



# CNRE NEWS

ADVANCING THE SCIENCE OF SUSTAINABILITY

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## SUSTAINABILITY INSTITUTE

### Students connect classroom learning to real-world change

In the quiet of early January on campus, a group of undergraduate students got a head start wrestling with one of the weightiest challenges their generation will face: how to achieve sustainable growth in a globalized society and a changing climate.

The 30 students cut short their winter break to attend the first session offered by the college's Sustainability Institute. During the 10-day professional development training, the young leaders gained practical, hands-on experience with the systemic dilemmas they hope to take on in their careers.



*The training session included several group activities. In this exercise, students selected a well-known company, brainstormed about what they thought the company's most important environmental, social, and economic impacts are, and compared their results with what the company had reported publicly.*

"Sustainability is often tossed around as a buzzword, but it's not just a line on my resume anymore," said Carter Gresham, a senior majoring in landscape architecture. "This training helped me apply sustainability to my design background and ask how we can create buildings that can be retrofitted to be used for another 50 years."

The students participated in more than 60 hours of workshops and tackled case study challenges. Videoconferences and in-person sessions with sustainability professionals in government, the

private sector, and nonprofit organizations revealed a variety of potential career paths.

Students representing 20 majors across all seven academic colleges attended the training, which is open to undergraduates in any major. The interdisciplinary curriculum familiarized students in the arts, humanities, and sciences with the fundamentals of the marketplace and introduced business majors to a broader picture of corporate responsibility.

"Most of my classes focus on how to move up the corporate ladder and maximize profit," said Diana McDermott, a junior economics major. "The Sustainability Institute opened my eyes to the fact that corporate responsibility isn't just the drive to make as much profit as possible; it's the responsibility to create a better world."

"I'm a hardcore scientist, so I had no idea about business practices," said Naomi Rodman, a senior majoring in biochemistry and chemistry. "The institute showed me what interactions in a professional environment are supposed to be like."

"Sustainability is bigger than any one academic discipline," said Dean Paul Winistorfer. "With our college focus on advancing the science of sustainability, we've been considering the creation of such a student experience for several years and have finally brought it to reality. We've put real-world content and context into this experience for students. The Sustainability Institute can be a signature program for Virginia Tech."

Angie De Soto, the institute's director, spent 18 months consulting with more than 100 industry experts to determine which skills and concepts were most important for graduates entering the workforce to master. Using their insight, she developed the program's curriculum in collaboration with nine faculty fellows from across campus.



*The first training session offered by the Sustainability Institute included students from 20 different majors across campus.*

The program builds on the concepts students learn in their discipline-based courses. "The institute is successful because of the great content Virginia Tech's faculty already teach in the classroom," De Soto said. "Our goal is to connect sustainable systems to their fields of study and expose them to what these programs look like in the workplace."

"You can work on sustainability in any role at any organization," she continued. "It's how you approach and solve problems; it's not a word in your title. Young professionals who can problem solve with a 'sustainability lens' and explain the business case for doing so are highly attractive to employers."

The curriculum emphasizes what graduates can accomplish in entry-level positions because most "sustainability" jobs require many years of experience. Each company has its own approach to integrating sustainability, De Soto said, so new employees must examine how their organization operates and what issues are most material to them. Then they can frame proposals based on those priorities.

"My biggest takeaway was learning new language to make what's important to me seem important to people who don't have the same values," said Kylie Campbell, a sophomore majoring in water: resources, policy, and management. "I could spend as much time as I want doing research, but if I can't communicate what I'm learning and translate that into change, then it's not useful."

*(Continued on page 2)*



*During their trip to Richmond, students met with Bert Green, founder and CEO of SolarMill, to learn about his entrepreneurial journey to launch a solar-powered manufacturing facility. Here he explains his newest invention, which repurposes the lens from an old rear-projection television to use as a highly concentrated heat source.*



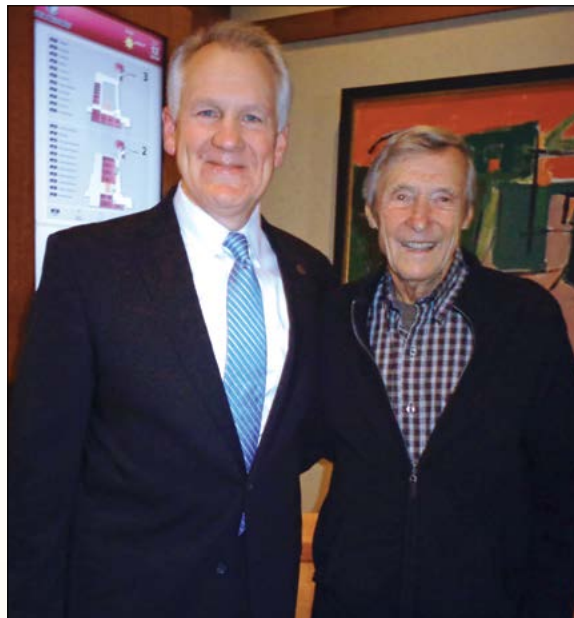


We are excited about our recently launched Sustainability Institute (see cover story), which will prepare students for future leadership roles. This experiential, workforce-development initiative links students to real-world sustainability challenges in the public and private sectors. Our first cohort of 30 students, representing diverse backgrounds, majors, and life experiences, were selected from all colleges at Virginia Tech, including our own. Blending students from different disciplines also allowed the students to learn from each other and gain new perspectives.

There is no one route to sustainability, as global resources are stretched to meet human needs. We need solutions rooted in science, but we also need to help students develop awareness and expertise in sustainability's social and economic issues. Sustainability is a grand challenge, and we can contribute toward solutions from all disciplines in the college and across campus. We hope this educational experience will not only differentiate our students in the marketplace but also equip them with a sustained differentiation in their careers as they work towards a sustainable future.

