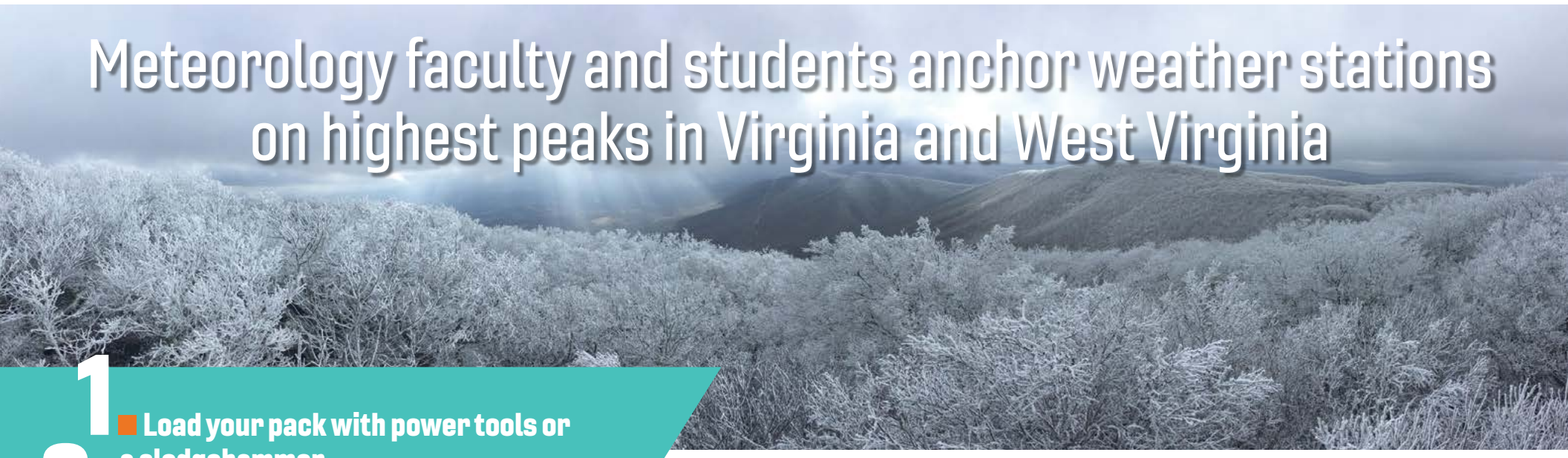
COLLEGE OF NATURAL RESOURCES AND ENVIRONMENT
VIRGINIA TECH™

Meteorology faculty and students anchor weather stations on highest peaks in Virginia and West Virginia



1. Load your pack with power tools or a sledgehammer.
2. Hike up Virginia's highest peak.
3. Get to work setting up and anchoring a weather monitoring station.
4. Then maybe enjoy the view.

Left: Instructor Dave Carroll (right) ensures that the student volunteers are involved in all aspects of the process of installing the weather stations. Right: Accessing the weather stations typically involves hiking up steep terrain in sometimes-challenging conditions.

It's just another day at the office for meteorology instructor Dave Carroll and his student volunteers, who have placed weather stations atop the highest mountains in Virginia and West Virginia to learn more about weather patterns at higher elevations.

The solar-powered, remotely accessed stations take readings every 10 minutes, collecting data such as temperature, wind speed, humidity, and rainfall, and then translate the data to a website, where visitors can learn the current conditions at Mt. Rogers or Bald Knob near Mountain Lake Resort in Virginia, or the five sites in West Virginia: Dolly Sods Wilderness, Canaan Valley National Wildlife Refuge (one on a peak and one in a valley), Bald Knob at Canaan Valley State Park, and Spruce Knob, the state's highest peak, in the Monongahela National Forest. An additional station on campus is used for student training purposes.

Carroll is already seeing a return on investment: "It has been interesting to observe weather conditions on these high peaks over the last few years, especially those areas where few longer term observations have been taken. We are learning things we never knew before."

