



Michigan
Technological
University

SCHOOL OF FOREST RESOURCES AND ENVIRONMENTAL SCIENCE

RE:GENERATIONS

SUMMER 2018



COMMITTED TO OUR FUTURE STUDENTS, CURRENT STUDENTS, AND OUR ALUMNI.



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A Message from the Dean

DEAR ALUMNI AND FRIENDS,

This is my final message as dean of the School of Forest Resources and Environmental Science. Having served in this capacity for six years and now heading into retirement, I would like to reflect on the growth that has occurred.

Administratively, we created an engagement team consisting of a student recruiter, a professional advisor, and an advancement professional. We also established a School council with representatives from faculty, staff, and students; three student organizations; an associate dean's position; and a director's position for the Ford Center and Forest.

Energy was put into increasing the diversity of our student body, by hiring a full-time recruiter with expertise in working with diverse cultures and establishing an endowment in this area. Our female enrollment has increased; about 45 percent of our students are women and there is a Women in Natural Resources Club. Domestic minority representation remains at less than 5 percent, but with our recruitment focus in urban

areas, we anticipate this number to steadily rise.

To diversify our programs, we added a BS in Natural Resources Management and are awaiting approval of a BS in Ecology—in partnership with the Department of Biological Sciences. We are also proposing an online MS in Natural Resources and a minor in forest biomaterials.

the creation of the Michigan Forest Biomaterials Institute, a statewide nonprofit organization with representation from government, industry, and academia.

We saw substantial change in our Ford Center and Research Forest in Alberta. We combined three major missions (teaching, research, and outreach) into one

THE PEOPLE I LOVE THE BEST JUMP INTO WORK HEAD FIRST WITHOUT DALLING IN THE SHALLOWS AND SWIM OFF WITH SURE STROKES ALMOST OUT OF SIGHT.

**—EXCERPTED FROM "TO BE OF USE"
BY MICHIGAN-NATIVE MARGE PIERCY**

We greatly expanded our advisory board to have a critical mass of people in each of our six programmatic areas.

Yet another area of diversification is the revitalization of the wood science/products program, including rebranding it as "forest biomaterials" and making it a University-wide initiative. Spinning out of this effort was

administrative unit, changed the name to Ford Center and Forest to reflect this integration, and appointed a director. The result was the development of a strategic and business plan and the elimination of debt.

We increased our international reach to China and South Korea, and we will have our

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first exchanges of faculty and students with China this fall.

Thanks to all who have supported our School over the past six years; you have made an impact and are one of the reasons we enjoy a top-10 national ranking in natural resources and conservation. SFRES has a bright future, aided by the fact that associate dean, Andrew Storer, took over as dean on July 1. Andrew has been instrumental in getting us where we are today.

What has impressed me about the SFRES community is how hardworking they are, and how they do work that is useful. My observations of SFRES and this tenet align with my favorite poem "To Be of Use" by Michigan-native, Marge Piercy—give it a read.

Terry L. Sharik

TERRY L. SHARIK

► Seeing birds up close, often for the first time, in FW 3620. Image credit: Erik Flaspohler

