



Next Generation Scholars Program aims to increase diversity in forestry and environmental resources fields

A Next Generation Scholarship enabled Cydney Chambers, pictured during a fall 2020 field lab, to conduct research this summer under the guidance of Associate Professor Carolyn Copenheaver, using centuries-old land survey documents to gain insight into what North American forests looked like as European colonization progressed.

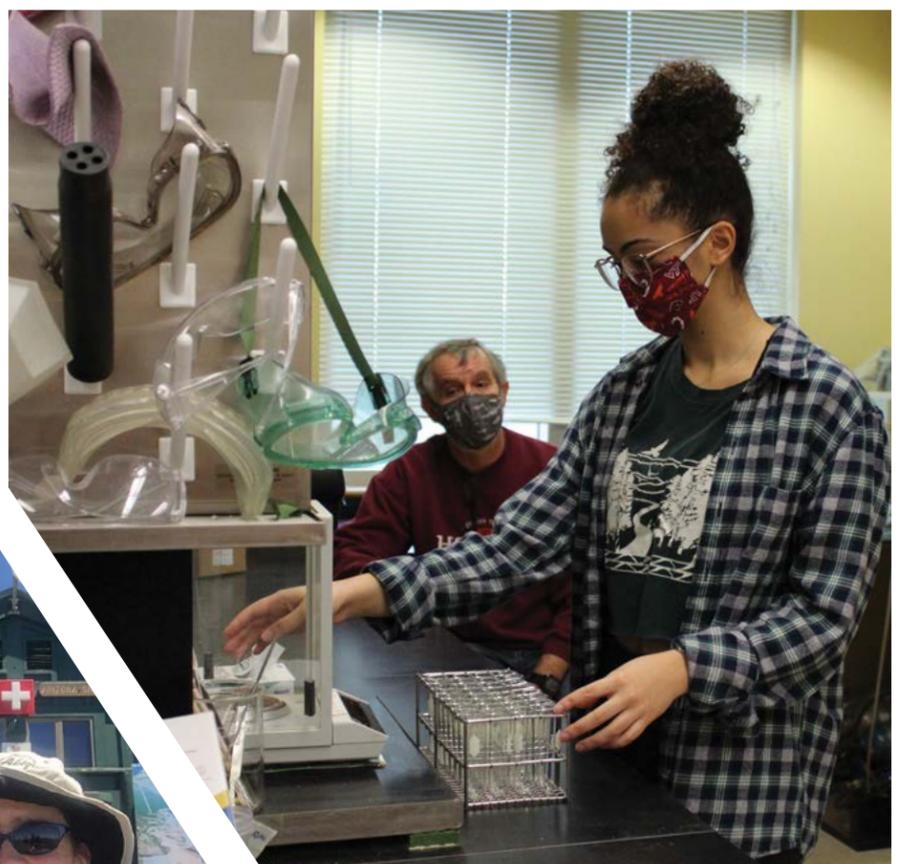
For Emily Barrett Cook, growing up in the foothills of the Blue Ridge Mountains wasn't enough to put a career in forestry on her radar. "I came to Virginia Tech as a biochemistry major," said the 2020 forestry graduate who is now pursuing a master's. "As a first-generation student, I was really lost in the whole process and quickly realized it wasn't a fit for me. I heard about the forest resource management concentration and jumped in, and I've loved it ever since."

Cook's experience reflects a challenge faced by forestry-related industries: having traditionally relied on informal pathways and networks to draw workers, both industries are struggling to diversify their workforce.

Now, the college's Next Generation Scholars Program is providing significant financial support to underrepresented students majoring in forestry and environmental resources management. "The goal of the program is to increase diversity at the undergraduate level, in part so that we can potentially have more diversity in the pool of graduate students pursuing careers in forestry or natural resources," explained Associate Professor Carolyn Copenheaver, who spearheaded the program with Professor John Seiler and Assistant Professor Adam Coates of the Department of Forest Resources and Environmental Conservation. "In considering what students we were interested in, first-generation students were an important target, as were women and people who come from an underrepresented racial minority."

The program, funded through the USDA's Higher Education Multicultural Scholars Program, provides students with a \$6,500 scholarship in their senior, junior, and sometimes sophomore years, with additional funds available for professional development or summer research work.

"This scholarship has impacted my life significantly, as money was something I was worried about," said Heaven Aziz, a senior studying environmental resources management. "But beyond that, it made me realize that there are people at the college looking out for me who are willing to go out on a limb for me. I'm so much more comfortable with my professors in the college, and that's translated to my interactions with other professors."



ABOVE: Heaven Aziz conducted a research project this summer on the wax content of leaves of the mountain laurel, a shrub species that is highly flammable, with Professor John Seiler (seated) and Assistant Professor Adam Coates.

LEFT: Emily Barrett Cook (left) and Carolyn Copenheaver attended the North American Forest Ecology Workshop in Flagstaff, Arizona, in June 2019.

