Forestry

leader in excellence.....

Spring 2021

Nizhoni Tallas, pictured during a Forest Ecology and Silvics lab in fall 2020, received the College of Natural Resources and Environment's 2021 David Wm. Smith Leadership Award. Photo by Krista Timney, Virginia Tech.

NEWS INSIDE

COLLEGE OF NATURAL RESOURCES AND ENVIRONMENT
FOREST RESOURCES AND ENVIRONMENTAL CONSERVATION
VIRGINIA TECH

Class of 2021: Connecting with Indigenous groups defines one Hokie's leadership journey

After growing up in the Navajo Nation in northern Arizona, FREC senior and natural resources conservation major **Nizhoni Tallas** knew that coming to Virginia Tech would mean leaving the familiar behind. What she did not expect was that becoming a Hokie would mean collaborating with Indigenous communities on issues of natural resources management.

"I've learned that there's not just one path to knowledge," said Tallas, the 2021 recipient of the David Wm. Smith Leadership Award. "I'm grateful to have had the chance to dive into projects and connect to so many people and communities."

Tallas' interest in work with Indigenous groups to find innovative ways to share traditional knowledge while honoring cultures has spanned the country and reached across the globe.

From researching the cultural significance and current decline of Manoomin (a traditional wild rice) crops at the University of Minnesota, to studying water resource challenges for Virginia tribal communities as an intern for the Virginia Water Resources Research Center, to learning about traditional practices with members of the Sámi people of northern Norway, Tallas has seen the diversity of Indigenous communities and some of the foundational values that they share firsthand.

"Having the chance to visit the Sámi and learn about their culture was incredible," said Tallas, a member of the Diné tribe. "They took me on a tour of their community and shared their practices of herding reindeer, and I shared about my community in Arizona. It was a powerful experience that really

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FROM THE DEPARTMENT HEAD


Jay Sullivan

As we emerge from difficult circumstances that we hope are now behind us, it would be easy for us to just look back to what we were before the recent situation befell us. However, we all face a world that is different from the one we knew just a few months prior, and we would not be doing anyone a favor if we did not continue to look forward and consider the emerging trends that will reshape our profession, our curriculum, and our way of doing business. Some examples on our radar include the demographic realities we face, unprecedented public interest in environment and climate, and continually increased reliance on data and technology.

The demographics of potential students, the workforce in private and public positions in the field, and landowners and so many others we serve will have an impact on our recruiting, our curriculum offerings, and our extension/outreach programs. Our ever-more diverse population is concerned with issues of diversity, equity, and inclusion, and though we have made gains, we have much more progress to make in our program and profession. Declining U.S. college enrollment will force us to continually reassess our competitiveness in providing the highest quality in affordable and accessible educational opportunities to recruit successfully and provide graduates to fill the many positions now opening as my generation retires from the workforce. Additionally, an ever-urbanizing population suggests at maintaining relevance will require growing our impact in those environments.

Concerns over environment, climate, and the impact of both our activities and the products that we utilize and consume daily push us to consider how we can better address the grand challenges humankind is facing through our research, the way we train our students to lead the next generation in addressing those challenges, and our outreach to landowners and others. The work we do and the courses we teach across the board, from traditional forest management and operations to forest and ecosystems ecology, genetics and genomics, soils and water, human relationships with forests and environment, local to global scale modeling, and so many associated areas, have never been more important and relevant. Products from managed forests seem to be recognized more than ever as a key to a sustainable future, with the emergence of markets for carbon being perhaps the most surprising development I've seen in my career, personally. And recognizing that our students will work in a rapidly globalizing world, we now have to be able to rattle off expressions like "phytosanitary certification" as though we've always said them.

Finally, nearly every question we address requires data and data analysis skills. Data acquisition still includes boots-on-the-ground measurements but also involves use of satellite and drone sensors, automated instruments and sensor arrays at field sites, carbon flux towers, and the like. Data analyses are now conducted using GIS, statistical software, and programming platforms and languages whose names may sound like random alphabet references or slithering reptiles.

Though perhaps we could be tempted to keep looking back over the recent months, there is so much better to look forward to. We are thankful for your continued support and hope you will always be with us on this journey. Go Hokies!

Class of 2021: Connecting with Indigenous groups defines one Hokie's leadership journey

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made me want to continue to pursue the work I want to do in the future." That work involves finding spaces where western approaches to natural resource management can better merge with traditional ecological practices so that crucial knowledge can be shared collaboratively.

Nizhoni Tallas. Photo credit: Chelsea Tallas Photography.

"I feel like a lot of western science views traditional ecological knowledge as not actual science," said Tallas, the first Hokie to receive a Udall Undergraduate Scholarship in the tribal policy category. "But there is so much knowledge that has been passed on through tribal communities, and they have learned a great deal about how to steward the land in such a manner that it can prosper for generations. I'm trying to figure out how to intertwine those two ways of knowing so that everyone benefits, especially Mother Earth."

Tallas, a Presidential Global Scholar and Benjamin A. Gilman International Scholarship recipient who studied in Switzerland during her sophomore year, took an active leadership role on campus. As a member and current president of the group Native at VT, she worked to increase visibility and awareness of issues Native American communities face and took part in urging Virginia Tech to become the first university in the commonwealth to officially recognize Indigenous Peoples' Day.