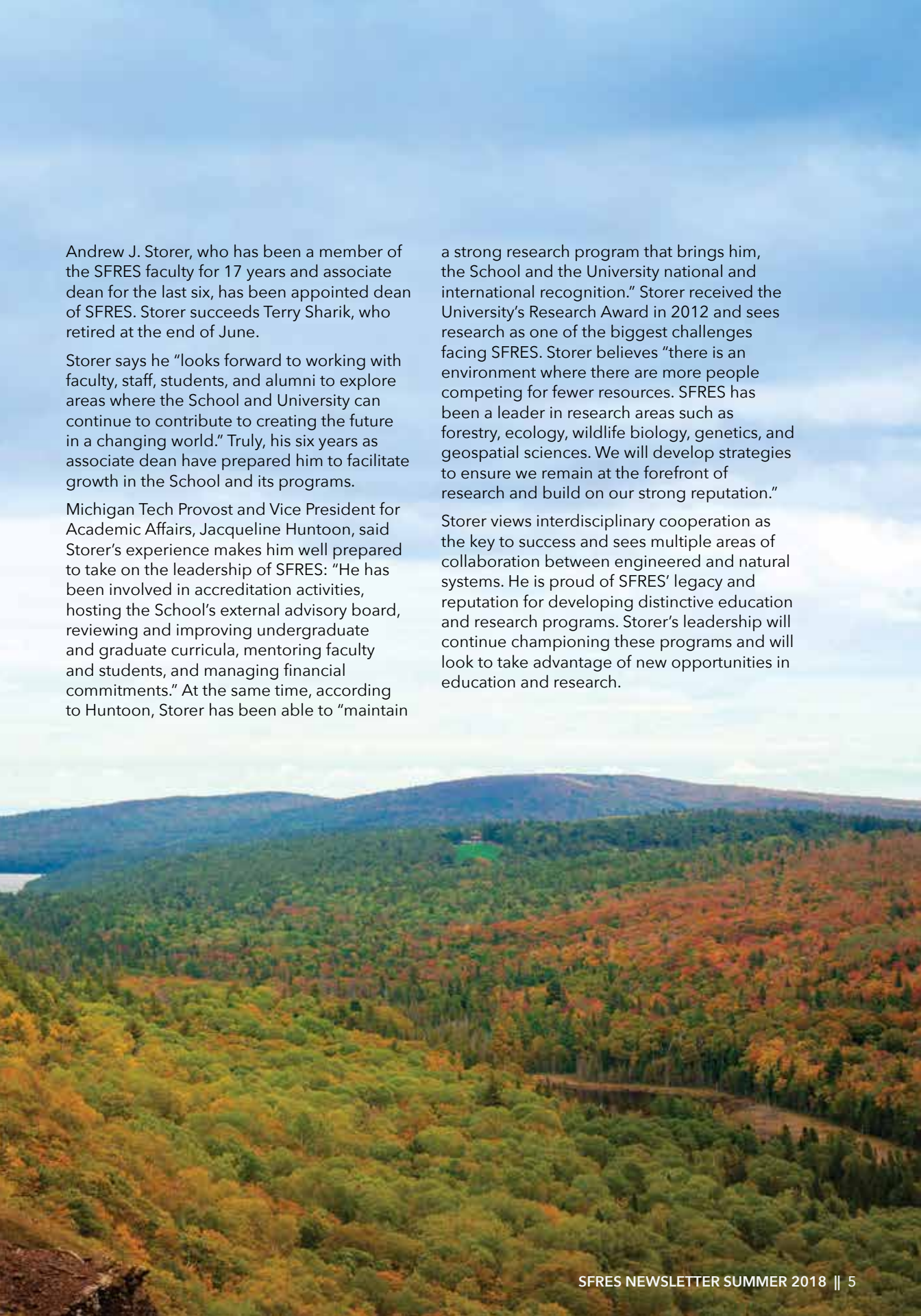




ANDREW J. STORER

Appointed SFRES Dean





Andrew J. Storer, who has been a member of the SFRES faculty for 17 years and associate dean for the last six, has been appointed dean of SFRES. Storer succeeds Terry Sharik, who retired at the end of June.

Storer says he “looks forward to working with faculty, staff, students, and alumni to explore areas where the School and University can continue to contribute to creating the future in a changing world.” Truly, his six years as associate dean have prepared him to facilitate growth in the School and its programs.

Michigan Tech Provost and Vice President for Academic Affairs, Jacqueline Huntoon, said Storer’s experience makes him well prepared to take on the leadership of SFRES: “He has been involved in accreditation activities, hosting the School’s external advisory board, reviewing and improving undergraduate and graduate curricula, mentoring faculty and students, and managing financial commitments.” At the same time, according to Huntoon, Storer has been able to “maintain

a strong research program that brings him, the School and the University national and international recognition.” Storer received the University’s Research Award in 2012 and sees research as one of the biggest challenges facing SFRES. Storer believes “there is an environment where there are more people competing for fewer resources. SFRES has been a leader in research areas such as forestry, ecology, wildlife biology, genetics, and geospatial sciences. We will develop strategies to ensure we remain at the forefront of research and build on our strong reputation.”

Storer views interdisciplinary cooperation as the key to success and sees multiple areas of collaboration between engineered and natural systems. He is proud of SFRES’ legacy and reputation for developing distinctive education and research programs. Storer’s leadership will continue championing these programs and will look to take advantage of new opportunities in education and research.



THE SCHOOL OF FOREST RESOURCES AND ENVIRONMENTAL SCIENCE IS DELIGHTED TO WELCOME THREE NEW FACULTY.



KRISTIN BRZESKI

Kristin joins the School as an assistant professor specializing in wildlife conservation genetics with a focus on canid genomics and hybridization. At Michigan Tech, she will continue to utilize genomic datasets and cutting-edge molecular tools to inform wildlife conservation and management. Kristin completed her PhD at Louisiana State University where she evaluated the consequences of inbreeding in endangered red wolves. After her PhD, she received a National Science Foundation Postdoctoral Fellowship at Princeton University, where she was a leading member of the North American Canine Ancestry Project that researched all things canid—including ecology, evolution, and conservation of North American wolves and coyotes. In addition to her genetics research, over the past four years Kristin has worked with multiple stakeholders in central Africa to protect sensitive wildlife species from illegal hunting and timber extraction. Based on these initial successes, Kristin co-founded the Biodiversity Initiative, a conservation organization that works to build conservation and educational capacity in central Africa. Kristin will integrate projects she developed with the Biodiversity Initiative into her research activities at Michigan Tech. Kristin strives to incorporate her applied conservation work in central Africa and the US into the classroom.