Reaching students mid-stride

Recognizing that first-generation and minority students often struggle to get their degrees, Copenheaver wanted the scholarship program to reach students who had already started their college experience. "There are numerous scholarships that focus on getting freshman students into a major, but we know that many of the students in our college find us later. We wanted to help students who were through their first and perhaps second year, students who were doing well but needed some help maintaining their success."

Thanks to her scholarship, forestry major Cydney Chambers conducted a research project this past summer. Applying her learning while working collaboratively with professors has given Chambers confidence to find her voice: "When you realize that your major is comprised of people who aren't like you, it can feel intimidating to try to convey your knowledge and demonstrate expertise. With this scholarship, I've gained a confidence that I'll need to succeed in this field."

The importance of mentorship and giving back

Copenheaver said that one of the aspects she's most enjoyed about the program is the strong bonds she forms with the students. "It's great to work with them and see them make strides in their knowledge and confidence."

Being a Next Generation Scholar has provided Aziz with connections she didn't expect at a large university like Virginia Tech. "When people ask me about my college experience, they often talk about how big Tech is and ask if I ever feel lost. I tell them not really, because I feel like the CNRE is a family, and this program is a huge part of that."

To help reach future students, scholarship recipients take a service-learning course taught by Seiler to learn how to effectively communicate science to a broad audience. They then develop presentations about their major and share them with area middle and high schools.

Copenheaver notes that it is especially important that programs in forestry and environmental resources encourage the participation of underrepresented students. "I think the CNRE is a welcoming place, and if students can find us, they are happy here. But there is a challenge of role models, of finding people who will keep an eye out for you and be aware of what experiences and backgrounds a student might be bringing in and how those might differ from one person to another."

Cook, the first recipient of a Next Generation Scholarship, can already see a change coming. "When I finished my undergraduate degree, there were three women graduating in my major. I never felt any prejudices from my classmates, but it was something I was aware of. But I saw that there were a lot more women in the class following mine, and even more in the one following that. It seems like the field is really changing, and I feel fortunate to be part of that change." **Full story:** cnre.vt.edu/fall2020mag

From the Dean's Perspective



The pandemic has changed everything for everyone and has made us shift much of our activity in the college to alternate ways of teaching, research, and outreach. We have learned a lot about how to deliver quality programs and classes, and how to continue our research and outreach while maintaining a safe environment. We miss in-person instruction and that face-to-face, hands-on environment that is the hallmark of the college, but we have learned new ways to accomplish our goals.

Thank you to our faculty, staff, and students for moving forward together, maintaining a can-do attitude, and supporting each other. We know that what we are all experiencing and doing to navigate these times is not normal for any of us. Thank you to our many alumni and partners for your continued engagement as you face challenges of your own in your organizations, businesses, and families.

It is a sensitive balance of respectful awareness for me that our first priority remains human safety, as the focus of our faculty and staff is to stay on track and deliver on the obligations and responsibilities that are in front of us each day while keeping an eye toward the future. Even in the most challenging of times, we must think about positioning the college for a successful future; it is the driving force for us all.

We are exploring new curricular initiatives, planning for additional college infrastructure, envisioning expanding our presence in Washington, D.C., exploring ways to grow and diversify our student enrollment, and building stronger relationships with our alumni, partners, and friends. The world needs us. Our work is important, our impact is measurable, and we are creating the future.

This issue of the newsmagazine is full of a variety of rich stories and updates on the exceptional activities in the college. I am impressed with our faculty and often wish I could go back and be in their classrooms and labs, and under their mentorship. Our center pages highlight some of the interesting work in our geography program. We've included a faculty perspective that describes one way student learning is accomplished during a pandemic; there are countless more examples of how our faculty have stepped up to deliver quality instruction. Creativity and commitment reigns amidst our faculty!

We wish you a safe journey ahead. Please stay engaged with us. We look forward to seeing you in person one day soon.

Warm regards on behalf of our faculty, staff, and students,


Paul M. Winistorfer
Dean

VIRGINIA TECH.
BOUNDLESS
IMPACT



FACE COVERINGS IN PHOTOS

You will notice throughout this issue that individuals in photos are shown wearing face coverings whenever possible. Masks represent our commitment to each other and our community. They are part of our current normal. Our task as communicators is documenting this new normal; our charge as Hokies is setting a good example.

Experiential learning during a pandemic

by Professor Audrey Zink-Sharp, Department of Sustainable Biomaterials



Professor Audrey Zink-Sharp demonstrates one of the handheld microscopes she provided to her students.

Classes in our college are known for their experiential learning opportunities; our approach is a long-standing hallmark for us. We value experiential learning and teaching, we put the principles in practice every day, and our students' academics are better for it. But how do we maintain this excellence during a pandemic?

I have learned from both faculty and students that teaching and learning right now is such a varied experience — everyone is going through something different, difficult, and unusual, all at the same time. However, most CNRE faculty are focusing on the positives, describing their classes as efforts to be proud of and “an adventure,” appreciating that they can teach an online class from anywhere, and thinking about how they can improve their teaching for the future.