Tallas' outreach extended to helping students who might be reluctant to take courses in natural sciences because of equipment costs. As a recipient of a Howard Hughes Medical Institute fellowship supporting inclusion initiatives, she tackled the challenge of improving success for nontraditional students entering science majors by advocating for field equipment kits to assist those who would otherwise have difficulty purchasing such equipment.

"Financial ability is one of the leading things that determines whether or not a student will succeed," Tallas explained. "When I was asked to think about barriers for students participating in STEM fields, I thought back to my experiences looking into the materials needed to take land and field measurement courses and wondering how I could afford them. So I thought it would be great to offer, discreetly, kits that had all of the required equipment that would help all students have a chance to participate in fieldwork."

Professor **John Seiler** of FREC, who worked with Tallas on the effort, said, "The field equipment kits she suggested were used in our spring labs, and her career ambitions and work ethic are perfectly aligned with the spirit of the David Wm. Smith Leadership Award. She is someone who is always thinking about how to help others and how to give back."

Tallas' ambition is to continue studying natural resources science in graduate school, with the aim of returning to her community to help tackle the environmental challenges that Indigenous communities face.
"It's been exciting to have spent four years in Virginia, but the community where I hope to have the biggest impact is back in Arizona. I feel like I'm ready to focus in and fine-tune how I can make a difference at home."

HIGHLIGHTS: TEACHING, RESEARCH, EXTENSION

FREC team assesses impacts to Glen Canyon National Recreation Area

Field data for approximately 40 indicators were collected using phone apps, which also recorded GPS locations and photographs of each campsite.

One of the most popular attractions in Coyote Gulch is the Jacob Hamblin Arch; this area contains both the largest number of campsites and those of greatest size.

FREC Ph.D. candidate Fletcher Meadema takes a break from fieldwork to enjoy yet another spectacular vista.

Public visitation on the Escalante District of the Glen Canyon National Recreation Area in southern Utah has increased substantially over the past decade. Day hiking and backpacking into the area's numerous canyons have led to concerns about the impacts of visitor use to the natural resources and visitor experiences in the district. These impacts potentially include the proliferation of campsites, degraded vegetation and soils, and problems with litter and improperly disposed human waste.

FREC Adjunct Professor **Jeremy Wimpey** partnered with the National Park Service (NPS) to assess visitor use levels, conduct a survey of visitors, and assess camping and trail infrastructure within the Escalante District. In late April a FREC-affiliated group, including Nathan Reigner (former M.S. student), Adjunct Professor **Jeff Marion**, and current Ph.D. students **Johanna Arredondo** and **Fletcher Meadema**, conducted fieldwork to provide NPS managers with quantitative data on visitor use, visitor perceptions of their experience and impacts, and campsite and trail inventory and assessment data.

The team located and assessed 191 campsites in five canyon areas, documenting substantial campsite proliferation and impacts in the most popular canyon, Coyote Gulch. Data collection will continue through spring 2022, and the research team is analyzing and summarizing data on canyon conditions and visitor survey responses with collaborative input from NPS managers.

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Field staff had to navigate cross country in slickrock terrain like this to access the various canyons.

FREC team assesses impacts to Glen Canyon National Recreation Area

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Jeremy Wimpey and Nathan Reigner assess a large alcove campsite in Coyote Gulch.

FREC Ph.D. candidate Johanna Arredondo, with coffee mug in hand, assesses her first campsite of the day in the upper portion of Coyote Gulch.

This large camping area is adjacent to the popular Jacob Hamblin Arch in Coyote Gulch; these were the largest campsites encountered during the study.

A very happy Jeff Marion in canyoneering garb thinking how lucky he is to be a collaborator on this project.

Zooming loggers, high-fiving naturalists, and forest landowner workshops: Extension agents reach out in new ways

In a typical year, getting training on logging practices in Virginia would mean going out into the woods and talking face to face with natural resource professionals. For a volunteer Master Naturalist, service hours might include leading school groups on a hunt for wild mushrooms. And forest landowners would look forward to getting together with peers and professionals to share ideas and swap success stories.

But in this year of Zoom meetings and social distancing, getting people together to learn about natural resources is a steeper challenge. In response, Virginia Cooperative Extension personnel affiliated with FREC have implemented new ways to provide outreach to the individuals and communities they serve. Surprisingly, they are finding that new approaches can yield positive benefits.

The SHARP Logger Program modified its three-module core training in response to the pandemic. The first session, in March 2020, was in person, the second online, and the third (pictured) was held in person in September 2020 according to recommended protocols. Photo by Karen Snape, Virginia Tech.

Loggers get SHARP on virtual learning

Virginia's Sustainable Harvesting and Resources Professional (SHARP) Logger Program has provided training for loggers and other professionals since 1996 and has been coordinated through FREC since 2002.

"Our programs meet the Sustainable Forestry Initiative's logger training requirements, and most of the large forest industry companies in Virginia require loggers to attend this training," explained Associate Professor **Scott Barrett**, who supervises the program. "The forest industry has a vested interest in the sustainability of forest resources."

