catch of tambaqui, one of the Amazon’s most highly valued fish species dependent on the floodplains.

College welcomes new director of development



Emily Hutchins of New Castle, Va., has been named the college's director of development. Her main responsibility is to help the college meet its goal in securing resources to support its students and faculty, and to enhance the college's programs for teaching, research, and outreach. She will be cultivating personal relationships with alumni, friends, long-time supporters of the college, and potential donors.

"My personal values align perfectly with the college's mission of preparing the future generation of leaders to address the complex natural resources issues facing our planet," Hutchins said. "We all must collaborate together for the health of our society and planet to make a difference for future generations."

Hutchins was the capital and major gifts coordinator at the Denver Zoological Foundation, where she was responsible for the development and rollout of the zoo's first major gifts program in conjunction with a capital campaign. Prior to serving that position, she was managing director of the Mountain Lake Conservancy in Pembroke, Va.

"I feel that my passion for conservation and fundraising will allow me to succeed in the college," Hutchins explained. "I enjoy development work because I get to connect people to support their passion. It's vital to increase philanthropy in our society because I believe that it's our duty as citizens to support the causes we believe in and create positive change in the world."

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Virginia Forestry Educational Foundation expands scholarship program

In today's tough economic environment, students have the advantage of a swell of financial support from the Virginia Forestry Educational Foundation, which has been providing scholarships and other funding for four decades.

In recent years, the foundation has been giving some \$60,000 in scholarships to students in forestry- and forest products-related majors. Next year, the figure will increase to \$70,500. An additional \$42,000 will be allocated to forestry and youth educational programs across the state.

"We are experiencing a much-needed boom in scholarships," said Janaki Alavalapati, head of the Department of Forest Resources and Environmental Conservation. "Our students are passionate about sustainability and the future of our planet. We're grateful to the Virginia Forestry Educational Foundation for the opportunity to help fund their education."

Alumnus John Farmer ('53 B.S. in forestry) has long served as the foundation's president. "We're happy to make an increasingly meaningful contribution to forestry education at Virginia Tech, and we work hard to raise the funds to do so," he said.



"Funding forestry's future is the reason we award scholarships," said alumnus John Farmer, president of the Virginia Forestry Educational Foundation.

The foundation is also a major funder of Project Learning Tree, a national environmental education program of the American Forest Foundation that can be adapted for audiences from preschool through high school. Virginia Tech students help teach Project Learning Tree classes in public schools across the state.

"The foundation's scholarships are a significant contribution to the total scholarship funds available to our students," said Dean Stauffer, the college's associate dean of academic programs. "All scholarships are valued and appreciated."

"Funding forestry's future is the reason we award scholarships to students in the various disciplines," Farmer explained. "They go on to ensure that forests are sustainably managed, which provides the base for a strong forest products industry and ensures the continuation of the many ecosystem services forests provide. Forestry is a huge economic engine for the state as well as the country."

Contact John Farmer at jdfarmer@aol.com or 804-754-0205 for more information about the educational objectives of the Virginia Forestry Educational Foundation.

INTERNATIONAL CROSSINGS

American hardwood market in Vietnam



Assistant Professor Henry Quesada (right) inspects the quality of a moulding operation in a wood processing facility in Vietnam.

Professor Robert Smith and Assistant Professor Henry Quesada of the Department of Sustainable Biomaterials attended the 10th Annual Vietnam International Woodworking Industry Fair last fall. The visit was part of an international marketing project focused on identifying factors that impact the import of American hardwoods in Western European, Chinese, and Vietnamese markets.

Quesada and Smith interviewed American hardwood importers to understand current markets. In addition, they visited a furniture manufacturer and moulding facility that imports radiata pine from Chile and New Zealand, and yellow poplar from the United States.

According to government statistics, more than 300,000 people work in Vietnam's furniture sector. The industry's 16-percent growth over the past five years is due to low labor costs, excellent craft skills, and government incentives to attract foreign investments.

Appalachian companies such as American Hardwood Industries, Turman Group, and Baillie Lumber have already developed a market for hardwoods in Vietnam. Red and white oak, ash, and yellow poplar are the most sought-after products.

Nepalese Fulbright Scholar visits college



Bibhuti Ranjan Jha of Kathmandu University in Nepal spent six months in Blacksburg as a Fulbright Scholar studying fish sampling and data management. "Finding out I had been chosen as a Fulbright Scholar was one of the best moments of my life," Jha remarked.