While faculty comments encompass a wide range in viewpoints, it seems clear that teaching hybrid classes (where part of the class is in person and part is online) provides opportunities and challenges that are new, uncharted territory for most of us. Persistence, optimism, grit, and creativity are all being brought into play in providing meaningful and genuine experiential learning experiences for our students.

Like many of my colleagues, I teach both lecture and laboratory classes. I was planning to deliver my lectures

online and my lab sessions in person this fall. Then things changed and I needed to deliver my lab classes online as well as in person. I scrambled to find a creative way to teach plant anatomy remotely.

My solution was to provide small, battery-operated microscopes to my students, accompanied by lab kits I put together. These little microscopes are very capable and have been an exciting addition to my class. The students can take pictures with their cellphone through the microscope and have examples available to study anytime, anywhere.

As a result, my students are making a stronger connection to the class material now that they participate in preparing the study materials. They seem to have fun using this “modern” approach more than the higher quality, traditional microscopes used in the lab. Several faculty members are also preparing lab kits and field kits that students can use on their own schedule or during class, while others are teaching complicated subjects such as dissection of class specimens using online synchronous instruction.

Regardless of delivery method, in CNRE we are capturing new opportunities to achieve our learning outcomes and are excited about creating meaningful experiences for our students even during this unusual time. Providing experiential learning is what we do and do well.

Full story: cnre.vt.edu/fall2020mag

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Virginia Tech is an equal opportunity and affirmative action employer. Women, minorities, individuals with disabilities, and protected veterans are strongly encouraged to apply. Anyone having questions concerning discrimination or accessibility should contact the Office for Equity and Accessibility.

The Marching Virginians have an advantage that few other bands can match: their very own weather forecaster. Senior meteorology major **Ben Sheppard** has been designated as the band's first "Official Forecaster."

"In my freshman year, my bandmates would joke that it was my fault when the weather was bad," Sheppard, a trumpeter, recalled. "So I started using what I was learning in class to write up humorous weather reports for the trumpet section. By my junior year, the band directors were asking me if I could send my reports to them to help their planning."

Sheppard, who also provides forecasts for away games and exhibitions, enjoys the challenge of focusing on a specific location and time frame. "I utilize information from various forecasting sites, obtaining charts that my training has taught me how to analyze. I can zoom in and really nail down the forecast parameters accurately."

And with extra steps in place this fall to help prevent the spread of COVID-19, including outdoor practices, having accurate weather forecasts has taken on a greater significance. "Ben is an extraordinary student and a huge asset to the band, so we created a position especially for him," said Chad Reep, assistant director of athletic bands.

In addition to his coursework, Sheppard has done atmospheric research for the Johns Hopkins University Applied Physics Lab, where he has landed paid internships for each of the past two summers, and volunteered for the National Weather Service, utilizing crowd-sourced storm reports to improve severe weather warning systems.

Full story: cnre.vt.edu/fall2020mag

Marching to a different forecast



Ben Sheppard (center) is The Marching Virginians' first "Official Forecaster."

Students in Associate Professor **Phil Radtke's Introduction to Land and Field Measurements** course (right) learn how to navigate via compass during an outdoor lab session near the Duck Pond.

Collegiate Assistant Professor **Kevin Hamed** moved his Mammology lab (far right) outdoors to ensure that his students had the hands-on experience of learning mammal identification skills in person. "We are trying to show the students that this is a great opportunity to learn how to be adaptive and creative," he said.



Water monitoring station provides research experiences for students

Beside a headwater creek on property that will be added to the Blacksburg park system, a new hydrological monitoring station is transmitting data on the amount of water coming through the creek as well as its temperature, turbidity (the relative clarity of the water), and conductivity (how well the water conducts electricity).

"We benefit from having a nearby site where we can conduct research and help train students," said Collegiate Assistant Professor J.P. Gannon, who teaches in the emerging field of environmental informatics. "For the town, they're keenly interested in how trail development is going to affect water quality in a watershed that drains into Tom's Creek."

In the spring semester, three students participated in most aspects of the station's construction, from calibrating the instrumentation, to testing the station's capacity to transmit data, to choosing a field site. Due to the outbreak of COVID-19, however, Gannon had to complete the final step of placing the field sensors that communicate data to the water station.

A primary goal of the project is to provide students with field research experiences that cannot be replicated in the classroom. "Having a field site close to campus will allow me to use it for course-based undergraduate research, which will involve getting 30 to 40 students all participating on a research question," said Gannon. **Full story:** cnre.vt.edu/fall2020mag

In February 2020, J.P. Gannon (center) worked with students (left to right) Marley Gilliam, Kelly Crum, and Scott Braatz to troubleshoot the connection between the sensors and the data logger for the water monitoring station.



FIND IN-DEPTH ARTICLES ONLINE Many of the articles that appear in CNRE News are based on longer press releases. Any article in this issue that is followed by the URL cnre.vt.edu/fall2020mag is available in its full-length format on our website.