One finding involves the temperatures on those peaks. Typically, the temperatures are comparable during times when a cold air mass is moving into the region. "However," Carroll explained, "latitude quickly takes over and temperatures on Virginia's rooftop warm significantly compared to those further north on Spruce Knob, where the cold air settles in for much longer periods. This effect is even noticeable between Mt. Rogers and Bald Knob outside of Blacksburg; Bald Knob stays colder for longer periods."

"The winds have been very surprising, too — how long they blow and at such velocity," added Carroll, who has observed winds blowing near 50 miles per hour for three days straight, and reaching 90 miles per hour during a 2018 nor'easter. Winds like these have toppled several stations and, along with a build-up of rime ice, snapped a tripod in two. Carroll has learned how to adjust the methods and materials for anchoring the stations to account for the extreme conditions.

Despite the challenge of packing all of the equipment to each site — sometimes going where there are no trails — Carroll usually has plenty of volunteers. "Employers are looking for graduates with these skills in addition to the classroom-based science aspects of meteorology," said Department of Geography Chair Tom Crawford, who adds that offering students hands-on instrumentation experience is an important part of the meteorology program.

Meteorology major Drew Shearer said, "I've learned more about the region and the difficulty in forecasting such a dynamic area." He believes that having this kind of field experience and seeing how data is obtained will help him understand why he's seeing certain kinds of data and make more accurate forecasts.

Visit bit.ly/2WkhBrD to view the data from any of the eight weather stations.

Fellow student Bradley Lamkin said, "This was an amazing experience! Installing the components helped me understand the data I was receiving from live reports." He did, however, share a downside to the experience — the weather. "The most challenging part was dealing with the harsh conditions at the summits. When we installed the station on Mt. Rogers, the temperature was in the mid-20s, and the winds were gusting up to 50 miles per hour."

Crawford added, "What Dave and his students have been able to do is really impressive. He has been building this monitoring network incrementally over the past several years, and it collects data for areas in Appalachia that aren't well covered by other monitoring systems."

Carroll echoed these thoughts and said of his aims for the ongoing project: "We want to fill in the data gaps for the National Weather Service. If they can get data from some of these places, it can be vital to them to know what's happening out there." It's also vital for saving lives. In spring 2018, thanks to rainfall data from Bald Knob near Blacksburg, the National Weather Service was able to issue an emergency flash flood warning.

Eventually, Carroll would like to have a dozen weather monitoring stations in place throughout the highest elevations in Virginia and the neighboring states, but this may take some time as the process for obtaining permits for placement on state and federal lands can be lengthy.

In the meantime, the winds continue to blow and the data continues to stream in.

"We are learning things we never knew before."

Students (left to right) Jon Martell, Cat Wilson, and Brad Lamkin donned snowshoes to access the Bald Knob station above Virginia's Mountain Lake in December. This station routinely records the coldest temperatures in the state through the winter months.

From the Dean's Perspective

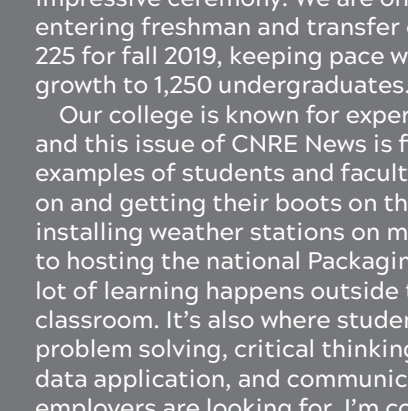
We enjoyed a successful commencement in May, graduating one of our largest classes ever – almost 250 students. Students and families filled Burruss auditorium, making it an impressive ceremony. We are on track to have an entering freshman and transfer class of about 225 for fall 2019, keeping pace with our planned growth to 1,250 undergraduates.

Our college is known for experiential learning, and this issue of CNRE News is filled with examples of students and faculty getting hands-on and getting their boots on the ground! From installing weather stations on mountaintops to hosting the national Packaging Jamboree, a lot of learning happens outside the traditional classroom. It's also where students learn the problem solving, critical thinking, teamwork, data application, and communication skills that employers are looking for. I'm confident that through traditional classroom learning and the wide range of experiences we have in the forests, fields, lakes, streams, mountaintops, and labs, our students are learning and preparing for success.