Participants complete an initial core training program with sessions on sustainable forestry, logging safety, harvest planning and best management practices, and then maintain their status by earning 12 continuing education credits every three years.

"We've had some online training available for several years, but with the increased risks of in-person gathering, we've had to significantly increase our online and virtual offerings," said Extension Associate **Karen Snape**, who provides support for the program. "We've adjusted to offer our courses online and asynchronously, and we've expanded our offerings when it comes to continuing education courses."

In addition to offering many programs online during the pandemic, Virginia Master Naturalists have continued to work on stewardship projects while following health and safety protocols. Photo by Todd Minners, Arlington Regional Chapter of Virginia Master Naturalists.

Asynchronous courses do not have set meeting times; each individual can learn at their own pace. One benefit is that loggers who would ordinarily have to take days off work can more easily accommodate classes into their demanding work schedules. "Most loggers are working on a production basis, meaning that they are paid based on what they produce," Barrett said. "When they have to take a day off for training, that can impact them significantly."

While some trainings cannot be replicated online, Snape notes that participants have adjusted surprisingly well to virtual training.

"I've definitely seen an increase in their comfort level during the pandemic. Maybe it's having kids doing school online or connecting with loved ones via Zoom, but their capacity to make use of our online resources has improved."

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Zooming loggers, high-fiving naturalists, and forest landowner workshops: Extension agents reach out in new ways

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Virginia Master Naturalists pitch in

The Virginia Master Naturalist Program, a statewide organization of 29 chapters and more than 2,200 volunteers, works to provide education, outreach, and service to individuals and communities through citizen science and stewardship.

"There is still a big demand for people wanting to become Master Naturalists," said Program Director **Michelle Prysby**. "But when you're facing a global pandemic, that puts the brakes on a lot of what volunteers are able to do. A big message from me to volunteers is to do what you can, and we'll do what we can to find alternative ways to keep people engaged."

Many of the regional chapters have moved their meetings online, and the program has increased opportunities for online learning, providing more than 20 webinars to connect volunteers to new service projects and learning opportunities.

Debbie McDonald, a 1977 Virginia Tech biology alumna and a Master Naturalist in the Fairfax County chapter, has been helping the organization adjust to the challenges of the recent year.

"We were in the midst of our spring basic training course when the COVID outbreak struck," said McDonald, who is a member of Virginia Tech's Ut Prosim Society. "Our training team and board and sponsors had to pull together to transition to a virtual classroom for the 12-week course, and we had to figure out a way to do smaller field trips that met state guidelines, which was a huge commitment for our trainers and presenters."

Another outreach effort is the High Five From Nature webinar series, which covers five concepts or facts about subjects ranging from stream water quality to invasive insects to Virginia songbirds.

"The videos have been really popular," Prysby said. "People are looking for something to do in their home, and one thing that really unites our volunteers is that they love to learn."

Of course, most people who choose to become Master Naturalists do so because they love the outdoors. With outdoor recreation being one of the safest activities during COVID, parks and other natural areas have seen a dramatic spike in visitors, and Master Naturalists have pitched in to help.

"There's a great demand on staff in our state and national parks. While our volunteers aren't a replacement for those key workers, they at least provide an element of consistency," Prysby noted. "A state park employee recently told me that she was very appreciative that Master Naturalists were coming in to maintain a butterfly garden that is an attraction for the park."

From woodland retreats to online meets

The Virginia Forest Landowner Education Program targets new and experienced forest landowners while also serving as a conduit between landowners and federal, state, and local agencies and partnerships committed to the positive stewardship of natural resources.

"Our goal is to educate forest landowners so that they can make good decisions about their forestland," explained Extension Associate **Jennifer Gagnon**, program coordinator. "We strive to get new and established landowners involved and informed about how to be good stewards of their land."

Gagnon stresses that while hands-on, in-person education is the strength of the program, finding alternative ways to reach landowners has pushed her to learn new skills.

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The Virginia Forest Landowner Education Program was able to offer its popular Fall Forestry and Wildlife Field Tours in person in 2020 by incorporating several COVID-19 mitigation protocols. Photo by Jennifer Gagnon, Virginia Tech.

Zooming loggers, high-fiving naturalists, and forest landowner workshops: Extension agents reach out in new ways

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"Our strength is in-person work, putting equipment in people's hands to show them what we're talking about," she said. "Peer-to-peer education is powerful, and it is difficult to replicate that online, so we had to take a step back and rethink how to keep landowners engaged."

One effort that has seen a positive change is Preparing for Generation NEXT, a workshop aimed at helping forest landowners plan a family legacy for their land.

"For 10 years we've struggled to get multiple generations of a family in a room together," Gagnon said. "This year we had to convert those workshops online. To our surprise, we have found that the format has made it easier for generations of families to participate together."

Another success was a video series called "Fifteen Minutes in the Forest," where experts from Virginia Tech and other institutions present forest topics ranging from invasive plant species to how to age deer jawbones to Virginia's Christmas tree industry.