Meet some of the rock stars of V

THEY ARE AT CENTER STAGE IN THE SCIENCE OF UNDERSTA

They seek to explain how the people and places on our planet are intricately connected. Their work impacts how we stay healthy, interact with water, and remain resilient in the face of natural disasters. They seek knowledge of how climate change is affecting the natural world and share the know-how that is driving tools like geospatial technology.

These stories represent just a fraction of the great work that is happening in the Department of Geography and in collaborations across the university when we put the planet – and our relationship with its places – front and center.



ANAMARIA BUKVIC

WARMER MOUNTAINTOPS, WETTER COASTS

At the edge of a retreating glacier, bedrock terrain is revealed for the first time in several hundred years. Trees on warming mountain peaks are gradually moving higher. Along Virginia's coast, sea levels are rising.

These landscapes are the frontiers where two geography faculty members are investigating how climate change will impact both the natural world and the communities where we live.

Understanding emerging mountain ecosystems

Professor Lynn Resler researches high elevation ecosystems, studying the dynamics that contribute to alpine tree line vegetation change. "A lot of my work is predictive: I'm looking at what is happening right now and using that to understand what will happen in the future. Understanding pattern-process relationships is key to figuring out how these ecosystems are going to be impacted by climate change."

Resler, an ecological biogeographer, has recently been researching ecosystems that develop as land becomes exposed in the wake of glacier melt in Glacier National Park. She explained that on both mountaintop tree lines and glacier edges, climate models alone cannot predict what developing ecosystems will look like because many factors contribute to species range dynamics.

"I think there's an expectation that as glaciers retreat, the ecosystems that develop on newly exposed terrain will be the same as those that currently exist in the surrounding environments. But under changing climate scenarios, there are opportunities for new kinds of plants to colonize. The lags in colonization of surrounding plants are leaving space for invasive species to take hold and may alter the landscape significantly."

Climate challenges to coastal living

Assistant Professor Anamaria Bukvic seeks to understand how people experience and cope with coastal flooding to better inform adaptation and resilience policies and programs. "We are currently exploring the role of sense-of-place in a household's decision to stay or move from a coastal community in response to flooding."

Bukvic, a human geographer, also studies the impacts of recurrent or nuisance flooding on relocation decisions. "While a majority of our respondents state it will take a big disaster like Katrina or Sandy to drive them away, smaller but frequent flood events can also serve as stressors that will gradually push people out of their communities."

She notes that there are paralleling coastal challenges and responses to climate change threats across the world. "We developed and applied a new measure of sense-of-place to rural and urban coastal case study locations in the U.S. and found that some considerations are remarkably similar across the globe. For example, people in rural areas generally have stronger attachments to their community due to greater social cohesion, connections to the land and natural environment, and their cultural identity."

Thinking broadly to meet a complex challenge

Both Bukvic and Resler recognize that the Department of Geography has a crucial role to play in bettering our understanding of the impacts of climate change.

"One of the advantages of the department is that it is highly interdisciplinary," Bukvic said. "We have the necessary skills and expertise to tackle emerging, complex issues such as climate change and coastal resilience across various physical and human dimensions."

Resler, who has led student research and study abroad trips, notes that cultivating an understanding of how various areas of research are interconnected is crucial for understanding climate change. "I love to help students see the big picture. I think it's important to help them navigate broad-concept critical thinking while providing them with hands-on, course-relevant information."

Full story: cnre.vt.edu/fall2020mag

LYNN RESLER

Virginia Tech Geography

UNDERSTANDING WHY THINGS ARE WHERE THEY ARE



LUKE JURAN

THE HUMAN DIMENSIONS OF WATER AT HOME AND ABROAD

For Associate Professor Luke Juran, the human dynamics that inform water ecology is a subject that has local — and global — dimensions. “With competing stakeholders and competing objectives, the challenges surrounding water are extremely complex and require a range of skill sets and viewpoints to tackle.”

Juran’s research has focused primarily on the southeastern Indian state of Tamil Nadu. “There are annual monsoons and tropical storms that bring heavy rain. When there isn’t enough rain there is drought, so you have a place where there is either too much water or not enough.” His research focuses on turning the frequent moments of crisis into opportunities for positive change.

Closer to home, Juran has worked with a team of colleagues to share water science with high school students in Virginia. In a state where one in five households relies on wells, springs, or cisterns, people need reliable testing resources. “We brought high school students from rural communities to campus to do their own water testing while experiencing what life is like at a research university. The exciting part was that we had undergraduates leading the lessons, which was great at making college life feel like a possibility for the high school students.”

When the COVID-19 pandemic shut down the in-person visits, the collaborators switched gears and worked to develop water science kits for home distribution, with a goal of sending 600 kits to Virginia children in the fall.

Juran, who supervised a student who helped develop one of the kit’s lessons as well as two others who conducted research projects, feels that local projects are crucial in preparing Hokies to make an impact on the greater world. “It’s important for faculty to provide students with experiences that get them out of their comfort zones. Asking a student to conduct original research or to develop curriculum and teaching materials is a way to flip the classroom and give them a sense of ownership over their education.” Full story: cnre.vt.edu/fall2020mag



KORINE KOLIVRAS

MERGING EPIDEMIOLOGICAL DATA WITH TECHNOLOGY

Picture a residential neighborhood, the houses built on acres of former farmland. Nearby, a few grassy areas are left to grow wild, leading to patches of forest crisscrossed with walking trails. According to Professor Korine Kolivras, such a landscape is ideal for the spread of Lyme disease.