We held the first annual college Briefing Day in January, where we highlighted the work and contributions of many of our faculty in a daylong series of 20-minute presentations (see [cnre.vt.edu/briefingday](http://cnre.vt.edu/briefingday)). We plan to make this an annual event because learning about the work of our colleagues is the first step in building mutually collaborative teaching, research, and outreach programs.

We are actively participating in the broader discussions about the future of the university and of student education. Several of our faculty have been



Dean Paul Winistorfer (left) is joined by John Hosner, founder of what is now called the College of Natural Resources and Environment, at the college's annual honors banquet in April.

active participants in the Beyond Boundaries ([www.beyondboundaries.vt.edu](http://www.beyondboundaries.vt.edu)) initiative launched by President Sands, which includes the Destination Areas launched by Provost Rikakis. We are well positioned to contribute to the broader mission and initiatives of the university. The scholarship of our faculty is relevant now and, more importantly, as we move forward with new initiatives.

By the time you receive this issue we will have graduated the college's largest undergraduate class in recent history — more than 225 students. Applications for fall 2016 and offers of admission are both at record

highs, so we expect to enroll a larger, more diverse, and more academically qualified freshman class in August. We will be busy this summer with our annual cycle of renovations, classroom improvements, orientation, and the college leadership retreat.

Watch for information about our conference planned for October titled "Women in Natural Resources: Leading, Mentoring, and Connecting." It will bring a special focus to the contributions of women to our disciplines but also equip participants with skills to flourish in a multicultural work environment.

Finally, 2017 marks the 25th anniversary of the College of Natural Resources and Environment. Originally named the College of Forestry and Wildlife, we have evolved today to become one of the leading, comprehensive programs in North America and were named No. 1 by USA Today College Edition last year. Many of you contributed to the formation of our college, and many of you have been with us in the past 25 years. We plan to celebrate with a yearlong series of events. Stay tuned, planning is underway!

Have a great summer. Please stop by campus and the college if you are in the area. We'd love to see you and catch up.

Warm regards from our faculty, staff, and students,

Paul M. Winistorfer  
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Virginia Tech  
College of Natural Resources and Environment  
**CNRE to celebrate 25 years!**  
The year 2017 marks the 25th anniversary of the establishment of Virginia Tech's College of Natural Resources and Environment. Watch for details on events throughout 2017 to celebrate this milestone.

Women in Natural Resources  
*Leading, Mentoring, and Connecting*  
**Mark your calendar!**  
The college will host a conference to highlight the role of women in natural resources for the benefit of faculty, staff, students, alumni, and colleagues. "Women in Natural Resources: Leading, Mentoring, and Connecting" will take place Oct. 27-28 at the Inn at Virginia Tech. Visit [cnre.vt.edu/womensconf](http://cnre.vt.edu/womensconf) for updates throughout the summer.

## Students connect classroom learning (Continued from page 1)

After a full week of training in Blacksburg, the participants traveled to Richmond for three days of presentations, problem-solving exercises, and networking with nonprofit agencies and corporations, including Trane, SolarMill, Keep Virginia Beautiful, and Moseley Architects. There, students grappled with real-world challenges and presented their ideas to panels of sustainability professionals for critique.

"For a week, we'd been working on public speaking and formulating the best solutions to sustainability problems, and then we were being asked to do it in front of people well into their careers, so there was pressure," said Stephen Hong, a senior materials science and engineering major. "But I felt very prepared. It was valuable to be able to attack a problem immediately with people who were complete strangers just eight days prior."

Each participant is being paired with a mentor outside Virginia Tech to continue his or her professional development, and several students will work in paid internships with the institute's partner organizations. The program was offered free to students owing to generous donations from Trane, Luck Companies, and Virginia Tech alumnus Jeff Rudd. Sessions will be offered each summer and winter; the next session is scheduled for Aug. 8-19.

"As a design student, I'm part of an isolated group, so to be welcomed into this diverse program and work across disciplines was one of the more phenomenal experiences I've had at Virginia Tech," Gresham said. "I cannot stress enough how much I learned."

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## Schoenholtz attends White House Water Summit

The White House celebrated World Water Day on March 22 by hosting a Water Summit to bring the issues of water to the public forefront. Professor **Stephen Schoenholtz**, coordinator of Virginia Tech's new bachelor's degree in water: resources, policy, and management, was one of 150 participants selected to participate.

He presented Virginia Tech's commitment to water sustainability and security: "The newly established interdisciplinary undergraduate degree program in Water: Resources, Policy, and Management at Virginia Tech is designed to prepare students for rapidly expanding employment opportunities to address complex water-resources challenges for a sustainable and secure water future. Today, Virginia Tech is committing to expand this program by reaching enrollment exceeding 100 undergraduate students, increasing the program's endowment to \$2 million, and expanding by 2018 to include a graduate program offering M.S. and Ph.D. degrees for students seeking advanced interdisciplinary training."

The multi-faceted summit included a panel on the importance of agriculture and forestry in solving some of the nation's water problems, as well as a panel on integrated management of watersheds.

"With the current national spotlight on the water woes in Flint, Michigan, the water problems of our nation and around the world are at last on everyone's radar," Schoenholtz explained. "Citizens now know what scientists have been trying to tell policymakers for years — that the quantity and quality of our water can no longer be taken for granted anywhere on the globe. Flint's problems are our wake-up call, and the White House Water Summit is the catalyst for action and solutions for the spectrum of water challenges."