"It's been a steep learning curve, figuring out how to use video editing software and how to film effectively in the woods," Gagnon admitted. "But we now have 45 videos and 350 subscribers on our YouTube channel, and we've heard that teachers are using our work in their classrooms. It's gotten people engaged, and we plan to continue this series going forward."

Return to (a new) normal

Extension personnel are looking forward to getting back to the in-person outreach work that lies at the core of their mission. But if there is a silver lining to a disrupted year, it is that staff and volunteers have been challenged to find new ways to engage with individuals and communities.

"This year has really pushed us out of our comfort zones," Gagnon said. "We've been challenged to learn new technologies and figure out new avenues to satisfy our goals. None of this was what any of us anticipated, but the changes we've made will have positive and long-lasting effects."

Students see many forest operations on industry tour

Twenty-six FREC forest resources management and forest operations and business undergraduates and two graduate students participated in a forest industry tour throughout Virginia and West Virginia during the week of May 17. The group, led by FREC Professor **Chad Bolding**, spent each day in the field visiting logging operations, touring mill facilities, examining field sites displaying a range of management strategies, and meeting with forestry professionals in numerous aspects of the profession.

The group traveled over 1,150 miles in four days to tour the Reynolds Homestead Forest Resources Research Center, two sawmills, a paper mill, a flooring plant, a chip mill, a stave mill, and a veneer processing yard. Students also visited both Piedmont and mountain sites, investigating intensive pine silviculture and numerous mechanized logging operations, including in-woods chipping.

Thanks to our many hosts, alumni, and company representatives for making the trip a success! Special thanks are due to Hopkins Lumber Company, WestRock Company, Big Timber Superior Hardwoods and Veneer, and FREC for providing lunches!

Students visited several industry sites in Virginia and West Virginia during the four-day tour.

Standing next to Virginia Tech's Alwood Oak, Geoff Manning of Manning Arboriculture talks with students in Associate Professor Eric Wiseman's Arboriculture Field Skills class about the field of arboriculture and techniques to preserve old trees. Photo by Krista Timney, Virginia Tech.

Campus trees help train the next generation of arboriculturists

The Alwood Oak, one of the most distinctive trees on the Virginia Tech campus, is taking on a new role this year: teaching assistant.

Raised from a seedling by renowned entomologist and Virginia Tech Professor William Bradford Alwood and planted at the northern end of the Drillfield near the end of the 19th century, the 100-foot-tall bur oak is one of several campus trees currently being cared for by FREC alumnus **Jamie King**, who joined Virginia Tech in 2019 as the university's first-ever arborist.

This spring, King collaborated with FREC Associate Professor **Eric Wiseman** to allow students in Wiseman's Arboriculture Field Skills class to see firsthand how to care for old trees like the Alwood Oak and participate in protection strategies used by urban foresters and arborists.

"The biggest challenge in urban forestry is dealing with a tree's proximity to human activities," King said. "Development, foot and vehicle traffic, and soil compaction can all have significant impacts on tree health. And the natural aging processes for a tree, where they begin to shed limbs as they get older, requires careful attention."

Wiseman's students had a chance to talk to professional arborists contracted to check the tree's lightning protection system, which uses copper wires to transmit electricity directly into the ground instead of through the tree.

The students also learned about support systems utilized to prevent structural damage to big trees, and they got their hands dirty — or at least sappy — installing a brace rod in a nearby tree.

"The chance to be hands-on with activities has been an extreme confidence booster," said **Cydney Chambers**, a junior majoring in forest resources management. "I feel much more confident applying for jobs knowing I've actually practiced some of the skills we'll be expected to use in the future."

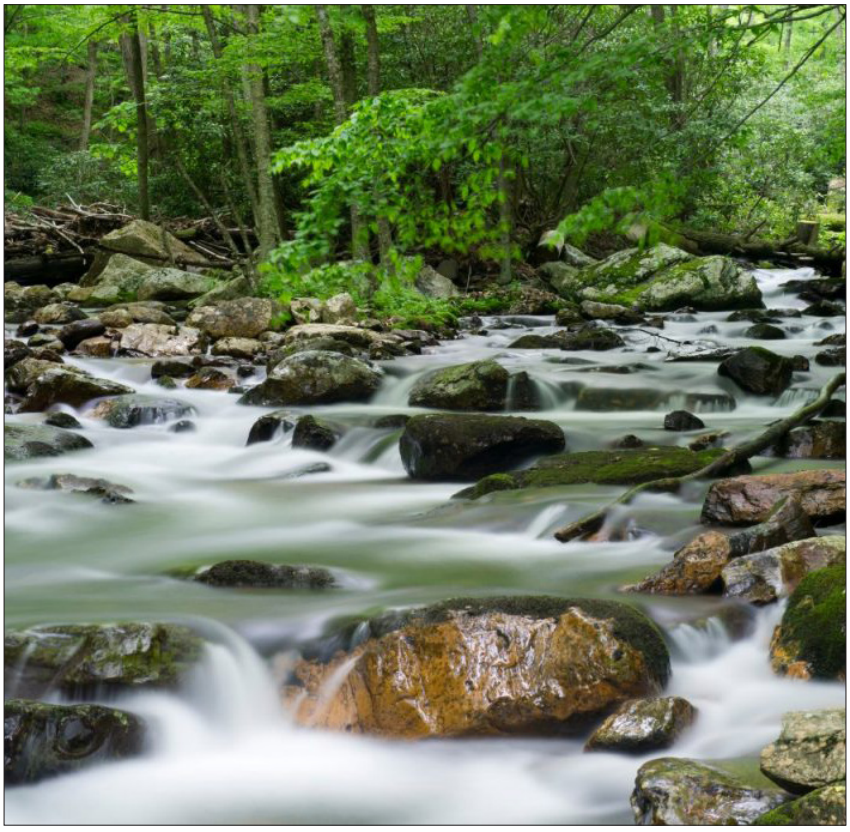
"This course is all about the practice of arboriculture," Wiseman said. "In the fall, our lab focuses on the science behind trees living in built environments, and we spend a lot of time observing, measuring, and evaluating trees. In the spring, we get into the practice side of the science."