Kolivras specializes in the field of medical geography. “If we understand geography as the science of understanding why things are where they are, medical geography considers disease outbreaks or health problems within the context of where they are happening and how they move around. We look at spatial patterns to determine the underlying processes that are informing health outcomes.”

She says that understanding the ways that an illness moves is crucial to limiting its spread. “I look at environmental variability and change, and how they impact human health. Geography is the perfect discipline for understanding those variables because we draw on both human and physical conditions to understand health patterns.”

Kolivras has translated a lifelong passion for studying people and places into her research, incorporating geospatial technologies to study the rise in tick-borne illnesses in Virginia and the southeastern U.S. She says that a benefit to working in the Department of Geography is collaborating with researchers at Virginia Tech and at other universities. “The key to understanding spatial patterns is to be able to see them visually and make inferences on the underlying processes that form those patterns from that data. Geospatial tools allow us to do that.”

In all of her work, Kolivras strives to understand the dynamics between people, animals, and the environments where they live. She recently co-authored a paper revealing that development decisions regarding land use and land cover have the potential to reduce the spread of Lyme disease in the Southeast. “We have chosen to create residential developments that have the right mix of land cover characteristics for the Lyme disease transmission cycle. Moving into the future, we can reduce our risk by making different land use planning decisions.”

Full story: cnre.vt.edu/fall2020mag



SANTOSH RIJAL

OPENING THE DOOR TO GEOSPATIAL TECHNOLOGY

With more and more businesses and researchers utilizing geographic information systems (GIS) and remote sensing, Collegiate Assistant Professor Santosh Rijal is ensuring that Hokies can make their mark on the future by helping students from an array of majors gain an understanding of the concepts, applications, and systems that drive geographic information science.

“Geospatial technology is used in many disciplines, from national security and intelligence, to the analysis of emergency preparedness, to figuring out how to best use natural resources and how the climate is changing,” he said. “It has become an essential part of our lives.”

Department Chair Tom Crawford says that Rijal’s extensive knowledge of GIS and remote sensing is an important factor in his ability to reach students. “Santosh is a key instructor in the delivery of the department’s geospatial program, with an impressive ability to explain complex STEM topics in ways that really connect with students.”

Because the range of applications for geospatial technology are broad, Rijal’s classes attract diverse majors. He assigns several group projects, noting that they provide students with critical workforce training, while broadening their base of knowledge. “My students have the chance to communicate with one another. They get to share their knowledge about geography or meteorology or engineering, and the ways that GIS impacts their field. They can take that practice and carry it into their careers.”

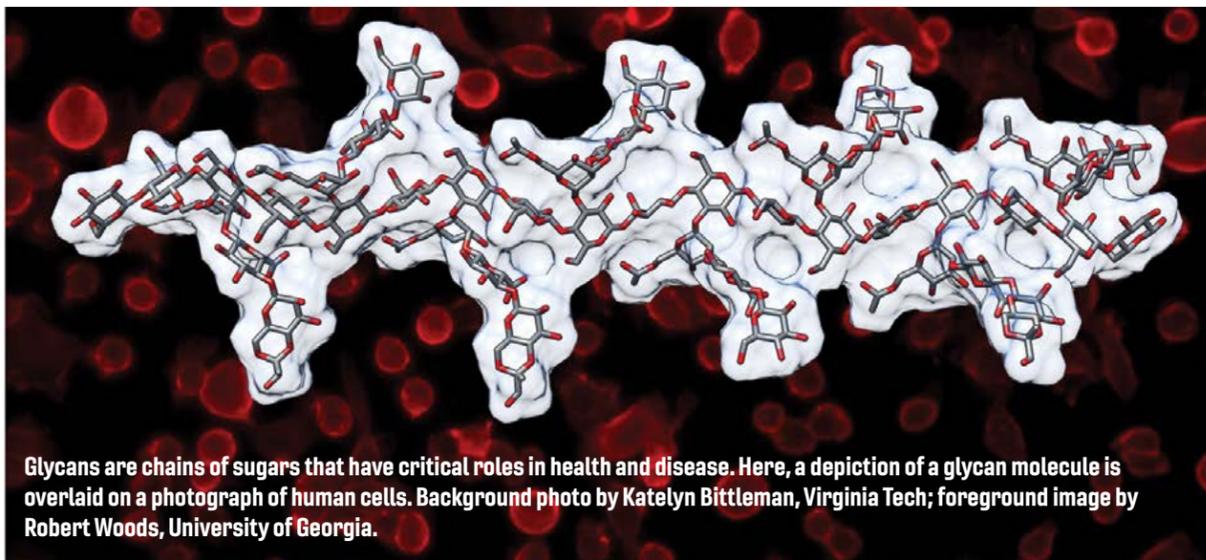
Rijal is optimistic that Virginia Tech can take a leading role at bringing students into the field. “I believe geospatial science has a bright future here. A lot of organizations are looking for people with backgrounds in GIS and remote sensing. I’m excited to see us expand our opportunities in geospatial technology, and I look forward to being involved in the next steps we take.” Full story: cnre.vt.edu/fall2020mag