Our new director of employer relations is on board now, providing a critical link between our employer partners, students, and faculty. Through this position, we intend to gain a better understanding of employers' needs and link the pipeline of talent from the early stages of recruiting students all the way to successful employment upon graduation.

Thank you for your continued interest in and support of the college. Natural resources *and* human resources are needed to solve the big challenges that lie ahead – and we'll be supplying the leaders with the skills and the passion to make an impact.

Paul M. Winistorfer
Dean



You may have noticed that the CNRE newsmagazine is changing! We are continuing our efforts to transition to the new Virginia Tech brand and to provide content that is of interest and value to our readers. Thank you for your patience.

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Class of 2019 tree planting

This year's tree planting to commemorate the Class of 2019 took place during the Launch Party, an event to welcome graduating seniors into the Alumni Association. As is tradition, each department placed a memento in the planting hole. New this year — all trees planted around Cheatham Hall over the last 25 years have been identified with a stone marker and tag; each tag links to a tree profile page on **plantsmap.com.** Do you have photos of the tree planting from your graduation year? Please send them to **CNREadvancement@vt.edu** or share them on CNRE's social media feeds.

Giving Day 2019

Thanks to everyone who made Giving Day a success! Virginia Tech and CNRE increased both the amount raised and the number of donors over last year.

Virginia Tech		CNRE	
76%	39%	5%	5%
$2,863,031	6,674	$138,975	163

New director of employer relations

John Freeborn's first priority as CNRE's new director of employer relations is to hear from students, faculty, and employers so he can develop a strategy to better enhance relationships between Virginia Tech students and the industries eager to hire them. "I think the first step will be a lot of listening for me. I want to talk to employers and students to find out what their needs are, and then see how those two sides match up. I also want to utilize the strong relationships that faculty members already have with employers and industry."

This new position is part of the college's efforts to better link the forestry and forest products sector with Virginia Tech, community colleges, and high school students, fostering awareness of employment needs and opportunities in the sector and, ultimately, ensuring a sustainable forest industry in Virginia and beyond. Industry professionals interested in placing students in internships or partnering with the college in some other capacity can contact Freeborn at 540-231-1138 or freeborn@vt.edu. Read the full story: **bit.ly/2Eogey1**

Wildlife conservation students
take on real-world projects for capstone class

Three teams collaborated with the Virginia Department of Game and Inland Fisheries on its elk restoration program. Two examined GPS collar data to explore habitat use, while another distilled three months of live elk video into an educational highlight reel for the VDGIF website. Photo courtesy of VDGIF.

At the top of Buffalo Mountain outside Floyd, Virginia, a team of wildlife conservation students uses drones to map and monitor erosion impacts on the habitat of a rare insect. In Buchanan County, another team works with the Virginia Department of Game and Inland Fisheries to monitor and study GPS data for the state's wild elk population. Just west of the Virginia Tech campus, a third team is surveying invertebrates to make determinations about the ecological health of Stroubles Creek.

This is a sample of the work students are doing for their capstone class, a conservation biology course in the Department of Fish and Wildlife Conservation that asks seniors to synthesize what they've learned during their college career and apply that learning to real-time field projects.

The project-oriented focus is the brainchild of Professor Sarah Karpanty, who took over the course in 2014. "It used to be a more traditional lecture-based course," she explained. "We realized that the students felt, rightfully, that it wasn't functioning as a capstone of their studies. Now it is completely project-based from day one. We put a lot of emphasis on final career preparation and try to design projects and partnerships with agencies so that students are carrying to completion a project in a tightly packed 15 weeks."

Courtney Linkous, a member of the Buffalo Mountain team, says that the effort to align projects with a student's area of interest has been invaluable. "Dr. Karpanty works very hard to ensure that all of her students find a career-oriented project that fits their interests and helps them decide what they want to do in the future. She takes a lot of time to work with each group, going out to projects with us."

Erin Saylor, whose team is researching elk habitat availability, says that the capstone experience echoes the careers wildlife conservationists will pursue. "What I appreciate about the capstone class is how it mimics a work setting, where you have projects thrown at you. You're given resources and a task to take on, but you have to figure it out for yourself."