King, who studied under Wiseman as an undergraduate before pursuing a career in arboriculture, recognizes the important role that trees have in enhancing life for all Hokies. "I feel a great deal of responsibility," said King, who aims to develop an urban forester internship program for students. "There are a lot of people in the field who know and care about the trees on campus. Trees are vital to everyone's experience at Virginia Tech."

Ben Stauffer, a junior majoring in forest resources management, recognizes the important role that trees play in enhancing the experiences for students. "Not only are we benefiting from the ecosystems services trees provide, but they contribute to the unique aesthetic that the campus has," he said. "Fall foliage is always commented on and shared across social media, and on warm days people all over campus are sitting beneath the trees or tying slack lines to them."

What can stream quality tell us about quality of life?

Researchers in three university departments are using stream quality data to find new insights into the interactions between the health of our natural spaces and human well-being. Their findings, published in the journal Ecological Indicators, reveal that demographics such as race and population density, as well as health indices such as cancer rates and food insecurity, show strong correlations with water quality across the commonwealth.



Virginia Tech researchers are using stream quality data to find new insights into the interactions between the health of our natural spaces and human well-being. Photo by Brad Klodowski, Virginia Tech.

The researchers used two key data sets: water quality measurements provided by the Virginia Department of Environmental Quality and county-level demographics data from the U.S. Census Bureau. They considered 13 indicators of human well-being, four demographic metrics, and two indicators of stream health.

"We had large data sets that we had to organize and process," explained Professor **Marc Stern** of FREC. "Our expectations on finding meaningful relationships between stream health and human factors weren't that high. The fact that they showed up so distinctly was a surprise."

"We started off wanting to explore the general, intuitive relationship between human well-being and ecosystem health," explained Paul Angermeier, professor in the Department of Fish and Wildlife Conservation and assistant unit leader of the Virginia Cooperative Fish and Wildlife Research Unit for the U.S. Geological Survey. "Many of us intuit that healthy ecosystems produce benefits that accrue to people, but that outcome isn't well documented in a quantitative way."

Associate Professor Leigh-Anne Krometis of the Department of Biological Systems Engineering said, "For instance, at the state level we have a Department of Environmental Quality and a Department of Health, which both deal with the subject of water quality, but in different ways. What we wanted to see was how those two perspectives converge."

The findings show that there is a strong correlation between ecosystem health and human demographics, particularly along the lines of race. Stream conditions were found to be better in counties with higher percentages of white residents. More polluted streams were correlated with higher degrees of overall mortality.

"The term 'environmental justice' is important to bring into our discussion," noted Stern, a senior fellow in the Center for Leadership in Global Sustainability. "These findings relate to the broader issue of systemic prejudices and the reality that our institutions and social systems do not favor marginalized communities. They get caught up in a cycle of being left behind, and while it's not impossible to break that pattern, it's going to take work."

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Capstone students design management plans for forest landowners

Forestry students Brandon Hughes, left, and Riley Ripa begin the process of recording inventory data on a tract of private forest land in Blacksburg. Using an app to randomly select plots, they then locate the plots, mark them with stakes, and measure and record data about the trees within each plot. Photo by Krista Timney, Virginia Tech.

In Southwest Virginia, one acre of forest might contain oaks and eastern redbuds. It might contain tall, creaking ash trees killed by invasive insects, or white pine blistering with a fungal invasion. It could be home to foxes or raccoons, to barn owls or pileated woodpeckers. The understory might have useful plants such as goldenseal or American ginseng rising out of the fertile soil, or invasives like autumn olive threatening to alter the ecosystem.

Now imagine expanding that one acre to 80 acres, trying to document all of it, and then formulating a strategy for managing it – a forest management plan. That is the task assigned to teams of seniors enrolled in the Integrated Forest Management Practicum, a capstone course for FREC forestry majors.

"The first step is meeting with the landowner and finding out what they want to do with their forest," explained Associate Professor **Scott Barrett**. "Then our students go onto the property and do an inventory of the forest resources that are available to work with. They divide the property into management units called stands, and then they present a management recommendation to the landowner."