Dean Paul Winistorfer recognizes that the complexity of the world's water problems for a sustainable future needs an interdisciplinary approach, so he encouraged development of the new degree program that now encompasses faculty from five of Virginia Tech's eight colleges and is the first of its kind in the U.S.



*Stephen Schoenholtz represented Virginia Tech at the White House Water Summit.*

"The water degree prepares students for jobs with public agencies and nongovernmental organizations, as well as with architecture, urban planning, engineering, scientific, and technical consulting firms," said Schoenholtz, who also serves as director of the Virginia Water Resources Research Center, housed in the college.

## Virginia Tech hosts Landsat Science Team meeting



*The Landsat Science Team meeting offered graduate students and faculty the opportunity to network with leaders in the geospatial field.*

Scientists from around the world gathered on campus in January when Virginia Tech hosted a meeting of the Landsat Science Team. Made up of national and international leaders in Earth resource remote sensing, the team analyzes data collected by the succession of Landsat satellites that have orbited the Earth since 1972. The team also provides input on future missions and equipment.

Close to 70 people attended, including representatives from the European Space Agency, European Union, U.S. Geological Survey (USGS), Department of the Interior, NASA, Google, and National Geospatial-Intelligence Agency. "I think they really came away with a feeling of the richness of the depth and breadth of our remote sensing science here at Virginia Tech in terms of faculty, students, the library infrastructure, and the advanced research computing infrastructure," said Professor Randolph Wynne, a member of the team.

Select faculty and graduate students presented their research to the distinguished audience of international scientists. "The graduate students benefitted greatly from the experience and opportunity the meeting offered. They made an impression on people in the geospatial community who can make a difference — those who are filling positions or reviewing papers and proposals," Wynne explained.

As a joint initiative between the USGS and NASA, the Landsat Project and the data it collects support government, commercial, industrial, civilian, military, and educational communities throughout the U.S. and worldwide. "The goal of our research group at Virginia Tech is to improve our collective ability to monitor, model, and manage the Earth system — and, in particular, forest ecosystems — through improvements in both the preprocessing and analysis of Landsat data," Wynne concluded.

## Climate deal success in Paris just the beginning



*Carol Franco (second from right) and several other members of the Dominican Republic delegation with former Vice President Al Gore at the 2015 U.N. Climate Change Conference in Paris.*

Senior Research Associate **Carol Franco** has provided technical support for the Dominican Republic's delegation to international climate talks since the 2009 U.N. Climate Change Conference and attended meetings as a delegation member since the 2012 conference. Her focus has been on REDD+ and the financial mechanisms to support its implementation.

As a senior technical advisor for the Dominican Republic's National Council on Climate Change and its Ministry of Environment and Natural Resources, Franco was part of the team that developed the country's Intended Nationally Determined Contributions (INDCs). "The Dominican Republic's INDCs are conditional. We are already doing mitigation actions, but we will need funding for an additional 25 percent reduction in carbon emissions by 2030, which is the country's proposed target," she explained.

At the Paris meeting, Franco presented the adaptation component of the Dominican Republic's INDCs to a panel organized by the International Union for Conservation of Nature. "We included the ecosystem-based approach as part of our adaptation actions because it is the best way to holistically conserve and manage our ecosystems and ensure the Dominican Republic's adaptation to climate change," she said.

Back in Blacksburg, Franco has been successful in securing funding for the development of an international climate change program. She also is developing a course that will take Virginia Tech students to the Dominican Republic to learn on-the-ground implementation of mitigation and adaptation policies for climate change.

It took over a decade for the global framework called Reducing Emissions from Deforestation and Forest Degradation (REDD+) to become official. It was written into the Paris climate change agreement in 2015, with an explicit reference for the provision of financial support. Now a Department of Forest Resources and Environmental Conservation researcher is working to make it a reality.

## Developing relationship with Brazilian university opens up opportunities



*Professor Luiz Roberto Guimaraes Guilherme (left), vice director of the Office of International Affairs at UFLA, and Dean Paul Winistorfer sign the letter of intent.*

Brazil's Universidade Federal de Lavras (UFLA) signed a letter of intent with the college in January to facilitate future agreements for establishing an international exchange of faculty and students, research data, and development programs.

"They know of us, they know what we do, and they like what we do," said Professor Harold Burkhart, who has corresponded with the director of UFLA, a forest biometrician, for decades. "They think it would be mutually beneficial for us to work together." Burkhart traveled to UFLA last July to present a seminar to faculty and students, and met with officials in the university's international affairs office to discuss the idea of a more formal relationship.

"There's a lot of interest in the forestry program, but it's broader than that. They've got fisheries and wildlife, crops, soils, and they've done a lot of work in those areas," Burkhart said of the university, founded in 1909 as an agricultural school. The next step in the relationship will be to draft a memorandum of understanding to outline specific areas for collaboration.



## New CEARS leaders continue mission

**Valerie Thomas**, associate professor of forest remote sensing, and **Yang Shao**, assistant professor of geography, were named the new co-directors of the college's Center for Environmental Applications of Remote Sensing (CEARS) in December.

CEARS, which was named a NASA center of excellence in applications of remote sensing to regional and global integrated environmental assessments, was started 19 years ago by professors Randolph Wynne and Jim Campbell. "We needed an interdisciplinary approach to address grand challenges in Earth and environmental science," Wynne said. Campbell added, "We were already collaborating on instruction, but the center helped bring students together. We connected with other departments and planted seeds for more robust research activity."

After almost two decades at the helm, Wynne and Campbell welcomed the transition to new leadership for

the center. "Valerie Thomas and Yang Shao are coming into a program that is not only vibrant and strong, but was one of the early leading efforts on the campus to bridge disciplines in an effort to focus on Earth and environmental science," said Dean Paul Winistorfer.