CARSTEN KÜLHEIM

Carsten joins the School as an associate professor specializing in plant-herbivore interactions, the genetic basis of trait variation in trees, and the functional genomics of plant defenses from pests. He joins us after serving on the faculty of Australian National University for 10 years. He completed his PhD at Umea University in Sweden and was a postdoctoral researcher at the University of British Columbia in Vancouver, Canada, for two years where he worked on plant-herbivore interactions using poplar trees as a model system. Carsten has a strong record of scholarly, high-impact publishing, with more than 30 single and co-authored referred publications. In his research at Michigan Tech, he is interested in contributing to the University's connections with industry by engaging in applied science that will benefit local foresters. Having spent more than half a decade in Sweden, Carsten is excited to enjoy winter sports in the Keweenaw.



JARED WOLFE

Jared joins the School as a research assistant professor specializing in ornithology, wildlife management, and conservation. His research uses experimental and observational approaches to determine how environmental change affects bird and mammal community structure and population dynamics in temperate and tropical forests. For the past four years, Jared has worked as a wildlife ecologist for the USDA Forest Service and as research faculty in the wildlife department at Humboldt State University; he developed undergraduate and graduate level courses and conducted research on protected species like the spotted owl and the California condor. While pursuing his PhD in wildlife ecology at Louisiana State University, Jared studied the response of Amazonian bird communities to forest degradation in Brazil. He started the first bird observatory in Louisiana and developed a citizen science monitoring project used to assess impacts of the Deep Water Horizon oil spill on bird populations across the northern rim of the Gulf Coast, which earned him the 2018 President's Award from the Louisiana Ornithological Society. At Michigan Tech, he'll continue championing the conservation and informed management of wildlife through innovative research projects in Michigan and beyond.



NEW CLASS AIMS TO INCREASE DIVERSITY IN NATURAL RESOURCES

In the spring 2018 semester, Valoree Gagnon, instructor in SFRES, created and launched FW 4500—a special topics course called Indigenous Natural Resources Management. The course enrolled undergraduate and graduate students from both SFRES and social sciences. Gagnon said students “were amazingly open-minded and really eager” for the course content. The syllabus explains the course as a multidisciplinary exploration of “Indigenous history, culture, and policy to enhance understanding of the rights and privileges associated with treaties, government-to-government relationships, and the diversity of people, practices, and values within the Great Lakes basin.”

Gagnon says the course meets a critical need in natural resources management and environmental protection: Creating awareness and knowledge of the differences in law for Great Lakes tribal people, which includes recognizing that treaties in the US are the Supreme Law of Land, alongside the US Constitution. Treaties acknowledged Tribes as sovereign nations and as such, established their rights to be

co-managers within the basin. Shared management requires us to consider how “some of our definitions of environmental health or clean water are not necessarily their definitions, and so it’s really about taking a closer look at the diversity of views and values associated with natural resources and environment,” she says.

Eight guest speakers spoke to the class from the Keweenaw Bay Natural Resources Department, EPA Region 5 in Chicago, the Great Lakes Indian Fish and Wildlife Commission, and other Indigenous scholars and teachers. Students also engaged in a guided tour of the natural resources department and hatchery at the Keweenaw Bay Indian Community in Pequaming, Michigan.

“My role in the class was not just about teaching because really, equally, you have to be a learner; facilitating learning is what I think any good teacher should be doing because I assure you, I learned more than I taught them,” she says.

Gagnon’s teaching method is one way she illustrates a style akin to Indigenous or decolonial ideology, which privileges relationship-building, listening, and compassion to others.

Another way she enacted the principles of shared management in a decolonial sense, was through course assessment. Students were assessed in four categories: 1) Reflect and relate, which includes short essays on readings; 2) Engage: to account for students attending and participating in classes; 3) Lead: every student

led one class period; and 4) Research: which includes an extensive, scaffolded research project intended to inform their ongoing and future research needs. Students were held responsible for grading one another’s class facilitation and research presentations. By sharing the responsibility of assessment, students enact a form of shared management and the teacher as sole authority collapses in a true, decolonial sense.

Gagnon recalled a conversation she had with outgoing Dean Terry Sharik: “He approached me about a year and a half ago about some of his ideas for increasing the School’s diversity, and really it comes down to having something real here that diverse students see themselves in. Students are pulled to your school because they can see themselves as part of it, especially in the kinds of courses and programs you offer. He was very interested in courses that are inclusive of Native American management and Indigenous values.” Gagnon says the class was so successful that it is on the books for spring 2019.