Karpanty says that the emphasis on experiential learning is particularly valuable for students entering the workforce in the age of smartphones and other digital technologies. "For this generation of students, accessing knowledge isn't a limiting factor. We have knowledge at our fingertips all the time. What this course offers is the chance to organize and synthesize and apply that knowledge. The experience students have is what they will be doing throughout their careers: taking a base of information and applying it to real-world problems. That's what we're trying to replicate in this course."

For Karpanty, the course gives her a chance to work with students in the field and cultivate partnerships with colleagues and employers near Virginia Tech. "A lot of my research is on the U.S. coast and in Madagascar, so I don't get many students to come out there," she explained. "What's exciting about the capstone class is that it gives me the chance to work in the field with these students and develop partnerships with organizations in the New River Valley. I feel like the students are making a tangible impact on this region, and I really appreciate the opportunity to work with them on local projects."

In collaboration with Roanoke City Parks and Recreation and Mill Mountain Zoo, students surveyed mammals, reptiles, and amphibians in Mill Mountain Park. Photo courtesy of Heather Rousseau, Roanoke Times.

"We put a lot of emphasis on final career preparation and try to design projects and partnerships with agencies so that students are carrying to completion a project in a tightly packed 15 weeks."

(Left): Students surveyed invertebrates to indicate stream quality as part of several efforts with the Stroubles Creek Restoration Initiative. (Right): Professor Emeritus Brian Murphy's 67-acre property in Newport, Virginia, served as the site for four teams working on different aspects of wildlife habitat improvement. These students developed a timber stand improvement plan to benefit white-tailed deer.

Appalachian forests: The new proving ground for fire

"Controlled burns allow us to return the forests to a balance

In a hilltop meadow in Virginia Tech's Fishburn Forest, forestry major Molly Hunt tilts a drip torch. Inside the canister a liquid mixture of gasoline and diesel fuel shifts forward and siphons down, making a full circle around the fuel trap loop before reaching the lit wick. Then she begins to pour fire.

On the other side of the ridge, fellow student Emily Newcombe lights a parallel line. The radio on Newcombe's shoulder directs her movements to coordinate with others on the crew. At the perimeter of the burn, students and members of the Virginia Department of Forestry stand guard with metal rakes and shovels ready to prevent any wayward sparks from crossing the fire line.

The fire starts small, consuming wisps of dried grass and fallen leaves. As the flames grow, they burn branches and singe the lower bark of trees. Narrow saplings "torch" — a term foresters use to describe an entire tree engulfed in fire. As the fire strengthens, flames climb 10, then 20 feet high. In the branches above, pinecones hiss and then catch, brief bursts of yellow against a gray sky.

This is a work day for Hunt and Newcombe, students in the Department of Forest Resources and Environmental Conservation's Wildland Fire: Ecology and Management course. Today's assignment: a prescribed burn.

A history of fire

Adam Coates, assistant professor of forest fire ecology and management, says that fire has always played a role in the forest ecology of Southwest Virginia. "If you look back on the history of our forests, fire has been a natural part of a forest's life," Coates explained. "Many older trees have been harvested to expose their annual growth rings. Often, you can see in the rings when fire events happened."

Coates notes that increased development and, particularly, the movement toward urban living have motivated people to prevent naturally occurring fires in order to protect people and property. "As a result, we have forests that have large accumulations of fuel in places where a long time ago fire would have burned off that excess. Controlled burns allow us to return the forests to a balance that once occurred naturally, while making sure that wildfire can't reach where people live."

Coates says that the forests of Appalachia, less studied than drier landscapes, present compelling new areas of research related to fire use and prevention. "We've gone so long without fire being prevalent on the landscape that it's really hard to put fire back and expect it to do what we think it did a long time ago. To some degree, we have novel forests now. We took fire away and in doing that we've changed the dynamics of our forests. So trying to put it back is a complicated and challenging process."

Preparing to light

Prescribed fires are not fitted for every part of our current landscapes. Some areas have gone extended periods without fire, and other management activities might be needed before prescribed fire can be considered as an option. Careful consideration and planning is part of prescribed fire operations, long before the first flame is ignited.