MAREN ROMAN LEADS \$23M PARTNERSHIP to accelerate glycomaterials research

Glycomaterials, produced by every living organism, contain chains of sugars, called glycans, that have critical roles in health and disease. Of the four building blocks of life — glycans, proteins, lipids, and nucleic acids — glycans are the most complex and are the most challenging to understand. The tool set for understanding these glycans lags far behind those available for understanding DNA, RNA, and proteins.

The National Science Foundation has committed \$23 million to a new partnership, led by Associate Professor Maren Roman of the Department of Sustainable Biomaterials, that will bring together leading scientists and engineers from Virginia Tech and four other universities to establish an NSF Materials Innovation Platform known as GlycoMIP. One of only four NSF Materials Innovation Platforms, GlycoMIP will address nationwide bottlenecks in glycomaterials synthesis, computer modeling, material characterization, and knowledge sharing through groundbreaking research and a unique national user facility that will provide critical tools and services to the scientific community.

The user facility, the first in the country to house automated glycan synthesizers, will be operated jointly by Virginia Tech and the University of Georgia's Complex Carbohydrate Research Center. "By combining our analytical capabilities, we will have the nation's



Glycans are chains of sugars that have critical roles in health and disease. Here, a depiction of a glycan molecule is overlaid on a photograph of human cells. Background photo by Katelyn Bittleman, Virginia Tech; foreground image by Robert Woods, University of Georgia.

most advanced analytical tools for glycomaterials characterization," Roman said.

GlycoMIP researchers will harness the power of artificial intelligence and machine learning to make glycomaterial synthesis, modeling, and data analysis more accessible to the scientific community and provide urgently needed resources to advance data science.

"The GlycoMIP project is very timely given the current COVID-19 pandemic. Understanding the role of glycans in the ability of the coronavirus to reach and enter the cells in the lungs could hold the key to developing effective vaccines and protective materials," Roman added.

Full story: cnre.vt.edu/fall2020mag

Hokie hooked on storms: sharing his passion and building a following

Dark clouds gather, the wind picks up, and the temperature drops perceptibly. Thunder rolls in the distance, and then a bolt of lightning illuminates a nearby mountaintop. For most people, these are signs to take cover. For **Peter Forister** ('19 B.A.), it's time to grab a camera.

"Ever since I was a kid, I loved the thunderstorms and hail, and as I grew up that matured into wanting to understand weather systems as a whole." At Virginia Tech, Forister majored in geography and minored in meteorology — a combination that offered the opportunity to learn about utilizing geographic information systems (GIS) technology to provide a perspective for meteorological science.

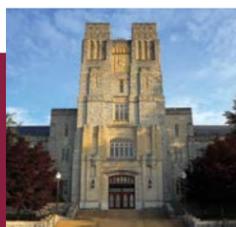
Along the way, he realized that social media was a way to connect with likeminded weather enthusiasts, building an online presence that has garnered him national attention: he has had several mentions in the Washington Post and local weather broadcasts. Forister also uses social media to showcase his skills as a photographer, an interest that grew out his time spent storm chasing, including two trips with the Hokie Storm Chasers.

"I try to use a scientific approach to what I post on social media, but also an artistic one. Where I really get enjoyment is having the chance to share my art and see it improve over time. It's just another way to share my passion about this field."

Currently pursuing a master's, Forister is researching the use of GIS technology to understand how tornadoes impact landscapes by creating maps showing scars in forest vegetation. When he graduates in the spring, he plans to merge his passion for weather with his background in GIS technology. "There are a lot of new industries and places where those skills sets can merge, and I'm excited to see where I go next." Full story: cnre.vt.edu/fall2020mag



Peter Forister photographs a shelf cloud moving into Charlottesville, Virginia, in May 2018.



STAY IN TOUCH WITH VIRGINIA TECH AND CNRE

The **Virginia Tech Daily Email** is your connection to both the university and the college. Delivered Monday through Friday, it includes the latest news, videos, campus notices, and events, with extensive links for detailed coverage. To subscribe, visit vtnews.vt.edu/email/sign-up.

John Seiler reappointed as ALUMNI DISTINGUISHED PROFESSOR

John Seiler, The Hon. and Mrs. Shelton H. Short Jr. Professor of Forestry, has been recognized as an embodiment of Virginia Tech's land-grant mission through his recent reappointment as Alumni Distinguished Professor. Seiler's four-decade career includes significant accomplishments and honors in teaching, research, and outreach.