In June, Gagnon received the 2018 University Diversity Award, which recognizes her contributions to teaching and partnership building between the University and the tribal communities. She has been appointed director of University-Indigenous Community Partnerships for the Great Lakes Research Center.

A HISTORY OF THE PAST TO PROTECT THE FUTURE:

Rod Chimner's Wetlands Restoration Work Has International Impacts





Rod Chimner's work on peatlands takes him all over the world, but the research at its core has the same goal: Sustainable land use and management.

Chimner and his students, with many collaborators, do research on high-mountain peatlands in the Andes and Colorado, in the densely forested jungle peatlands of Peru and Indonesia, and in the Great Lakes region in Minnesota and Michigan. Each project is focused on developing scientific knowledge and restoration techniques for peatlands that is passed on to scientists and natural resource managers.

Though often viewed broadly as "swamps," peatlands (a type of wetland that accumulates deep organic soil) are the most common wetland type globally and critically important ecosystem for habitat, nutrient cycling, toxin and contaminants removal, and carbon storage. And not all peatlands are the same—they have different management needs. He notes that peatlands store an enormous amount of soil carbon—peatlands store a third of the global carbon despite occupying only 5 percent of the global land area. Burning, draining, or disturbing peatlands releases immense amounts of carbon dioxide into the atmosphere.

Chimner hopes that the research he and his team do will prevent and reverse degradation through better science-driven management. Peatlands are sensitive ecosystems and are not compatible with all land uses, or may require different techniques to remain sustainable.

► At left, a peatland in Huascarán National Park. Below, demonstrating peatland restoration techniques in Indonesia.





FORESTED PEATLANDS

Paludiculture, or using wetland trees for forestry, has long been used in the Great Lakes area with northern white cedar (*Thuja occidentalis*). Cedar swamps are one of the most prevalent and important ecosystems in Michigan; however, northern white-cedar forested swamps are in decline and degraded. Chimner is working with the Michigan Department of Transportation, the US Forest Service, Minnesota state government, and a local mining company to create or reestablish forested wetlands for the benefit of local ecosystems and to promote the growth of northern white cedar.

"If you destroy a wetland in the US by law you have to replace it," Chimner says. "But most people don't create forested wetlands because of how difficult it is."

Chimner developed methodology to create forested wetlands in Petoskey and Escanaba, and learned valuable lessons along the way. For example, the techniques worked well to grow cedar, but the understories are plagued with invasive species. This knowledge informs Chimner's new project where he is developing techniques to establish cedar forested wetlands on mining waste in the Upper Peninsula.

In Minnesota, Chimner is working with scientists to restore cedar in areas where they're not as abundant as they should be. It's a common occurrence along roadways in the Great Lakes region that roads intercept groundwater, causing water to back up on one side of the road. This results in flooding and kills trees. Chimner has worked with road engineers to retrofit roads to allow cross-drainage through the road that restores the hydrology and allows cedar to grow again.

Similar to Michigan, Indonesia is covered by forested peatlands. "Peatlands are a global ecosystem found all over the world," Chimner says. "We know most about northern peatlands. As it turns out there a lot of peatlands in the tropics, but they have been overlooked for a long time because everyone assumed you had to have cold weather to create peat. That's not true, it just has to be kept wet."

However, unlike Michigan, Indonesian peatlands are subject to intense human activity, due to high populations, widespread drainage, illegal and unsustainable logging, agricultural conversion to acacia trees and palm oil, and frequent peat burning.

The US Agency for International Development (USAID) funds Chimner to work with Indonesian counterparts to pursue peatland restoration and paludiculture agroforestry as a way to rehabilitate damaged peatlands. Paludiculture agroforestry combines agricultural and forest production using native wetland plants, for the mutual benefit of farmers and the environment. The goal of the research is to find native wetland plants such as rattan, high-value wetland timber trees, and native rubber that villagers can grow sustainably in peatlands that surround their villages.

Chimner says this is a part of a global movement to more sustainably manage wetlands. On a number of Indonesian islands, he and others met with local people involved in the project so they can learn from each other and build partnerships with communities, managers, government officials, and scientists.

MOUNTAIN PEATLANDS

Peatlands are often thought of only occurring in flat, wet areas. However, Chimner has worked on understanding, restoring, and promoting protection on peatlands that occur in mountain environments for more than 20 years. These mountain peatlands are valuable and provide many benefits including high quality habitat, nutrient sinks and transformations, carbon storage, and areas for pasture. However, peatlands in the mountains are easily degraded because they occur on slopes and erode easily.