For the students, who will graduate from the only four-year forestry program in Virginia accredited by the Society of American Foresters, this experience is the culmination of taking what they've learned in the classroom and the lab and applying it to a real-world field project.

"What this class is doing is taking all of our classes and bringing them together towards one project," said **Leah Wood**, a senior pursuing dual degrees in forestry and wildlife conservation. "It's a challenge, but we've already done inventory and plotting and other forestry work in labs, which has made the transition to taking on a big project easier."

With COVID-19 restrictions making group travel difficult, students have worked this spring on private land in Blacksburg and on land owned by the New River Resource Authority in Floyd County. Each team has different landowner objectives to consider, from creating an outdoor education and recreation area, to determining how to produce and maintain marketable timber, to enhancing wildlife habitat.

Their onsite work is supported by regular Zoom meetings with faculty and classmates, as well as refresher lectures on subjects such as silviculture, economics, forest measurements, and using fire as a management tool. Some students have used new technologies to learn about sites before getting their boots on the ground.

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What can stream quality tell us about quality of life?

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Virginia is a suitable microcosm for revealing such dimensions; the state has high-density cities, suburban and rural areas, coastal and mountain geographies, and socio-economic diversity that all make it a useful starting point for broader research into the subject of human-environment interactions.

"We still don't have hard data on how people are interacting with nature," said Angermeier, who, along with Krometis, is an affiliate of Virginia Tech's Global Change Center housed in the Fralin Life Sciences Institute. "For instance, we found that mortality rates for people are correlated with contamination levels in fish. What does that mean? Are people eating contaminated fish, are they merely sharing a polluted water source, or is it something else?"

The project was funded by Virginia Tech's Global Change Center, the Institute for Society, Culture, and the Environment, and the Fralin Life Sciences Institute. The contributing faculty members aim to expand their research by looking to see if similar correlations between environment health and human well-being extend across the Mid-Atlantic and the U.S. as a whole.

Capstone students design management plans for forest landowners

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"I learned a lot about using geospatial information in programs such as ArcGIS, and that let me do some analysis on the property before we got there," said senior **Riley Ripa**. "Before going to the property, I already knew how big it was, what percentage of the land was forested, and what the soil type is there. I was even able to identify sinkholes on the landscape."

The task of working directly with a landowner to put knowledge into action is a crucial experience for aspiring foresters.

"It's a new challenge, working with the landowners," explained Ripa, a member of the Virginia Tech Corps of Cadets and the Forestry Club. "In class with professors and classmates, we know all of the lingo around the techniques we use, but for a landowner who might've just purchased the land, you have to explain the processes and the reasoning behind what you're recommending to them."

For Wood, who started work as a professional development forester for a timber company in South Carolina after graduating, the capstone course has been valuable groundwork for embarking on a career in the industry. "From making sure we have tree species down, to being able to measure and assess merchantable timber, we've gotten a great education to move us into being able to put our learning into a real-life project," she said. "We've been taught everything we need to know, and I feel confident that I know my stuff."

Callery pear blossoms represent biodiversity loss in Virginia ecosystems

Callery pear trees with white blooms line Virginia's roadsides, displacing native trees. Photo by Mark Sutphin for Virginia Cooperative Extension.

Each spring, roadsides across the commonwealth are blanketed by white blossoms as wild Callery pear trees bloom. Popular cultivars of the species, such as the "Bradford" pear, have been widely used as ornamental landscape trees since the 1970s. Bradford pears were initially seen as cost-effective, fast-growing, and easy-to-establish additions to the suburban landscape, but their structural weakness as mature trees and the ease with which their seedlings spread present several problems.

"Bradford pears are beautiful as young trees, but as they mature, you will eventually experience losses when you install them in your landscape," said **Eric Wiseman**, FREC associate professor of urban forestry and arboriculture and a Virginia Cooperative Extension specialist. "They grow very fast and tend to have very upright branches growing close together. Often, these branches will grow into one another, trapping bark in between them, which creates an 'inclusion' that causes friction and can cause the tree to split."

Ornamental plantings of Bradford pear often produce fertile seeds that are readily spread by birds. These wild-growing seedlings can develop undesirable characteristics, notably sharp thorns. Since Callery pear trees are tolerant of harsh growing conditions and poor soil, they establish easily in disturbed areas, such as roadsides.

"There are some areas along roads that are now 100 percent Callery pear trees," Wiseman said. "They're also very hard to control. If you cut the stem back at ground level, it will still grow from the root, so all you've done is cut the plant back, not kill it," he added.

The Callery pear's spread throughout the commonwealth represents the shrinking biodiversity of Virginia's urban forests. "More resilient forests are less susceptible to problems with disease and insect pests," Wiseman said. "The Callery pear is not a good tree to have in the urban environment."