The new co-directors will continue the center's strong research, education, and outreach programs, providing sound science for decision-making. Shao would like to increase collaboration inside and outside the college. "The Interdisciplinary Graduate Education Program can be a basis for expanding collaborations, such as with electrical and computer engineering, biological systems engineering, statistics, and Advanced Research Computing at Virginia Tech," he said.

Thomas looks forward to taking advantage of the advent of big data; a major upgrade in computers at the center will allow faculty and students to handle the huge amount



Valerie Thomas (left) and Yang Shao

of information now being provided. "Landsat satellite images and data are now free, exploding the scope of the science we can do and the kinds of questions we can ask to gain insight into ecosystem function and disturbance," Thomas said.

## Compacted soils can be rebuilt to help urban trees thrive



At a street tree planting site in Arlington County, Virginia, former master's student David Mitchell uses a specialized probe to extract a column of soil 1 meter deep. Soil carbon was analyzed at sites with and without remediation.

in untreated soil. "City soils are much maligned, and with good reason," she said. "They are stripped and compacted and mixed and layered until they have little in common with their less-disturbed cousins on agricultural and forested lands."

The Soil Profile Rebuilding method uses compost and a special subsoiling technique adapted for tight urban spaces to create pathways through the soil for root and water penetration. A backhoe is used to break up the compacted soil and incorporate compost to a depth of two feet. Then four inches of topsoil are applied and rototilled to a depth of 6 to 8 inches, followed by planting trees or shrubs whose roots help the soil continue to develop.

Unlike many previous approaches to alleviating soil compaction, the effects of Soil Profile Rebuilding persist "because the technique doesn't just break up the soil physically; it also affects biological activity in the soil," Day explained. It is a useful tool for designers seeking SITES® (Sustainable Sites Initiative) accreditation from the U.S. Green Building Council.

The rehabilitation process was developed over the course of seven years of research at Virginia Tech and in Arlington County, Virginia. Results were recently published in *Urban Forestry & Urban Greening*.

Researchers have developed a soil rehabilitation method that can help fix the compacted, rock-hard soils left behind after land development and building construction. Associate Professor **Susan Day** and colleagues showed that their method, "Soil Profile Rebuilding," decreases soil compaction, increases carbon sequestration, and increases the rate at which water moves through the soil, thereby improving storm-water capture.

According to Day, trees planted in rehabilitated soil have as much as 84 percent greater canopy than those

## Great Smokies course a memorable experience for students

A summer course in Great Smoky Mountains National Park provides students from Virginia Tech, the University of Georgia, and Purdue University with a unique education opportunity. Students, who stay at the park's Tremont Institute, take sessions on topics ranging from wildlife management to field journaling techniques.



The Great Smokies course offers students a fully immersive field experience.

Photo by Michael Williams

"Many students in traditional classes can go outside or go on two-hour field trips, but this is a weeklong immersive learning experience," said Professor Don Linzey, the lead instructor. "It allows them to explore more in depth in their field, investigate new topics, and come away with a number of life aspects of natural history in the Great Smoky Mountains."

New last year were a session on employment opportunities with the National Park Service and nonprofit organizations, and a presentation by a Cherokee guest speaker on the history of his people. Based on the positive student feedback, both sessions will be incorporated into this year's course, now in its 21st year.

"Best class experience I have ever had, and has helped facilitate new interest in wildlife conservation," a student said of the course, which Virginia Tech students may substitute for FIW 2324 (Wildlife Field Biology). "You'll take away more than you can imagine in such a short period of time. . . . It is an amazing experience that will open many doors for your future," another student advised.

Class instructors include Linzey, professors from Purdue and the University of Georgia, National Park Service personnel, wildlife biologists, Tremont Institute staff, and numerous guest speakers. For information on the 2016 session, beginning Aug. 3, email Don Linzey at [dlinzey@vt.edu](mailto:dlinzey@vt.edu).

## Hemp Road Trip stops on campus



A converted biodiesel minibus set off on a 35-state tour in January, launching the Hemp Road Trip, a nationwide campaign to bring attention to this beneficial yet controversial crop. Professor Tom Hammett arranged for the team's educational bus to stop in Blacksburg and welcomed hemp farmer Rick Trojan, one of the trip's four-person team, to present to his SBIO 3454 (Society, Sustainable Biomaterials, and Energy) class.

Trojan's talk included a brief overview of hemp as a crop, how it was used in our country's past, its recent resurgence, and some of its major uses. He also emphasized that the U.S. is the largest consumer worldwide of hemp, yet industrial hemp production has not been allowed in this country for over 60 years. The Hemp Road Trip seeks support for the passage of the Industrial Hemp Farming Act, which would remove all restrictions on the cultivation of industrial hemp and declassify it as a Schedule 1 Controlled Substance.

Students were invited to visit the bus, parked outside Cheatham Hall, to view displays and examples of hemp products, ranging from clothing to skin care products and even books printed on hemp paper. "As a sustainable biomaterial, hemp has the potential to protect our natural resources and reduce our use of fossil fuels, which will result in a significant reduction in carbon emissions, as well as protect our land, soil, and air," Hammett said.

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## Sophomore defends public health on Flint Water Study Team

The water crisis in Flint, Michigan, has attracted scientists from across the nation, most notably Virginia Tech's Professor Marc Edwards. He and the Virginia Tech Flint Water Study Team have been sending water testing kits, analyzing data, and issuing reports about the threat to public health from high lead and bacteria levels.