In the Colorado Rockies, Chimner works with a group called The Mountain Studies Institute to provide expertise on mountain peatland ecology and restoration, which was also the focus on his PhD dissertation. His ongoing work there for the last 15 years has been focused in the San Juan mountain range in the southwestern corner of the state on peatlands that are degraded by ditching, roads, grazing, and toxic drainage from legacy mines.

In South America, Chimner is part of the Sustainable Wetland Adaptation and Mitigation Program (SWAMP), a project that has been ongoing for five years and partially grew out of a National Geographic Explorer grant that Chimner received in 2005.

An aspect of the project is cataloging wetlands and developing carbon stocks in Bolivia, Ecuador, Peru, and Colombia to help the countries develop baseline data for carbon accounting.

"Nobody had a good handle on how abundant peatlands were in the Andes of South America" Chimner says.

The work has established that, similar to Colorado, the Andes are full of peatlands, some as deep as 11 meters, and that they store large amounts of carbon. Chimner is working with Laura Chavez at the Michigan Tech Research Institute and Erik Lilliskov of the Northern Research Station of the Forest Service to map the wetlands using multi-sensor technology, creating maps they can use to extrapolate carbon sequestration data to spatial extents.

However, during the years of mapping and coring peatlands in the Andes, they also discovered that many of the Andean peatlands are degraded from water development, mining, but especially from overgrazing. Additionally, the Andes are facing increasing impacts from climate change with the tropical glaciers melting at unprecedented rates.

This led to a new NSF-CNH grant with colleges from Peru, Colorado, and Texas working in Huascarán National Park, a UNESCO World Heritage Site and Biosphere Reserve in Peru. The research centers on how non-native but traditional livestock grazing is impacting the fragile mountain wetland ecosystems stressed by climate change, and is leading to cascading effects of cultural and ecological changes.

Chimner and SWAMP colleagues have conducted research on how to restore peatlands in the Andes and held workshops to train local non-governmental organizations on those techniques.

"I've been motivated, having worked in a lot of national parks and in some of the most beautiful places in the world, to help sustain these global ecosystems so future generations can have access to them in a time of unprecedented change," Chimner says.



Better Together: SFRES in Partnership with NIACS



People working together can achieve great things. Michigan Tech has a partnership with the Northern Institute of Applied Climate Science (NIACS), which is celebrating its 13th anniversary. Maria Janowiak '05 '07 and Kristen Schmitt are two individuals who have helped strengthen the partnership. Janowiak is a SFRES alumna and the deputy director of NIACS; Schmitt is a climate change outreach specialist for NIACS and a SFRES research scientist. But Janowiak and Schmitt are not the only members of NIACS with SFRES ties; in fact, several members of the NIACS team are SFRES alumni and six members are Michigan Tech employees.

NIACS is a collaboration between the US Forest Service, universities, conservation organizations, and the forest industry, with the mission to develop synthesis products, foster communication, and pursue science related to climate change and carbon science in forests. Explaining her

history with NIACS Janowiak says, "I started at NIACS in 2007—not very long after graduating from SFRES with my master's. The organization started as a partnership between the US Forest Service Northern Research Station (which has a lab on Tech's campus), Michigan Tech's SFRES, and the National Council for Air and Stream Improvement—a forest industry research group—I was the only person with Michigan Tech ties in the beginning." At the time of its founding, NIACS was "novel in its approach of getting scientific research happening at universities out to the foresters and other land management professionals who needed it for their jobs," says Janowiak. The unique partnership among a public agency, universities, and private organizations is how NIACS has been able to expand its efforts to disseminate cutting-edge research.



"IT HAS BEEN ABSOLUTELY TREMENDOUS HOW MUCH NIACS HAS GROWN OVER THE PAST 10 YEARS AND THAT COULDN'T HAVE BEEN DONE WITHOUT SFRES AND MICHIGAN TECH."

—MARIA JANOWIAK '05 '07, NIACS DEPUTY DIRECTOR

Maria Janowiak is the recipient of the 2018 Climate Adaptation Leadership Award for Natural Resources from the Association of Fish and Wildlife Agencies and other partners. She is recognized in the "Individual

- ▶ **Achievement"** category for her leadership and success in helping natural resource professionals in the Midwest and Northeast understand and adapt to climate change over the past decade, leading to more than 75 demonstrations of climate adaptation in forest ecosystems.



NIACS-SFRES ROOTS

Since its initial staffing in 2007, Janowiak says the staff has grown from two to 19, including nine climate change outreach specialists, six research scientists, two web specialists, and two GIS/lab specialists. In the last 10 years, NIACS has also grown its members to include more universities, non-profits, and a regional tribal organization. About half of NIACS' staff are based out of the Forest Service's Forest Sciences Lab located on Michigan Tech's campus—another indication of how strong NIACS' ties are with SFRES.