Jha applied for the highly esteemed Fulbright program at the encouragement of U.S. professors visiting Kathmandu University. "The American instructors wanted the university to have better exchanges with the United States and participate in mutually beneficial programs," said Jha. "Nepal was lacking the basic fundamentals of research. Our scientific records and documentation were inadequate. We didn't have basic primary information about our resources."

Hosted by Professor Paul Angermeier, Jha studied Virginia Tech's different fish sampling techniques and tools as well as how data is managed and documented. He was exposed to new instruments both in the field and the laboratory. "I've met and interacted with academics not only at Virginia Tech, but at other universities as well," he said. "One of the best opportunities was getting to observe the American Fisheries Society meeting in Arkansas in September."

Jha and his family enjoyed their stay in America. His son studied computer engineering at New River Community College and hopes to obtain a student visa to continue his schooling here, and his daughter loved being an eighth-grader at Blacksburg Middle School. The family traveled to New York City, which reminded them of home. "The streets of Nepal are filled with people," Jha explained. "Here in Blacksburg, that's not the case. In New York City, it's like being in Nepal again with the crowds of people."

"I've enjoyed everything about this new experience," Jha continued. "Going out in the field, interacting with students and colleagues, and traveling — everything has been so good."

Alumni Profile

Dana Beegle

Weaving together science and small business practices, **Dana Beegle** ('94 B.S. in forestry) is a shining example of education and entrepreneurship. Beegle applied her forestry background while working as a technical writer for Virginia Tech Pesticide Programs, initially developing training manuals for commercial pesticide applicators and now helping to revise the state's crop profiles on a part-time basis. She also spent three years at Seattle's Washington Park Arboretum, designing and implementing environmental education programs for K-12 youth and public programs for arboretum visitors.

These days, she and her husband Jon keep busy with StoneRoot Farm, their 70-acre property in Floyd County, Va. They sell shiitake mushrooms grown in their woodlands through Good Food–Good People, a Floyd-based local food distributor, and sell pasture-raised beef directly to local families. Jon also operates Bootleg BBQ, a mobile kitchen serving lunch and dinner to customers in town. The couple often tows the kitchen to catering gigs and festivals, and their four varieties of homemade barbecue sauce are sold in local stores.

To supplement their farming operation, the Beegles started a small landscaping company in 2000. They have completed several projects on the Virginia Tech campus, including the Smithfield Plantation parking area landscape and bioretention ponds, and the green roofs on the Agricultural and Life Sciences buildings.

As if working as a technical writer, running a range of home-based businesses, and raising five children weren't enough, Dana decided to return to Virginia Tech in fall 2013 as a part-time student to pursue a master's



degree in agroforestry, working under Associate Professor and Forest Management Extension Specialist John Munsell. But when she was awarded the \$34,200 George E. and Hester B. Aker Fellowship in January, it put her on the short track to pursuing her dream.

"The Aker Fellowship has allowed me to concentrate on my studies so I can complete the program in half the time," she said. Part of the fellowship will be used to support her studies of farmer use and adaptation of agroforestry practices in the mid-Atlantic and the role of permaculture in agroforestry design.

"Once I complete my master's, I plan to apply the principles of agroforestry on my own farm, possibly creating a model farm for the area, as well as work in extension or other outreach or teaching activities related to sustainable land use," Beegle explained. "My goal is to gain the skills and expertise to develop a sustainable, whole-farm plan for our own property as well as to educate others about how agroforestry practices can increase the productivity of land and farms in our region."

If there's one thing this supermom knows, it's that you don't have to compromise your dreams. She is an inspiration to anyone who wants to have their cake and eat it too, or, in this case, scrumptious barbecue.