On the day of the prescribed burn, the first stage on the ground typically involves shovels and rakes, but — if one is lucky and terrain permits it — preparations might include a bulldozer. "Once we determine the general area we want to burn, we construct a boundary around it," Coates said. "The key is to remove any potential fuel from the line so the fire can't cross."

For the 11-acre burn conducted last fall to enhance wildlife habitat, the crew used heavy machinery to dig a portion of the fire break. Students helped complete the perimeter using metal rakes and leaf blowers. Everyone on site dons personal protective equipment: fire-resistant clothing, work gloves, fire-resistant boots with 8-inch tops and Vibram soles, and hard hats.

Students Molly Hunt (left) and Emily Newcombe use leaf blowers to clear the fire line of any loose debris in advance of the prescribed burn. The wildland fire course inspired Hunt to join the New River Valley Wildland Fire Crew. Newcombe spent the summer of 2018 on a wildland fire crew based in Idaho.

A pre-burn briefing is a critical part of any prescribed burn. Here, Assistant Professor Adam Coates (far left) tells crew members about the educational aspects of the burn before turning the briefing over to Joe Boswell (second from right) of the Virginia Department of Forestry, who assigned tasks and reviewed safety measures.

The terrain at Fishburn Forest was suitable for us fire line.

ecology teaching and research

that once occurred naturally, while making sure that wildfire can't reach where people live."

During the fire, the fire crew studies the movement of the smoke and monitors the perimeter to confirm no sparks have crossed the divide into the wider forest. Once the fire is out, they march onto the blackened landscape, using rakes to check the ash layer for dormant hotspots and taking measurements of the depth of the burn in the layers of soil. They also check tree stumps for any fire held in the catchment and pour cold ash and dirt over the heat to fully exhaust the fire.

From the classroom to the forest

Across the U.S., few universities employ faculty dedicated to teaching and researching fire ecology. Coates' position reflects the college's commitment to studying the role that fire plays as a tool for foresters and as a naturally occurring event that demands preparedness. The availability of A fire expert on campus also broadens research opportunities for other faculty members.

"We have some really terrific, highly specialized faculty here," Coates said, "and having a designated 'fire guy' like me, someone who can put fire on the ground and study the energy being produced by it, creates unique opportunities for collaboration. We can better understand how fire might affect soil or water, for example. This helps us fit both prescribed fires and unplanned wildfires into the broader context of forest management."

According to Coates, climate change has increased the urgency for studying forest fires. "Only three ingredients are needed to create flames: heat, oxygen, and fuel. When we receive abundant rainfall, vegetation responds with new growth. If we have extended periods of dry weather after that abundant new growth has occurred, that vegetation becomes dry and easier to ignite."

"Under these conditions, all it takes is one major wind or storm event, or someone being careless or malicious with fire, and the results are these seemingly anomalous wildfires," he continued. "We're seeing rising temperatures and changes in the dynamics of moisture, and we've got to get a grasp on how these events occur so we can make efforts to prevent them, or at least minimize potential damage for people and their property."

Education is also essential. Coates intends to work with communities across the region through the Firewise USA program, aimed at educating residents in suburban and developing areas on how to build houses and maintain properties in ways that reduce fire risk.

He also hopes to develop a designated center for fire research. "I have an infrared camera and numerous devices that measure heat, and we're able to use all of these tools to conduct research in the field, but we don't have a centralized burning chamber or table experiment space to take smaller amounts of material and run research. It'd be great to be able to manipulate variables in a controlled setting and create certain types of fires with specific vegetation under specific environments and measure how they burn. We've talked about developing a facility where we could do that type of research with a high level of accuracy. That's the next step."

'That's when you know you got 'em'

Conducting a burn with the Virginia Department of Forestry gives students one-on-one time with professionals, transfers classroom learning to the field, and creates an experience that helps bring a new generation of foresters to the field.

"We ask the students to tell us what they're seeing as the burn is happening," Coates explained. "Afterwards they'll start to make inferences from the experience. And because each fire is such a unique event, we're asking them to be scientists during the event, to be the ones asking the questions and working out the answers.