A PARTNERSHIP WITH PURPOSE

Janowiak explains, "the big, overarching purpose (of NIACS), is to provide different services to help make climate change science and information more available to land managers and other people who need that information." To this end, NIACS helps "demystify" complex information about climate change by:

- Modeling climate change impacts on forests and ecosystems
- Providing technical assistance to foresters and natural resource professionals to help them adapt forests and other lands to climate change
- Increasing forest carbon research and management

One example of their work is facilitating trainings on climate change to military personnel. In fact, Kristen Schmitt conducts three to four trainings annually for military officers, enlisted personnel, and civilian staff. The climate change modules help service personnel and civilians meet natural

resource compliance requirements on military bases to meet federal regulations.

More recently, NIACS climate change outreach specialist Kailey Marcinkowski has been working with Tara Bal (research assistant professor at SFRES), Andrew Storer (dean and professor of SFRES), and other NIACS staff to develop an online course on climate change and natural resource management. This potential course will be available in the online master's in natural resources currently under development in SFRES.

But teaching is just a piece of the SFRES-NIACS partnership, which fits within the context of a broader program the institute has for climate change outreach and helping people make appropriate adaptations. "NIACS provides technical science and resources to help foresters adapt to climate change. People from SFRES have been thinking about how that could affect management on Ford Forest lands," Janowiak says. That thinking and associated research by SFRES faculty complements NIACS' training and outreach efforts.

A BENEFICIAL BOND

Janowiak says, "There's no way we could have grown as much as we did and have done all we do without the partnership with Michigan Tech. Looking forward, we'll only work more and more with them." SFRES helped create NIACS and grow it into one of the nation's foremost adaptation institutes; NIACS' effectiveness and prominence was recognized in 2016 when NIACS received the National Adaptation Leadership Award. The partnership between NIACS and SFRES is long-lasting and mutually beneficial. Truly, this is a relationship worth celebrating.

Technology in the Woods

The scientific methods by which foresters and environmental scientists approach their work has largely remained consistent over the decades. However, the technology by which they do their work is rapidly changing. These technology changes in turn are taught to students to equip them with the skills they need to thrive in their careers. Here, five faculty members discuss how technology enriches their work.



MOLLY CAVALERI

**Associate professor,
tree physiology**

Ours is a resilient world; when hurricanes devastate landscapes, mere months afterward new growth appears. Also resilient are researchers; when hurricanes devastate research sites, scientists find ways to turn catastrophe into opportunity.

When Hurricanes Irma and Maria carved their destructive paths across the Caribbean, they left behind grieving communities without power, badly damaged homes and infrastructure, and completely altered ecosystems. One of these was the El Yunque National Forest, on the northeastern side of Puerto Rico.

El Yunque is the only tropical forest in the US Forest Service system, which makes it ideal for understanding the effects of climate change where those changes will impact the most. Molly Cavaleri, associate professor of tree physiology in SFRES, is leading Tropical Response to Altered Climate Experiment (TRACE), a Forest Service and the US Department of Energy-funded project, with fellow researchers Tana Wood from the US Forest Service, and Sasha Reed with the US Geological Survey.

She and her team are actively seeking funding to pivot the work using ground-based LiDAR (light detection and ranging) and different sensors—



the hurricane stripped away much of the forest canopy, providing a new, more open view of the forest. Using a combination of remote sensing and ground-based measurements, Cavaleri will be able to study the structural recovery of the forest from the leaf level from an observation tower, from a drone, from an airplane, and from a satellite.

“From infrared gas analysis to satellite data, I’m connecting all the way down to the molecular processes of leaf-level fluorescence,” she says. “I work in a pretty specific scale, but collaborating with people who have access to these methods gives me access to information beyond my expertise.”



CURTIS EDSON

Assistant professor, remote sensing and geospatial information science

Climate change dominates much of the media with respect to the environment; climate change may have significant ramifications in forestry and environmental science. Edson is involved with research that monitors regional climate change impacts.

His current projects include a partnership with EarthWatch to assist Waterton Lakes National Park (Canada) achieve its prescribed fire management objectives, using an unmanned aerial system (UAS)—drones—and photogrammetry to map overlapping prairie grasslands and aspen stands. Edson is also working with Hiawatha National Forest, using drones to map forest wetlands and infestation of the invasive grass phragmites to help forest managers differentiate over large areas of land between a native phragmites species and an invasive species.

Additionally, at the Ford Center and Forest Edson is undertaking a biomass estimation study using LiDAR, hyperspectral imagery, and drone imagery.

“Hyperspectral imagery gives us the ability to identify species. LiDAR gives us ability to do 3-D modeling and provides penetration to capture more of the detailed forest canopy to the ground in a dense forest. The drone enables us to do surface



modeling while capturing high spatial resolution imagery at the same time, and enable a relatively inexpensive and responsive approach,” Edson says.