Alumni Events Calendar

- MAY 16-18, 2014**
Commencement Ceremonies:
Friday, May 16 – University Commencement
Saturday, May 17 – College of Natural Resources and Environment Graduation Exercises
Sunday, May 18 – National Capital Region Commencement
vt.edu/commencement/
- MAY 18-22, 2014**
Association of Natural Resources Extension Professionals
9th Biennial Conference
Sacramento, Calif.
ucanr.edu/sites/ANREP
- JUNE 3-6, 2014**
National Conference of Private Forest Landowners
New Orleans, La.
forestlandowners.com
- JULY 8-11, 2014**
Resource Modeling Association World Conference
Vilnius, Lithuania
resourcemodeling.org
- JULY 28-AUGUST 1, 2014**
Conference on Ecological and Ecosystem Restoration
New Orleans, La.
conference.ifas.ufl.edu/CEER2014
- AUGUST 10-13, 2014**
Forest Products Society 68th International Convention
Quebec City, Canada
forestprod.org/ic
- AUGUST 17-21, 2014**
American Fisheries Society 144th Annual Meeting
Quebec City, Canada
afs2014.org
- SEPTEMBER 13, 2014**
Homecoming and Tailgate
Virginia Tech vs. East Carolina
Cheatham Hall, Blacksburg, Va.
alumni.vt.edu/reunion

IN MEMORIAM: John E. Green III

John E. Green III ('70 B.S. in forestry and wildlife) of Steinhatchee, Fla., passed away Jan. 25, 2014, at the age of 66. He is survived by his wife of 30 years, Betty Hamilton Green, two sons, and a daughter. Born in Norfolk, Va., Green attended Princess Anne High School before enrolling at Virginia Tech, where he became a member of Xi Sigma Pi, the forestry honor society, in 1969.

"John was an outstanding graduate, the type of individual that any program at Virginia Tech would take pride in claiming as a graduate," said John Hosner, retired director of the School of Forestry and Wildlife, which later became the college.

Following graduation, Green served two years in the Army. Later, he earned a business management certificate from Florida State

University, became a licensed professional captain through the U.S. Coast Guard, and held the position of director of the Florida Forestry Association for 11 years. Green owned Timberland Management & Investments and was also employed by The Buckeye Cellulose Corp., Procter & Gamble Cellulose Co., Foley Timber and Land Company, and Philip J. Moses & Company.

An exemplary outdoorsman, Green loved sailing most of all, often adventuring out in the open sea on his boat, "Journey."

Green included the college in his will and had requested that, in lieu of flowers, donations be made to the college in order to start an undergraduate scholarship program in his memory. Contact Emily Hutchins at ehutchins@vt.edu or 540-231-8859 for more information.



Haufler steps into two new roles

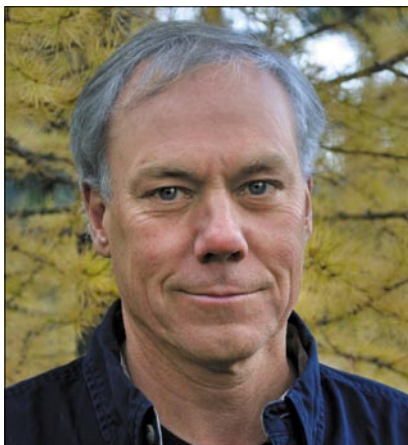


Photo by Carolyn Mehl

Jonathan Haufler ('76 M.S. in wildlife science) brings his diverse background to two new positions. He was elected to the board of directors of the nonprofit Sustainable Forestry Initiative (SFI) Inc. More than 240 million acres across the U.S. and Canada are certified to the SFI forest management standard, the largest single forest standard in the world.

"I've followed SFI as it grew into a highly credible system for assuring sound and publicly supported forest management," said Haufler. "I'm pleased to have this opportunity to assist in maintaining the quality and integrity of the SFI program as it continues to adapt and adjust to new information and new challenges."

Haufler is also current president of The Wildlife Society (TWS), an 11,000-member organization dedicated to excellence in wildlife stewardship through science and education. "I am honored to have this opportunity to serve as president and will be working closely with council, staff, and volunteers as we all work to keep TWS a premier professional society," he said.

With expertise in wildlife management, forest ecology, and range ecology, Haufler serves as executive director and co-founder of the nonprofit Ecosystem Management Research Institute, which provides planning assistance and technical support in ecosystem-based management, cumulative impact assessment, and biodiversity conservation at the landscape level. Among his previous positions, he managed wildlife and ecology programs for Boise Cascade Corp. and served on the faculty at Michigan State University for 13 years.

Scardina named Wayne National Forest supervisor

Tony Scardina ('04 M.S. in public administration and natural resource law and policy) is the new forest supervisor for the Wayne National Forest in southeastern Ohio. Scardina most recently served as the forest supervisor on the Ottawa National Forest in Michigan.