"It's perfect on-the-job training," he continued. "The work of conducting a burn briefing, laying out the objectives, and doing the preparation is what the students are going to wind up doing when they're on a job. You can see their faces light up with excitement about the work we're doing, and that's when you know you've got 'em. That's when you know they're hooked."

sing a bulldozer to cut a well-defined

Emily Newcombe uses a drip torch to ignite brush along the established fire line.

Student Cain Harbison and other crew members patrol the fire line with shovels and rakes to ensure that no flames or embers escape the established perimeter.

Students lead effort to host the national 2019 Packaging Jamboree

The 2019 national Packaging Jamboree welcomed almost 100 students from six universities as well as 50 industry professionals representing 20 companies. Hosted at Virginia Tech by the Packaging Systems and Design Club, the event took about 10 months to plan. "Without the 23 dedicated and passionate student volunteers, this event wouldn't have happened," said Assistant Professor Young-Teck Kim.

At the event, which was the largest in recent years, industry representatives gave presentations about emerging technology and trends in e-commerce packaging and innovation. During breakout sessions, students from different schools worked on teams to develop solutions to case studies provided by industry members. They then pitched their ideas to the companies and were awarded points based on creativity, feasibility, and accuracy to the actual solutions. Students also attended a career fair to facilitate conversations with potential employers, including Merck, Nestle, Newell Brands, and the Packaging Corporation of America. The career fair was such a success that Virginia Tech's packaging systems and design program plans to host its own career fair in 2020 to better connect students with employers in the industry.

Virginia Tech student Ryan Carter (second from left) and team members from other universities work together to solve an industry case study during the Packaging Jamboree.

Hands-on learning in action

Check out the following videos about students gaining valuable hands-on experience.

Wood Enterprise Institute students learn entrepreneurial skills as they design, produce, and market this year's wood-based product: **bit.ly/2vPGVqA**

Students in the Field Experiences in Forest Resources and Environmental Conservation course test their classroom knowledge to survey tract boundaries: **bit.ly/2HaPFgs**

Outstanding graduate students

Master's student: **Katie McBaine**
Fisheries and Wildlife Sciences

Research focus: I study populations of the federally endangered candy darter — a small, brightly colored freshwater fish — in Virginia. Specifically, my research focuses on estimating survival rates and population sizes, estimating within-stream movement, measuring genetic diversity, and characterizing habitats where the species occurs. Results of my research will enhance our understanding of the dynamics and genetic structure of these populations, which will allow us to identify ways to manage populations and inform potential conservation actions such as translocation and reintroduction.

Doctoral student: **Sydney Hope**
Fisheries and Wildlife Sciences

Research focus: I study how environmental changes influence animal parental care behavior and how this affects developing offspring. Specifically, I focus on egg incubation in birds. Many types of disturbances (changing climate, extreme weather, human development) affect the ability of a parent bird to warm their eggs during incubation, and small changes in temperature can have large effects on offspring. One of my major findings is that a small decrease in average incubation temperature negatively affects the ability of wood duck ducklings to exit their nest once they hatch, which is necessary for survival.

Outstanding seniors

Deirdre Conroy
Department of Fish and Wildlife Conservation

Deirdre Conroy, **CNRE's 2019 Outstanding Senior**, combines her passion for social justice with a deep commitment to conservation. "For me, conservation boils down to addressing human needs … in a sustainable and ecologically sound way." Conroy's vast array of educational experiences have taken her from researching bat species diversity in the forests of Virginia to studying the impact of sustainable logging techniques on jaguars in Belize. "What I've realized through my experiences is that it's the socio-environmental issues that I care most deeply about."
Full story: **bit.ly/2HmWKKR**

Erin Lash
Department of Sustainable Biomaterials

Erin Lash's path didn't follow the route she initially planned, diverging from engineering to sustainable biomaterials. "I wanted to do something with an environmental focus. You get a strong science background, but you're also exposed to the engineering and business elements of the field." Lash applied that diversity of skills to an internship with an environmental consulting firm, a leadership role in the Wood Enterprise Institute, and a transformational study abroad experience in Costa Rica. Full story: **bit.ly/2LRkufM**