There are alternatives to invasive Bradford and Callery pear cultivars. Wiseman emphasizes that "nonnative" does not necessarily mean "invasive," and some nonnative tree species make fine replacements, though he does recommend planting native species when possible, such as the following:

- Flowering dogwood, *Cornus florida*
- Serviceberry, *Amelanchier spp.*
- Green hawthorn, *Crataegus viridis*
- Chokecherry, *Prunus virginiana*
- White fringe tree, *Chionanthus virginicus*

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Callery pear blossoms represent biodiversity loss in Virginia ecosystems

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A few nonnative alternatives are:

- Japanese tree lilac, *Syringa reticulata*
- Crepe-myrtle, *Lagerstroemia indica*
- Tatarian maple, *Acer tataricum*
- Amur maackia, *Maackia amurensis*
- Adirondack crabapple, *Malus 'Adirondack'*

For more information on woody plants in the landscape, check the Virginia Cooperative Extension publication "Selecting Plants for Virginia Landscapes: Showy Flowering Shrubs."

Summer interns study xylem morphology and production

Three summer undergraduate research interns are working in FREC Associate Professor **Carolyn Copenheaver**'s lab to explore the impact of growing season frost on xylem morphology and production in different tree species. The students are collecting increment cores and looking for evidence of "frost rings" — deformed bands of xylem cells caused by water expanding during a frost event. They are also measuring tree-ring widths to determine if annual stem growth is reduced during years when trees must produce a second flush of leaves because the first set was killed by growing season frosts. The students working on this project are Divinity Richardson and Olivia Dean, both environmental science majors at Virginia Wesleyan University, and **Natalie Hedrick**, forestry major in FREC.

Increment bore

Divinity Richardson

Olivia Dean

Natalie Hedrick

Virginia Tech earns 13th Tree Campus USA recognition

Students participated in a 2021 Arbor Day planting event in the Old-Growth Forest, commonly known as Stadium Woods. Meghan Marsh for Virginia Tech.

Virginia Tech's holistic approach to university forestry — rooted in planning, collaboration, education, and community engagement — has helped the university earn Tree Campus Higher Education USA recognition for the 13th consecutive year. Virginia Tech achieved this distinction by meeting five national standards, which include maintaining a tree advisory committee, operating a campus tree-care plan, dedicating annual expenditures toward trees, organizing an Arbor Day observance, and delivering ongoing student learning and engagement opportunities. The Arbor Day Foundation launched Tree Campus USA in 2008.

Heading up Virginia Tech's efforts is FREC alumnus **Jamie King**, who joined the Division of Campus Planning, Infrastructure, and Facilities as university arborist in 2019 after having served as Roanoke's city arborist for seven years.

Trees are among the most visible representations of Virginia Tech's commitment to environmental stewardship. Pathways to advance tree preservation, reforestation, and education are prescribed throughout a number of key university frameworks, including the Campus Master Plan, 2020 Virginia Tech Climate Action Commitment, and the Virginia Tech Blacksburg Campus Urban Forest Master Plan, which is currently going through the public comment phase.

Since 2008, more than a thousand trees have been planted on the Blacksburg campus through a joint effort by King, the University Arboretum Committee, Facilities Operations, Office of University Planning, Capital Construction and Renovations, and CNRE.

The Campus Tree Inventory and Interactive Tree Map is another collaborative resource helping guide tree preservation and maintenance. The inventory includes location, species, measurements, and health and condition details for more than 9,849 living trees and historical records.

King partners closely with the Office of Sustainability and FREC to offer students immersive learning experiences in urban forestry. These include hands-on sessions at campus trees, tree plantings throughout the year, and urban forestry student internship opportunities.

2021 Arbor Day planting at Virginia Tech.

SPOTLIGHT: FACULTY, STAFF, AND STUDENTS

Promotions to professor

Brian Strahm

Jason Holliday

Congratulations to this year's outstanding mentors

Professor **Marc Stern** received the Outstanding Graduate Mentor Award. The Graduate School recognizes Virginia Tech faculty from across the university's colleges for their outstanding work mentoring graduate students. These award winners are nominated by graduate students and chosen by their colleges.

Carol Franco, senior research associate, received the Outstanding Undergraduate Mentor Award. The Office of Undergraduate Research acknowledges the hard work, time, dedication, and guidance research mentors provide to undergraduate students, which often goes unrecognized. Current undergraduate students are asked to nominate one Virginia Tech faculty or graduate student research mentor from any discipline for the award of Outstanding Undergraduate Research Faculty Mentor.

2021 FREC student awards

Kelley Anderson, 2021 A.B. Massey Outstanding Doctoral Student

Alison Ritz, 2021 Outstanding Graduate Teaching Assistant Award

Pedro J. Sartori, H.E. Burkhart Outstanding Master's Student

Nizhoni Tallas, 2021 David Wm. Smith Leadership Award (and college-level winner)

Erika Wright, FREC 2021 Outstanding Senior

Burkhart receives Distinguished Alumnus Award

Harold Burkhart

University Distinguished Professor **Harold Burkhart** of FREC was recognized by the Department of Natural Resource Ecology and Management (NREM) at Oklahoma State University with its inaugural Distinguished Alumnus Award in a virtual awards ceremony in March 2021.

Burkhart graduated from Oklahoma State with a B.S. in forestry. NREM was formed in 2006 by merging faculty from the university's Departments of Forestry, Rangeland Ecology and Management, and Wildlife and Fisheries Ecology and Management.