*Maggie Carolan met with dozens of residents on a trip to Flint, Michigan, in March with Virginia Tech's Flint Water Study Team.*

Sophomore **Maggie Carolan of Stafford, Virginia**, is advocating for the health of Flint residents. Carolan, a double major in geography and water: resources, policy, and management, joined the team as a participant in a National Science Foundation Research Experience for Undergraduates program in summer 2015 and continued pursuing research for honors credit during fall 2015. "I'm able to work with insightful research-minded people who are always thinking about questions that we need to ask in the face of ongoing problems, like what's going on in Flint," she said.

She assisted in the assembly of water testing kits, sent letters to Flint residents, processed samples, and participated in a presentation broadcast live from campus in January. In March, she served as a student leader for a spring break trip to Flint to collect and test water samples from residents' homes (see more at [www.vt.edu/flintwater](http://www.vt.edu/flintwater)).

"Everyone cares. I've seen everyone on my team emotionally drained from our involvement in Flint. It's so important to so many people," Carolan stressed. "Just being able to experience this and have that kind of role in someone's life is incredible. This is something I'll always look back on and think, 'I was someone who helped expose the problem to the public through the Flint Water Study.'"

During freshman year, Carolan worked with the Network Dynamics & Simulation Science Laboratory, translating data sets from Spanish to English for global population modeling, to be used in public health response inspired by the Ebola outbreak in 2014 and 2015. In addition to her work with on the water team, she now works as an undergraduate research assistant under Marc Edwards and is completing a research fellowship with a graduate student mentor in civil and environmental engineering, thanks to financial support from the Sustainable Water Undergraduate Research Fund, established by alumnus Jeff Rudd.

"I'm doing a project on rainwater harvesting system design and essentially characterizing the entire physical, chemical, and biological characteristics of rainwater harvesting systems," she said. "We have complete control

*Maggie Carolan tests water in a home in Flint.*

over the rainwater system of a home in Radford that's completely supplied by rainwater, so we've been sampling intensively there to understand water quality and how water quality is affected by climate and the environment."

Carolan enrolled in the new water: resources, policy, and management degree program to give her a unified framework for protecting public health through the lens of water. "When I came to Virginia Tech and found out about the water degree, I found that what was missing from my conversations on public health was the importance of water and sanitation for health in a global context," she explained. The degree's interdisciplinary coursework provides a unique combination of classes in science, engineering, and policy that Carolan finds important in preparing herself for current and future challenges in water infrastructure and quality, as seen in Flint, Michigan.



## Two students present research at 2016 T-Summit



*Christina Nelson (second from left), Emily Schlake (fourth from left), and fellow students, faculty, and a recent alumnus from the inVenTs community, with President Tim Sands (far right) at the T-Summit.*

Two students from the college were among the four Virginia Tech undergrads selected to present their work at the T-Summit in Washington, D.C.: **Christina Nelson of Purcellville, Virginia**, a sophomore majoring in wildlife conservation hoping to pursue a career in scientific illustration, and **Emily Schlake of Maidens, Virginia**, an aspiring zoo vet who is a junior double majoring in wildlife conservation and animal and poultry sciences.

The annual summit brings together leaders in higher education, industry, government, foundations, and professional associations to look at educational models that produce T-shaped students and professionals. The vertical line of the "T" looks at an individual's depth of knowledge in at least one discipline; the horizontal line looks at an individual's breadth and ability to collaborate across a variety of disciplines, as well as crosscutting skills such as communication, project management, and critical thinking.

Joining Nelson and Schlake in presenting at the summit were two fellow students and two faculty leaders from Virginia Tech's inVenTs Residential Community. InVenTs' four communities provide an interdisciplinary living-learning space for students from a wide variety of science and engineering disciplines interested in exploring their ability to envision, create, and transform innovative ideas into action. The residence hall features spaces dedicated to support discovery and creative activities of the students, including a state-of-the-art design lab.

"The living community has helped me to discover how I learn best," Nelson said. At the T-Summit she talked about her role in building a wheelchair cart for a paralyzed dog. "No other project impacted the way I view learning and leadership as this studio project did. I learned to be more open-minded and reach out beyond my comfort zone. And I now see problems as opportunities for creative solutions, not an insurmountable roadblock."

Schlake spoke about how she created a prosthetic device for two dogs and coordinated a team that built the prosthetic device. "This was a real-world application with multiple stakeholders with competing interests," she explained. "My biggest challenge was balancing the viewpoints, expectations, and timelines of the freshmen students, sophomore mentors, community directors, and the dog clients."

Both students are staying on next year as leaders in the living-learning community. Nelson said she loves continuing to live in inVenTs because she is able to put new students at ease and not be intimidated by the engineering-dominated environment. "Schlake made it comfortable for me, and now I am passing that on," she added.

President Tim Sands, who was the keynote speaker at the T-Summit, described how the university is modifying the T-shaped student model to a VT-shaped student, a model that brings in experiential and communal learning. He elaborated on ways educational institutions will have to adapt to prepare students for the future.

"We want to prepare students who can tackle complex global problems and opportunities," said Sands. "To do that, students need to be adaptable, resilient, and culturally competent, seeing the world through the lens of empathy and our university's motto, *Ut Prosim* (That I May Serve)."



## Wildlife Society student chapter earns multiple honors

*The Virginia Tech student chapter of The Wildlife Society was named Chapter of the Year by the society's Southeastern Section, earning a \$1,000 prize. Section President Eric Pelgren (left) presented the award to Virginia Tech student chapter members (front, left to right) Paige Crane, Christina Muehlbauer, Ally Moser, Erica Peyton, (back) Chris Rowe, and David Tilson at the annual meeting in November. In addition, the chapter's Quizbowl team took third place in the competition at the national meeting in Winnipeg, Manitoba, and first place at the Southeastern Wildlife Conclave in March.*

*Photo courtesy of Todd Leck*

# HNN

## Hokie Nation Network

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](http://alumni.vt.edu/hnn) to start networking today!