To students, alumni, and the public, Seiler is affectionately known as "Dr. Dendro" (dendrology is the scientific study of trees). According to Jay Sullivan, chair of the Department of Forest Resources and Environmental Conservation, it is Seiler's passion and dedication to students and to teaching that stands out among his many contributions. "John has educated a generation of students in dendrology and forest biology, and even though his dendrology lab is known as the toughest one-credit course on campus, he is beloved by his students — who can't miss knowing that he cares."

Seiler's reach goes far beyond campus, including a plethora of educational materials, fact sheets, and other tools available to the public. He co-developed the online tutorial Woody Plants of North America, used by both students and professionals across the continent. The free vTree app he co-developed has become one of the most widely downloaded tree identification tools on the market. He personally answers every email — estimated at five to 10 per day — submitted through the app.

When asked to reflect on his time at the university, Seiler said, "Nearly 40 years ago when I arrived at Virginia Tech as a Ph.D. student, I never thought I would spend my career here. I have been blessed and very fortunate to be a part of making CNRE the number one program in the nation. I have constantly been surrounded by a great team of people." **Full story: cnre.vt.edu/fall2020mag**



Aumni honors

- Edwin J. Green** ('81 Ph.D.) received the 2020 Graduate of Distinction Lifetime Achievement Award from the SUNY College of Environmental Science and Forestry, where he earned his bachelor's and master's degrees. Green, a professor of natural resource biometrics at Rutgers University, has done "pioneering work in statistical analysis of environmental science and forestry data, inspiring and teaching students, serving his university and professional societies, and reflecting well on his alma mater," in the words of Professor Harold Burkhart, who nominated Green for the award, adding that "he has truly made a difference."


- Four alumni were honored by the Society of American Foresters this year: **David Bruce Powell Jr.** ('92 M.S.) was named an SAF Fellow, **Peter Bettinger** ('87 B.S., '89 M.S.) earned the Carl Alwin Schenck Award for outstanding service in forestry education, **Shelby "Lee" Spradlin** ('73 B.S., '75 M.S.) received the John A. Beale Memorial Award for volunteer service to the society, and **Jonathan Kays** ('85 M.S.) received the Technology Transfer Award.
- Stephen Schoenholtz** ('83 M.S., '90 Ph.D.) received an Outstanding Alumni Award from the Forest Resources Alumni Group at The Pennsylvania State University, where he earned his bachelor's degree in 1979. Schoenholtz, a professor of forest hydrology and soils here in the College of Natural Resources and Environment, serves as director of the Virginia Water Resources Research Center. Among his many accomplishments at Virginia Tech, Schoenholtz led the effort to implement an interdisciplinary degree in water: resources, policy, and management, the first of its kind in the U.S.



Faculty briefs

- James "Jim" Campbell** received the 2020 Lifetime Achievement Award from AmericaView, recognizing his decades of national engagement with the organization, his leadership of the VirginiaView program, and his overall contributions to remote sensing research. The goal of AmericaView, a nationwide university-based and state-implemented consortium, is to support the many beneficial uses of remote sensing in service to society through research, education, workforce development, and technology transfer.


- Adam Downing** and **Jennifer Gagnon** were elected Fellows of the Society of American Foresters, a rank given to those who have demonstrated excellence in volunteer involvement, consistent leadership, and advancement in forestry by education, public policy, research, or technology transfer. Downing, a senior extension agent, and Gagnon, an extension associate, both serve Virginia's forest landowners through the Virginia Forest Landowner Education Program and other Virginia Cooperative Extension outreach efforts.



- William Hopkins**, wildlife professor and founding director of the Global Change Center, has been named associate executive director of Virginia Tech's Fralin Life Sciences Institute. He will help develop and implement the vision and strategic directions for the institute to tackle grand life science challenges at the interface of the environment and



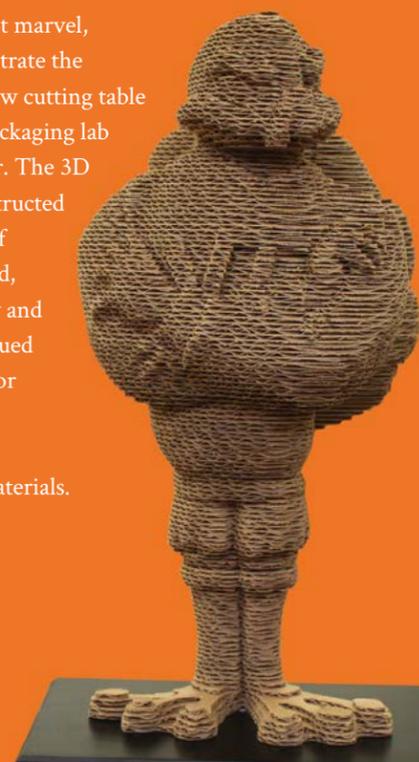
the human condition, including identifying strategic opportunities that leverage and capitalize on existing expertise and infrastructure at Virginia Tech.

- Robert "Bob" Smith** co-authored "International Marketing Practices for Small to Medium Sized Forest Products Firms" with Omar Espinoza (his former grad student) and Anna Pitti of the University of Minnesota. The objective of the guide, the third in a series geared to small and medium sized forest products firms, is to provide easy-to-use information on how to systematically think about factors critical to a successful overseas operation and outline an applicable marketing strategy to enter international markets.