"I'm truly excited about getting to know the communities, ecosystems, and employees of the Wayne National Forest," Scardina said. His career began in 2004 when he worked in the Forest Service's Washington, D.C., budget office as a presidential management fellow in addition to serving as the travel management coordinator for the Eldorado National Forest in California. In 2006, Scardina was a deputy district ranger in California before accepting a position as a district ranger at Bradford Ranger District of the Allegheny National Forest in Pennsylvania.



Geography student puts heart and soul into library project



Mohamed Mwinyi fell in love with geography on his first day of third grade in Boko, a small town outside Dar Es Salaam in Tanzania. That day, he and his fellow students were introduced to their geography teacher, who instructed them to draw a map of the school. Mwinyi excelled at the task and hasn't looked back since. "Throughout primary and secondary school, I was always good at geography and loved it," he recalled. "I think that all things narrow down to my initial interest in geography."

Now majoring in geography at Virginia Tech after receiving his associate's degree from New River Community College, Mwinyi first came to the United States in January 2009 to pursue higher education. His aunt, who sponsored his journey to America, took him to a public library for the first time shortly after his arrival. He was astonished when the librarian explained that he could check out as many books as he wanted. In Boko, there was no library — the nearest one was an expensive, complicated, all-day bus trip away, and access to the books was very limited.

Inspired by his library visit, Mwinyi launched the Soma Sasa Program — a nonprofit organization seeking to provide literature and technology to Tanzania. *Soma sasa* means "to read" in Kiswahili, a Bantu language native to West Africa. The program's first goal is to build a library in Mwinyi's hometown of Boko.

Over the past two years, Mwinyi, with the help of a number of team members, has been gathering books, raising awareness, collecting funds, and planning the library's physical location. He envisions a facility that will be used both by students and their teachers. "It will be for anyone who wants to expand his or her horizons," he said.

On a return trip to Boko this past summer, Mwinyi was greeted by more than 400 students who cheered as he shared his vision for establishing the library. "It was amazing," Mwinyi remarked. "I never thought the idea would be received like this."

Mwinyi also met with government officials in Boko who were enthusiastic about the project. He now has the promise of a small room that will temporarily house the books until another facility is built. Teacher volunteers will organize and secure the books.

Meanwhile, Mwinyi is working out the details of a check-out system. "There will not be space to study, just to lend the books," he said, "but it is a start." Mwinyi and his team members are taking steps to register the project as a nongovernment organization and exploring ways to raise funds to improve the library's temporary location.

Last spring, Mwinyi received an Aspire! Award for embracing Virginia Tech's motto *Ut Prosim* (That I May Serve) as a way of life. Vice President for Student Affairs Patty Perillo cited Mwinyi's "caring nature, his ability to recognize a need and the courage to address it head-on, and his willingness to learn, grow, and contribute all he can."

Mwinyi also earned a spot in this year's cohort of students participating in the college's Leadership Institute. "What I like the most about the Leadership Institute is that, as we work on inventing our future at Virginia Tech, we're given the opportunity to clear the way and help people in disadvantaged communities so they can start their journey and invent their own future," he explained.

A group of the Leadership Institute students adopted Soma Sasa as their service learning project and have taken on leadership roles in the organization.

After graduation, Mwinyi would like to return to Tanzania to help his village and others across Africa use the continent's natural resources to strengthen economic conditions and improve the lives of citizens. "I would also like to teach so that I can have more opportunities, contribute a different perspective, and help promising students," he said.

Long gone are Mwinyi's days of drawing school maps by hand. "Today at Virginia Tech, I am working on spatial analysis for my hometown and the public library digitally," he remarked. "I have come very far."



A hero's welcome: Mohamed Mwinyi inspires the students in his home village in Tanzania.



Children at a nursery school in Tanzania surround Mwinyi during his visit last summer.

The Plaid Avenger (aka geography instructor John Boyer, center) enlisted students in his World Regions course to help with the project. In just three days, they donated 900 books. Martha Cecilia Montoya (left) was the program's secretary and helped collect books.



Mwinyi gets ready to transport books from his apartment to a storage facility.



Find out more about the Soma Sasa Program at somasasa.org or [facebook.com/SomaForTanzania](https://www.facebook.com/SomaForTanzania).

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