## Pathways Scholars announced

Two faculty members from the geography department — Assistant Professors **Tim Baird** and **Bob Oliver** — were among the eight selected as 2015 Pathways Faculty Scholars, a role that was initiated last year and is a vital part of the university's initiative to reinvent its general education curriculum. Over a two-year term, the scholars will be charged with designing and implementing pilot courses to meet the upcoming Pathways to General Education curriculum requirements. Some will redesign existing courses, while others will create entirely new courses.



*Bob Oliver (left) and Tim Baird*

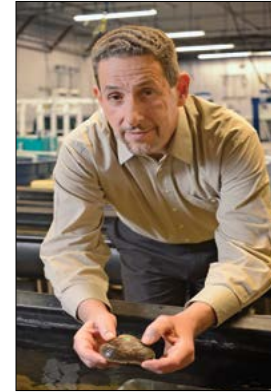
"The Pathways to General Education team selected scholars based on their goals for the position, their content areas, and their reputation for prior teaching innovation and excellence," said Stephen Biscotte, coordinator for General Education.

Those named as Pathways Scholars last year will position themselves as mentors and co-creators with this year's scholars. Both sets of scholars will meet with the Office of Undergraduate Education team and provide feedback and guidance during their term regarding the newly approved general education curriculum and the development of its implementation plan.

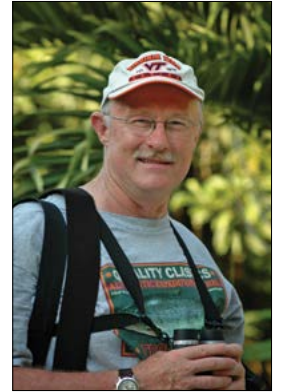
## Hallerman and Murphy named fisheries Fellows

Fisheries professors **Eric Hallerman** and **Brian Murphy** were among the honorees named to the inaugural class of Fellows by the American Fisheries Society, the world's oldest and largest organization promoting the scientific management of North American aquatic resources.

"The recognition of Dr. Hallerman's and Dr. Murphy's long-term commitment to the society and to undergraduate and graduate student involvement in it is reflected in their recognition as Fellows and as past recipients of the society's Excellence in Fisheries Education Award," said Joel Snodgrass, head of the Department of Fish and Wildlife Conservation. "Our students truly benefit from the leadership that both Hallerman and Murphy bring to the department and the discipline."



*Eric Hallerman*



*Brian Murphy*

Hallerman is a nationally recognized expert on fisheries and aquaculture genetics and has testified on Capitol Hill on the environmental safety and regulatory oversight of genetically modified salmon. He served as department head from 2006 to 2013, directed Virginia Tech's Horseshoe Crab Research Center, and is an affiliate of Virginia Tech's Fralin Life Science Institute.

Murphy, a Diggs Teaching Scholar and the recipient of several teaching awards, served as department head from 1994 to 1999. He is associate director of the Conservation Management Institute after having served as its founding director from 1999 to 2012. He is currently the Senior Faculty Fellow for Teaching and Learning for the college and an adjunct professor with the Chinese Academy of Science, Institute of Hydrology.

## CMI, Emrick recognized by the Army Reserves



The college's Conservation Management Institute (CMI) and Project Manager **Verl Emrick** received the "Patriotic Employer" award from the Employer Support of the Guard and Reserve, a U.S. Department of Defense office that promotes cooperation and understanding between Reserve Component Service members and their civilian employers. Project Assistant Matt Fields, a Reservist, nominated CMI and Emrick for the award for assisting him during his deployment and re-entry into civilian life. "I just wanted to thank CMI and Verl for supporting me and my family while I was deployed," Fields said.

*Verl Emrick (center) received the award from Command Master Sergeant Dennis Green (left). Matt Fields (right) nominated Emrick and CMI for the award.*

## Baird featured in National Geographic

Assistant Professor **Tim Baird's** work on the impacts of technology on a rural African culture was featured in National Geographic's March 2016. The article, "The Maasi: changed, for better or worse, by cell phones," appears in the issue's Field Notes section. Read more about his work at [tbaird007.wordpress.com](http://tbaird007.wordpress.com).



## Barrett receives SAF Young Forester Leadership Award

Assistant Professor **Scott Barrett** received the Society of American Foresters' 2015 Young Forester Leadership Award. Established in 1984, the award recognizes a young forestry professional's outstanding leadership supporting forestry and SAF, the world's largest professional society for foresters.



*Scott Barrett (right) provides overall leadership for the statewide SHARP Logger Program.*

Barrett coordinates the SHARP (Sustainable Harvesting and Resource Professional) Logger Program, which provides training to loggers, foresters, and others on the principles of sustainable forestry, workplace safety, and environmental protection. He provides overall leadership for the statewide program and works with Extension agents, volunteer leaders, and instructors to implement and evaluate training programs, develop new curriculum, and ensure a quality statewide training program. Over 3,500 people have completed the training since 1996.

A member of SAF since 2002, Barrett is currently serving his second term as chair of the Blue Ridge Chapter of the society's Virginia Division. He received the Young Forest Leadership Award from the society's Appalachian region before being recognized at the national level.

## IN MEMORIAM: Susan Brooker-Gross



**Susan R. Brooker-Gross**, 65, director of policy and communications for Virginia Tech's Division of Information Technology, died Jan. 2 due to complications after surgery. She was responsible for planning news and communications for the Division of Information Technology

as well as for developing many of the policies that govern the university's data access, maintenance, and security. Her sharp intellect and broad experience at

the university made her a valuable administration and planning asset for the division.