Laura Puckett
Department of Forest Resources and Environmental Conservation

Whether she is hiking a 1,000-mile stretch of the Appalachian Trail or setting the standard for future environmental informatics majors, Laura Puckett is a trailblazer. Excelling in the discipline calls for an aptitude for using quantitative tools to unlock new information about ecosystems and environmental changes — as well as a passion for protecting and preserving our natural resources. "The reason I'm on this career path is because I care about understanding and protecting the natural world." Full story: **bit.ly/2LRk214**

Neil Schubel
Department of Geography

Neil Schubel has merged his interest in the natural world with human dimensions of geographic science both inside and outside of the classroom. "I chose geography because it has environmental aspects, but it also has the human geography side as well." As a member of the Virginia Tech Corps of Cadets, Schubel participated in overseas programs in Oman and Sri Lanka, offering him opportunities to broaden his experience of the world. Schubel will join the Army's Military Intelligence branch after graduation. Full story: **bit.ly/2E7zPCs**

Recent Alumni Award

Recent Alumni Award recipient **Danielle Gift** ('09 M.S. forestry and forest products) has spent 10 years with the New York City Department of Parks and Recreation, in a variety of roles. She is currently the senior project manager for Tree Preservation, responsible for initiating and overseeing several programs, including pest and disease management, storm response planning, and tree restitution and replacement.

Mentoring and networking are important components of Gift's career. By staying engaged with the Virginia Tech community, she learns about current research and can apply it to her day-to-day work. She maintains a great relationship with her faculty advisor, Associate Professor Eric Wiseman, and shares guidance and advice to students about being an urban forester. There are currently two Hokies employed in Gift's office, and she looks to hire more.

Gift also dedicates time to urban and community forestry professional councils and organizations. She serves on the board of directors for the New York State Urban Forestry Council, works with the Society of Municipal Arborists' Membership Committee, participates with the Urban Ecology Collaborative, and contributes to the Region 2 (NYC) ReLeaf workshop committee.

"I am honored and completely humbled to receive this award," Gift said. "I'm so excited to share this honor with my mom, the original influencer in my life, and with my dad, who would've been so proud of me."

Meteorology students in high demand as Air Force weather officers

The U.S. Air Force expects to commission just 30 weather officers from the 1,900 students finishing ROTC programs this year — 25% of them from Virginia Tech, more than any other university.

So when 1st Lt. Daniel Katuzienski ('15 B.S. meteorology), now a master's student at the Air Force Institute of Technology, needed help crunching the data for his research project on developing radar forecasting techniques to better predict and mitigate lightning impacts on Air Force Space missions, he knew exactly where to turn.

Cadet Mason Sorrell, a senior meteorology major who volunteered for the internship position with Katuzienski before knowing that they had friends in common and attended the same high school, says the internship was good practice for his military career. And Katuzienski reports that Sorrell's help got him several months ahead of schedule.

According to Lt. Col. Barry Burton, an instructor with Virginia Tech's Air Force ROTC, although the Air Force is short on flying-related officers, cadets with a meteorology degree can't compete for those slots because there is such a critical need for weather officers. Burton wants to strengthen the relationship between Virginia Tech, Air Force operational weather agencies, and the Air Force Institute of Technology by increasing the internship opportunities available for cadets.

Sorrel has since commissioned into the Air Force and is undergoing training to become a weather officer at Barksdale Air Force Base in Shreveport, Louisiana, where he will do forecasting work. Read the full story: **bit.ly/2WiaGjz**

Cadet Mason Sorrell (right) completed an internship with Virginia Tech alumnus 1st Lt. Daniel Katuzienski (left) at the Air Force Institute of Technology.

Faculty awards and honors

- **W. Michael Aust** of the Department of Forest Resources and Environmental Conservation has been named the Honorable Garland Gray Professor of Forestry.
- **Jeff Marion,** adjunct professor in the Department of Forest Resources and Environmental Conservation, received the George Wright Society's 2019 Natural Resources Achievement Award.
- **Michelle Prysby,** director of the Virginia Master Naturalists Program, received the McCarthy Award from the Virginia Natural Resources Leadership Institute.
- **Dean Stauffer,** professor in the Department of Fish and Wildlife Conservation, received the Honor Alumni Award from the University of Idaho.
- **Faculty members honored with emeritus status:**