Behold, a corrugated HokieBird!

Check out this 2-foot marvel, produced to demonstrate the capabilities of the new cutting table purchased for the packaging lab at the Brooks Center. The 3D HokieBird was constructed of dozens of layers of corrugated cardboard, each cut individually and then meticulously glued together by Instructor Eduardo Molina in the Department of Sustainable Biomaterials.



News from around the college

Catastrophic disease events in marine mammals

Infectious disease-induced mass mortality events are known to afflict a variety of species, including invertebrates, birds, fish, and mammals. However, these events in aquatic mammals are understudied compared to their land-dwelling counterparts. Research Associate Claire Sanderson and Professor Kathleen Alexander found that such mass mortality events occurred in 14% of marine mammal species between 1955 and 2018. Viruses were responsible for 72% of the events and caused 20 times the number of deaths than bacterial outbreaks. They determined that 61% of the mass mortality events occurred during periods in which regional sea surface temperature anomalies occurred. “As climate change intensifies, this may set off a complex chain of events that dramatically alter these ecosystems, affecting marine populations living in these environments,” Alexander said. The study also found that 37% of the species that suffered a mass mortality event were listed as endangered or vulnerable to extinction. “Addressing the root causes of climate change will be of critical importance as we chart a path forward in managing these species,” Sanderson said. **Full story: cnre.vt.edu/fall2020mag**



Photo courtesy of Nigel/Adobe Stock.

Tuberculosis vaccine may limit COVID-19 deaths

Research by Assistant Professor Luis Escobar and two colleagues at NIH suggests that Bacille Calmette-Guérin (BCG), a tuberculosis vaccine routinely given to children in countries with high rates of tuberculosis infection, might play a significant role in mitigating mortality rates from COVID-19. They collected coronavirus mortality data from around the world and adjusted for variables such as income, access to education and health services, population size and densities, and age distribution. A correlation held showing that countries with higher rates of the vaccinations had lower peak mortality rates from COVID-19. Escobar stresses that the team’s findings are preliminary, and that further research is needed to support their results and determine next steps. “The purpose of using the BCG vaccine to protect from severe COVID-19 would be to stimulate a broad, innate, rapid-response immunity,”



2019 photo

said Escobar, who noted that the BCG vaccines have already been shown to provide broad cross-protections for a number of viral respiratory illnesses in addition to tuberculosis. **Full story: cnre.vt.edu/fall2020mag**

Collaboration helps restore, protect endangered salamander

In spring 2020, young salamanders emerged from two Florida wetlands, the result of a long-term collaborative recovery effort between Virginia Tech, Eglin Air Force Base, and other partners. The project has led to an increase in the numbers and distribution of federally endangered reticulated flatwoods salamanders in the Florida panhandle and offers potential new avenues for conservationists to successfully bring back endangered amphibians. In addition to habitat restoration, researchers tried a new method: collecting eggs and larvae from wetlands where they were abundant, holding them for two or three weeks in order to hatch the eggs and gather enough larvae, and releasing them into long-vacant wetlands. Not only were surviving larvae observed on biweekly checks, but metamorphosed salamanders were found in two ponds where they hadn’t been found before, a crucial step towards species self-sustainability. “Conserving genetic diversity across the landscape is important to long-term survival, especially knowing that these populations are vulnerable to climate change and emerging disease threats,” said Professor Carola Haas. **Full story: cnre.vt.edu/fall2020**



2018 photo

Exploring the impacts of mobile phones FOR MAASAI WOMEN

Associate Professor Timothy Baird, who has studied the impact of mobile phones on Maasai communities in Tanzania, focused recently on their impact on women and what empowerment would look like within the specific contexts of Maasai life. The study results show that some concerns are unique to Maasai communities, which are typically patriarchal, while others seem universal. Maasai women typically have multiple roles within family and

...mobile phones can simultaneously empower an individual in one role while disempowering her in another.

community structures; mobile phones can simultaneously empower an individual in one role while disempowering her in another. Baird stresses that it is more realistic to view mobile phone technology as a new arena where tensions between traditional cultural norms and the growing aspirations to engage in a broadly interconnected world continue to play out. Future efforts need to better understand what empowerment would look like within the specific contexts of a distinct culture, and what consequences — positive and negative — are risked when new technologies take root. **Full story: cnre.vt.edu/fall2020mag**



Third Thursday LUNCH & LEARN Webinars

Join us every third Thursday at noon for an in-depth discussion with a faculty expert. Watch for registration details via email and social media.

January 21, 2021
Changing alpine landscapes, with Lynn Resler

February 18, 2021
Burning ring of fire, with Adam Coates

March 18, 2021
Getting your deck ready for spring, with Joe Loferski

April 15, 2021
Who feeds birds and why, with Ashley Dayer

May 20, 2021
This is home—exploring the trees of Virginia Tech, with Jamie King

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