Using new technologies together in a hybrid approach enable more accurate landscape-scale forest biomass estimations. These are important times to perfect carbon sequestration modeling to keep a watchful eye to monitor climate change effects at landscape scales.

Edson’s work with students includes a new course on remotely piloted aircraft (drone) photogrammetry, which uses overlapping aerial photos to create 3-D models. It’s a technique that’s

been used in the US since the early 1900s and is still relevant today.

"We're coming full circle to these analog techniques," Edson says, adding that it is important students understand practical mathematics in order to understand how computers build models from the overlapping images.

"We can do so much with high tech, but if we don't have a basic understand of how things are done and how to apply them correctly it's garbage in, garbage out. That's the idea behind ground-truthing. We still need somebody to go out and measure things to check what the high tech is telling us. A college student has to understand the theory to confirm measurement accuracy."

ROBERT FROESE

Associate professor and director of the Ford Center and Forest

Few Tech forestry grads will forget the highs and the lows that come with working outdoors, especially long days and bad weather learning how to cruise timber.

Forest inventory requires establishing plots, measuring trees, and transcribing messy field sheets back in the office. Today's expectations for sustainability require collecting even more data to assess ecosystem services, including biodiversity, soils, and cultural values in addition to provisioning of timber.

"Field computers have been part of the forester's toolkit for some time, speeding up the process of collecting inventory data. But until recently, they've been clumsy, expensive, and highly specialized," says Robert Froese. "Now, a tablet in a waterproof case can be had for a few hundred dollars and can run a wide variety of applications, many of which are free."

Companies like SilviaTerra produce inventory apps that can be downloaded onto phones or tablets running the iOS or Android operating systems. If the device has GPS, the app allows users to navigate to a pre-determined location, and input data they collect directly for number-crunching back in the office.

"Every student that goes to fall camp has a field computer. This year, for the first time, I will teach using Plot Hound from SilviaTerra, but they also



have Avenza Maps," Froese says. "Our students have functional GPS and forest inventory systems in their pockets."

But the benefits aren't just in the field. Froese says that SilviaTerra's system lets users design a forest inventory through their website, and then download the plot coordinates automatically to the app. When the cruiser comes back to the office, the data are already uploaded, and the number crunching is complete.

"Technology has made fieldwork more efficient, but better still, it's allowed us to capture so much more detail, which makes today's forester more effective too."

DAVID FLASPOHLER

Professor, ornithology

For decades, ornithologists relied on banding a bird's legs to collect data on the bird's whereabouts. Now, changing tracking technology is greatly expanding the ways ornithologists elucidate a bird's basic life history. Specifically, miniaturization of devices that can be attached to birds has advanced greatly in the last 20 years, allowing researchers to track smaller birds and to gather more data with a single device.

"You used to need a bird the size of a goose or a hawk," says David Flaspohler, professor of

ornithology. "Now smaller transmitters with smaller batteries allow us to place geolocators—a little tag with a sort of backpack with loops that go around the birds' wings—on warblers and swallows."

Geolocators, powered by solar energy, can tell scientists where a bird has been within the last 12 months. To collect the data, the bird must be recaptured, but the geocator can tell a researcher where a migratory bird was in a cloud of latitudinal points based on when the sun rose and set.

"Our ability to track ever-smaller birds with greater accuracy over a larger geographic area of the

planet is one of the biggest revolutionary changes in ornithology," Flaspohler says. "We can link breeding grounds and wintering grounds and we can distinguish populations that breed together in Eastern North America but winter in different parts of Latin America."

Flaspohler says these tools can also aid our understanding of the factors causing endangered or threatened species to decline, such as habitat loss or degradation.

And technological advancements aren't good merely for research scientists, but for citizen scientists and bird watchers as well. Apps like eBird are enabling thousands of people globally to enter data about birds, their behavior, and their migratory patterns.

"Tools like eBird allow the public to collect data in their backyard or while on vacation and easily enter it into a huge data set," Flaspohler says. "Citizen scientists can help address important questions that professional scientists simply cannot address

alone because there aren't enough professionals to do that. For example, when a disease outbreak occurs among birds, it can be spread quickly by social contact at feeders, and reports from thousands of attentive bird feeders can quickly reveal the epidemiology and geographic extent of such outbreaks."

Another direct benefit of the citizen science data sets on eBird is overwhelming evidence that birds are moving in ways consistent with a warming climate.

"Citizen science data has now generated such high-resolution wintering and breeding location data over many years that we can see changes in the boundaries of winter and breeding ranges," he says. "In the north temperate zone, some birds that used to migrate aren't migrating at all, partly as a result of warmer winters. These are patterns that can be seen beyond the anecdote through technology and big data sets."