  Susan Day, associate professor in the Department of Forest Resources and Environmental Conservation

  Thomas Fox, professor in the Department of Forest Resources and Environmental Conservation

  Brian Murphy, professor in the Department of Fish and Wildlife Conservation

Upcoming CNRE events

WELCOME BACK PICNIC
Thursday, Sept. 5
Holtzman Alumni Center
cnre.vt.edu/getinvolved
Sept. 5

CAREER FAIR
Thursday, Sept. 19
Cassell Coliseum
cnre.vt.edu/careerfair
Sept. 19

HOMECOMING TAILGATE
Saturday, Oct. 19
Holtzman Alumni Center
cnre.vt.edu/getinvolved
Oct. 19

News from around CNRE

Putting new environmental monitoring system to the test

Faculty in the Department of Forest Resources and Environmental Conservation are helping test a new integrated environmental quality sensing system, called Envōk — a user-deployed network comprised of wireless microprocessing nodes capable of connecting to a wide range of environmental sensors. At the test site along Stroubles Creek, sensors measure water levels, soil dynamics, carbon fluxes, and stream conditions. Researchers are testing the hardware and durability of the system, the communication capabilities between nodes and to the server, and real-time adjustments to sensor measurements that would allow for adaptive modeling and data analysis. They are also making recommendations to the manufacturer, Innovative Wireless Technologies, ranging from software design and installation options to what kind of outputs and sensors are more useful in field applications. A second test site has been installed at the Pacific Northwest National Lab as part of the ongoing collaboration with the manufacturer and the U.S. Department of Energy. Read the full story: **bit.ly/2LI97qe**

Photo by Cynthia Raught

How does feeding birds influence people?

Assistant Professor Ashley Dayer of the Department of Fish and Wildlife Conservation collaborated on a study about the behavior of people who feed birds, one of the most common forms of interaction with wildlife around the world. Using a survey of 1,176 people who feed birds and record their observations in the Project FeederWatch database, the researchers found that most people noticed natural changes in their backyards that could be due to feeding, including an increase in the number of birds at their feeders, a cat or hawk near their feeders, or a sick bird at their feeders. One surprising result was that when deciding how much to feed birds, people prioritized natural factors, such as cold weather, more than time and money. "Overall, our results suggest that people who feed birds observe aspects of nature and respond in ways that may affect outcomes of feeding on wild birds," Dayer said. Full story: **bit.ly/2HknqwY**

Working to preserve the treasure of Hawaii's forests

Professor Emeritus Marshall White and Research Scientist Zhangjing Chen of the Department of Sustainable Biomaterials have modified their proven steam-and-vacuum treatment method in an effort to help save Hawaii's forests. The ʻōhi a ́ tree — a Hawaiian cultural, environmental, and economic treasure — is under threat from a fungal pathogen that can kill an 80-foot giant in a matter of days. Fallen trees can't be moved for fear of spreading the pathogen. White and Chen have been researching steam-and-vacuum processes for killing insect and fungal invaders in wood materials as an alternative to methyl bromide treatment for the past five years. They put a portable vacuum chamber inside a 20-foot car trailer, drove it to the west coast, and shipped it by boat to Hawaii for onsite testing. The fact that the chamber is portable is an added benefit, since it can reach infected trees in forested areas. Testing enabled them to find the best combination of temperature and time in the chamber to destroy the fungus. Full story: **bit.ly/2JCYGl2**

Botswana president and first lady visit CARACAL

Botswana President Mokgweetsi Masisi and first lady Neo Masisi visited Professor Kathleen Alexander's research program at the Centre for Conservation of African Resources: Animals, Communities, and Land Use (CARACAL) in northern Botswana. They toured the organization's 42-acre site and met with research staff, educators, and animal care personnel to discuss the program's focus on improving health outcomes and livelihoods of communities and sustainably managing the natural ecosystems on which they depend. While CARACAL does extensive work in wildlife research and rescue, the president and first lady expressed particular interest in the CARACAL and Virginia Tech projects aimed at addressing rural poverty and the challenges of educational access for young people in Botswana. Full story: **bit.ly/2VrtFmi**

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