AWRA Student Chapter wins national award

Congratulations to the Virginia Tech American Water Resources Association (AWRA) Student Chapter! The group was selected as the 2021 winner of the N. Earl Spangenberg Outstanding Student Chapter Award.

The AWRA Student Chapter received the award for activities that further AWRA's objectives and include clean-up events, a stream bank restoration project, Adventures on the Gorge program development, Virginia Tech Science Festival, Earth Week events, a successful recruitment strategy, chapter meetings, guest speakers, and social events. The Virginia Tech chapter's faculty advisor is FREC Professor **Kevin McGuire**.

To find out more about the chapter and how to get involved, visit gobblerconnect.vt.edu/organization/AWRAVT. The N. Earl Spangenberg Outstanding Student Chapter Award is given each year to recognize an AWRAVT student chapter that has provided outstanding service in the furtherance of the association's objectives. The award is named in honor of the late AWRA past president, who formed the first student chapter of AWRA.

Wiseman honored with CNRE Award for Outreach Excellence

Eric Wiseman, FREC associate professor, has received the College of Natural Resources and Environment's Award for Outreach Excellence.

Eric Wiseman

As an active member of the Mid-Atlantic Chapter of the International Society of Arboriculture (MAC-ISA), Wiseman routinely coordinates their annual meeting at Virginia Tech, bringing over 400 foresters to campus.

Through collaboration with the Virginia Department of Forestry, he performed urban forest assessments for five municipalities to guide their urban forest planning. He is credited with the creation of the Urban Forest Management Plan of Virginia Beach.

Wiseman is the coordinator of the Virginia Big Tree Program. Established in 1970, the program documents the largest trees found in the state. The program thrives on amateur naturalists and citizen scientists who contribute over 90 percent of the nominations to the Virginia Big Tree Register.

Pownall showcases Diversity Scholar project

Malia Pownall

Malia Pownall, a master's student in FREC, was one of 10 Diversity Scholars of Virginia Tech's Graduate School who shared their projects with the university community and the public in a virtual spotlight showcase on Friday, May 7. The event featured a short video from each of the 10 scholars discussing their work.

Pownall offered the following description of her project: "This project involves participatory, community-engaged art. The outcome of this project will be a visual collection of thoughts, feelings, ideas, reflections, and dreams from community members who participate. I hope that this project will encourage participants and observers to reflect on how they feel included in Blacksburg or at Virginia Tech, and to recognize how others may experience these collective spaces differently."

The Graduate School developed the Diversity Scholars program in 2012 to help students develop and implement projects to improve inclusion and diversity through dialogue, advocacy, and change across the university's campuses. Past projects have included organizing and holding the university's first powwow, creating support groups and mentoring programs for underrepresented students, producing films and multimedia displays, hosting discussion groups, and more.

Assistant Director for Recruitment, Diversity and Inclusion Justin Grimes said, "These exceptional VT graduate students raise critical questions which challenge everyone to create spaces where individuals feel welcomed, acknowledged, safe, and successful."

Class of 2021 tree planted

CNRE's tradition of planting a tree in honor of the graduating class continues! This sassafras was planted outside Latham Hall on the Virginia Tech campus to commemorate the CNRE class of 2021. Thank you **John Seiler**, **Eric Wiseman**, and graduate student **Ethan Apisa**! See details about the tree at buff.ly/3tQ8MCF.

ALUMNI NEWS

Laura Hendrick is a forestry and fire boss in North Carolina

Laura Hendrick

Handcrew prepping for burnout on Tokkewanna Fire in Wyoming, 2016.

Prescribed burning marsh grass for black rail habitat in Carteret County, North Carolina, 2021.

FREC alumna **Laura Hendrick** has been in forestry and wildfire since 2008 when she finished her master's degree in forest management. At the beginning of her career, she was focused on writing management plans and practicing silviculture in the coastal plain of North Carolina. However, because of the unique timber and soil types she was working in, she was immediately thrown into wildfire.

Starting out with no experience and building up to Heavy Equipment Boss/Prescribed Burn Boss 2 Trainee, she now assists the Station Forester on Marine Corps Air Station Cherry Point, where she is in charge of the wildland fire program. Laura loves the flexibility of her job because she can be timber cruising one day and then go right into a wildfire or a prescribed burn.

Laura's first fire assignment was in the operations room, where she initially felt useless until she later realized that she was an essential part of the equation, dispatching needed equipment for the people out on the fire. After that, she took S-130/190 as soon as she could so she could be on a handcrew. By 2011, she was really hooked on prescribed burning and wildfire, and felt lucky to be on engine strike teams, walking behind dozers and burning out, and was also on an incident management team.

Laura's advice to younger females in the field includes, "The first thing is to not be afraid to go after what you want. Set your eye on the prize and don't give up. Hold true to what's in your heart… I never gave up on the positions I wanted, and eventually I got there. In wildland fire the hard part is that it just takes time… Accepting that not every day is going to be a good day makes things easier to process. Be hardheaded but flexible and you can make it happen."

Adapted from an article on the website Women Owning Woodlands (bit.ly/3hjuvzS).

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Please send information for future issues to tracey@vt.edu

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