Brooker-Gross began at Virginia Tech in 1977 as an assistant professor of geography and became an associate professor in 1983. She served as department head from 1990 to 1993 before moving into an administrative role as associate provost for undergraduate programs. Her research centered on urban geography and explored the impact of gender, technology, and socioeconomic factors on human populations. "As one of our department's early faculty members, Susan was a major contributor to our growth and stature at the university," said Professor Jim Campbell. "She made numerous contributions to the field of urban geography and remained active in her field long after she served as department head."



## BETH INGALLS

## A lifetime legacy of service and giving

Alumna **Beth Ingalls** has spent her career “putting out fires,” using skills she developed as a student. And since earning her forestry degree in 1977, she has been giving to the college annually so others would have the same opportunities to learn the lifelong skills that make careers.

True, the “fires” Ingalls was putting out varied during her different jobs, but the skills she learned in the college applied across the board. One of her first jobs included keeping track of forest fires, which seemed a natural career given her education. She soon switched to human resources, where she helped resolve sometimes fiery personnel issues at a large company. Now she works with a financial consulting firm helping people plan for their future so they can avoid financial “fires.”

“One of the skills I learned at Virginia Tech was how to work with people, how to work collaboratively,” she said. Among her best experiences as a student was the four-week Forestry Spring Camp, where students and faculty from different programs within the college worked on forestry projects at a camp near Appomattox. “That experience of working with individuals with different interests and different points of view made a big impression on me,” she said. “We became a team.”

“I first learned how the university motto, *Ut Prosim* (That I May Serve), fit into my life in my involvement with student organizations,” said Ingalls, who was a member of the Forestry Club, the Society of American Foresters, and Xi Sigma Pi, the forestry honor society. She worked on projects with each organization to help others in both the college and the Blacksburg community. “I got to absorb the ethic of service,” she said.

Ingalls was one of the first women hired by the Tennessee Division of Forestry as a fire prevention forester, serving nine counties. After earning an MBA in management in 1983, she changed careers, joining the human resources



staff for The Hecht Co. chain of department stores, where she served for more than two decades. She is currently a branch office administrator with Edward Jones Investments in Catonsville, Maryland.

She has found ways to apply the spirit of *Ut Prosim* in each of her professional positions. In human resources, for example, she helped employees understand the company’s policies and benefits and how they best applied to each individual. “My job was to help them understand the benefits and costs so that if there was a problem — if a “fire” hit their lives — they had resources to turn to.”

Throughout her long and varied career, Ingalls has continued to donate to the college year after year, without fail. “It was more a matter of ‘of course, I give,’” she said, explaining that her family simply expected her to get an education and that giving back to the place that gave you the education is just what one does.

In addition, she is working to endow a scholarship targeted to transfer students in the Department of Forest Resources and Environmental Conservation for the same reason — to give opportunities to others. Ingalls has also made plans to support her scholarship endowment through a bequest.

“Beth’s annual gifts exemplify the great value to the college of regular support,” said Emily Hutchins, development director for the college. The endowed scholarship will add to Ingalls’ 40-year legacy of giving, in addition to support that will continue after her lifetime.



## Create a legacy for future generations

There are many ways your future gift to the College of Natural Resources and Environment can help you meet your individual needs as well as accomplish your charitable goal of supporting the college.

If you have already created a future gift for the college, please let us know so we can better understand, confidentially record, and one day implement your wishes. Knowing you have remembered the college through your will, trust, beneficiary designation, or other future support arrangement allows us to honor your generosity with membership in Virginia Tech’s Legacy Society.

Visit <http://bit.ly/vtgpform> to tell us about your future gift. To discuss giving to the college, contact Emily Hutchins at 540-231-8859 or [ehutch@vt.edu](mailto:ehutch@vt.edu).

## Obama honors Thorson as Presidential Early Career Scientist

President Obama recently named 105 independent researchers as recipients of the Presidential Early Career Awards for Scientists and Engineers, the highest honor given to researchers by the U.S. government in their early careers. Among the recipients is alumnus **James Thorson** ('09 M.S. fisheries and wildlife sciences), an operations research analyst at NOAA’s Northwest Fisheries Science Center, where he conducts research regarding state-of-the-art analytic approaches to theoretical and applied questions in marine population ecology.

“James, who majored in philosophy as an undergraduate, became an outstanding graduate student at Virginia Tech and pursued many interests in fisheries and aquatic science,” said Professor Don Orth, who served on Thorson’s graduate committee. “He developed and tested a number of innovative approaches to forecasting fish population trends.”



“I am incredibly flattered by the award, and happy to work at a governmental lab with talented and varied colleagues,” Thorson said. “We have unprecedented access to data globally, from individual to landscape scales. Perhaps my greatest pleasure in the award is that NOAA and the federal government recognize the value of broad, question-driven science that synthesizes information at different scales.”

## Alumni news online

We love hearing about the great things going on with our alumni, but we don’t have enough space in the newsmagazine to print them all. Catch up with former classmates and fellow Hokies online; scan the QR code or visit [cnre.vt.edu/tags/alumni.html](http://cnre.vt.edu/tags/alumni.html).

## Recent posts

J. Steve Carruth ('75 B.S.)  
Wayne Hubert ('79 Ph.D.)  
Barbara Knuth ('86 Ph.D.)  
Chris Kohler ('80 Ph.D.)  
Brigitte Orrick ('05 M.S.)  
Alexander Salenikovich ('00 Ph.D.)  
Trent Sutton ('97 Ph.D.)



## In memoriam:

Dock Atkinson ('79 B.S.)  
Denton Baumbarger ('77 B.S.)  
Howard Farrar ('52 B.S.)

## FACULTY BRIEFS (Continued from page 6)

## Fox named distinguished alumnus



**Thomas Fox**, the Honorable Garland Gray Professor of Forestry, has been named the 2016 Distinguished Alumnus by the University of Maine School of Forest Resources. Fox, who earned a bachelor’s in forestry from UMaine in 1980 and a certificate of advanced study in pulp and paper technology in 1981, was recognized for his career-long contributions to the field of forestry.

Fox serves as co-director of the Forest Productivity Cooperative and as the Virginia Tech site director for the National Science Foundation’s Center for Advanced Forestry Systems. The overall goal of his research and outreach program is to increase the productivity, sustainability, and profitability of managed forests in the U.S. and Latin America. In 2010 he was a Fulbright Scholar and visiting professor at Pontificia Universidad Catolica de Chile, where he worked on issues related to climate change and carbon sequestration.



## Save the date!

This year’s CNRE homecoming will take place when Virginia Tech defends the Commonwealth Cup against the University of Virginia to close out the 2016 football season. Mark your calendar for homecoming events on November 25-26 and visit [www.alumni.vt.edu/reunion](http://www.alumni.vt.edu/reunion) for updates.



# Alumnus rallies riparian restoration support for Stroubles Creek

Tom Saxton has planted a legacy made of trees, clean water, volunteerism, and science that will continue to grow and inspire for years to come. On a sunny Saturday in March, he looked on with satisfaction as over 100 student and community volunteers planted dozens of trees along Stroubles Creek on the outskirts of the Virginia Tech campus.



*Alumnus Tom Saxton continues to head the Stroubles Creek restoration project and returns to campus for planting events after having graduated in 2014.*

Photo by Amber Coeyman

Saxton, who earned his bachelor's in natural resource conservation, launched the Stroubles Creek Restoration Initiative as an Arbor Day project in his Urban Forest Management and Policy course shortly before graduating in spring 2014. He continues to manage the effort and has returned to campus for several planting events.

Like many suburban and urban waterways, Stroubles Creek suffers from numerous threats, including storm water runoff, which carries pollutants, bacteria, and sediment into the creek. As a result, the creek is listed as "impaired" according to state and federal standards.

According to Saxton, the best way to improve the creek is to restore its riparian ecosystem, the strip of vegetated land along the stream bank. "Riparian zones are important for many reasons — they improve water quality by absorbing pollutants and storm water runoff, decrease stream bank erosion, provide habitat and food for wildlife, cool the water for aquatic organisms that require

specific water temperatures, and provide aesthetic and psychological benefits for humans, just to name a few," he said.

To launch the effort, Saxton contacted university departments and facilities, and recruited friends and classmates. His goal — to plant 1,000 trees by 2020 — was ambitious. But in the project's first year alone, with 25 volunteers and generous university participation and encouragement, they planted more than 600 trees. After the March event and several smaller planting efforts, that total now exceeds 800.

"It's definitely been a success," he said. "We've had overwhelming support from every department at Virginia Tech we have approached." The college and Facilities' Site and Infrastructure Development provided funding for seedling trees. The Department of Horticulture provided large container-grown trees, and the Department of Biological Systems Engineering provided tree guards and tools. State agencies such as Virginia's Department of Forestry also donated seedlings.

Students in the Urban Forestry Management and Policy course Saxton took devote several lab periods to planting trees along the stream. Plans are underway for other forestry classes to join the effort next spring.

*Volunteers plant one of over 150 seedlings planted on March 26.*

Photo by Ann Beverley Prideax



"The biggest challenge was just the time involved," Saxton said. "Hundreds of hours were spent planning, researching, coordinating, and, then, actually planting the trees."

Recruiting friends and classmates to plan and plant, Saxton may have catalyzed the movement, he says, but each person is key. "This project has really been a collaborative effort; many hands have played a part in its success to date," he said. "As with many projects like this, it takes a diverse group of individuals to work together to achieve success."

While Saxton plans to return to campus during planting season each year, he is relying on current students to continue the effort and recruit volunteers. They have created the Stroubles Creek Restoration Initiative Facebook page to reach out via social media and have teamed up with student groups such as the American Water Resources Association at Virginia Tech.

Saxton is working to have the restoration area designated an official Riparian Conservation Zone by Virginia Tech and managed to protect it from future development. Additional efforts of the initiative include working with the Department of Biological



*Plastic sleeves help protect the seedlings from animals and harsh weather while allowing sunlight to penetrate.* Photo by Ann Beverley Prideax



*Watering is crucial to ensure that the young trees thrive. Signs encourage passersby to help with the effort.* Photo by Amber Coeyman



Systems Engineering's sTREAM Lab to improve livestock fencing around Stroubles Creek to limit cattle access and increase the riparian corridor, proposing several "no-mow" zones in areas near the stream to allow for native meadows to return, and promoting the installation of more effective rain gardens and permeable surfaces around campus and the town of Blacksburg.

"This project also has great potential to provide educational opportunities to students to learn about environmental issues and get involved," Saxton explained. "Our generation is tasked with solving challenging environmental problems. Our aim should be to think globally, while acting locally, and that is what we are striving for here at Virginia Tech."

Watch WDBJ's news story on the March planting event at <http://ow.ly/10keDo>.



Join us in Blacksburg for weekend programs and special events designed for Virginia Tech alumni, family, and friends.

Specially reduced lodging is available in The Inn at Virginia Tech.

Learn more at [www.alumni.vt.edu/events](http://www.alumni.vt.edu/events).

**Human and Animal Health: We're All in This Together**  
June 10-11, 2016

**4th Annual Hokie Classic Golf Tournament**  
June 13, 2016

**3rd Annual Summer Beer Festival at Virginia Tech**  
June 25, 2016

**A Day in the Life of College Admissions**  
July 8-9, 2016

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