MIKE HYSLOP

Principal lecturer and Master of Geographic Information Science degree program director

For Mike Hyslop, the biggest change in recent years is the availability of vast amounts of natural resource data, and new tools to both access and supplement it.

"What natural resource people do in the woods hasn't changed over time," Hyslop says. "They need to know whose land they are on and how to get to their plots efficiently. Once there, they have trees to measure or mark and habitat to assess. That's been a pretty constant part of fieldwork for over a century. What's changed is the type of data available—such as aerial photos, satellite imagery, cover type, or soils data—that's more detailed, updated more frequently, and easier to access in the field."

GIS (Geographic Information Systems, used for managing spatial data) and GPS (Global Positioning System receivers) have been game changers for the natural resource management field. A \$100 GPS tells a person where they are within 10 feet. A smartphone has similar accuracy, and it has become relatively common to use a custom map in a smartphone app to help guide fieldwork.

"We use these tools because they're labor-saving devices," Hyslop says. "You can do things you couldn't do as easily with a paper map or other types of tools. Paper maps are fine, but typically show only one variable, and these maps are updated infrequently. Custom maps let us combine



different types of data that are useful for different tasks, and can include the latest information from recent fieldwork. Not only do GPS units show us where we are on the landscape, they can also be used to collect points of interest, mark boundaries, or store cruise or plot data."

Hyslop noted that beyond using new tools to produce data about forests, faculty in the School equip students to make smart decisions about the tools they use.

"We try to turn out well-trained students who are adaptable and can use new technology as it comes along," he says. "We're not just teaching students to use a particular GPS unit or mapping software. We are grounding them in the basics—how and why these tools work—and how to think spatially. This should let them apply their knowledge to effectively use new tools as they are developed."

MEGAN BAKER '15



WILDLIFE BIOLOGIST FOR USDA WILDLIFE SERVICES

Megan Baker isn't afraid to leave her comfort zone. As a wildlife biologist for the USDA Wildlife Services, Megan has circled the globe—working in Alaska, the Arctic, the Baltics, Southeast Asia, and near home in southeastern Michigan—and it's only been three years since she graduated with her bachelor's degree in wildlife ecology and management from Michigan Tech.

After Michigan Tech, Megan gained her expertise in airport wildlife assessment with the USDA Wildlife Services in Alaska. "That's where I was the first six months after graduation," she explains. At first, being so far away from home wasn't easy. But instead of heading home, she traveled even farther away—volunteering to work in South Africa for two months. She returned to Alaska for the year to "learn the ins and outs of how to manage on an airfield." From there, she answered another call for volunteers, and another.

Trading Lake Superior shoreline in 2015 for Lake St. Claire in 2017, no two days on the job are the same—and Megan wouldn't have it any other way. Since December, Megan has managed wildlife at Selfridge Air National Guard Base, located near the bottom of Michigan's thumb. Megan's responsibilities include habitat assessment—identifying the food, water, and cover that might be attracting wildlife and modifying the habitat to keep aircraft and wildlife safe. In June, Megan accompanied the Michigan Air National Guard to the Baltics to help the Latvian military with their wildlife management.

When reflecting on her short but impressive career, she admitted to experiencing homesickness and the rewards of leaving her comfort zone, saying "I had no idea I was opening the door to so many opportunities while I was at Michigan Tech. I would have never guessed what I would experience." Megan wants other Michigan Tech undergraduates to take a leap of faith. Apply for a job they are slightly underqualified for or volunteer to work abroad. As she learned from her experience at Michigan Tech: Big risks yield big rewards.



ANDREW ROBERTSON

How do you capture a dog's personality in a single photo? That's a question junior Andrew Robertson tries to answer in his spare time. Using his photography skills, Andrew helps dogs at the local Humane Society find forever homes.

This is not the first time that Andrew has spent behind the camera. For six and a half years, he was a combat documentation/production specialist or "combat camera" in the US Army. Andrew was responsible for photographing military training and combat situations at Fort Bragg, North Carolina, and Fort Lewis, Washington. He was also deployed three times to the Philippines, Qatar, and Iraq.

After his service, Andrew chose Michigan Tech to be closer to family. He was also attracted to the friendly SFRES faculty, the fall camp curriculum, and the proximity to Isle Royale and the Ottawa National Forest.

Funding from the Veterans Administration allows Andrew to concentrate on his studies and research in both forestry and wildlife ecology and management. He worked with Xinfeng Xie on his composite lumber panel during summer 2017, and will work with Evan Kane on the effects of fire intervals in peatlands on the Ottawa and Hiawatha National Forests in summer 2018. Andrew plans to use his dual degree and experiences to start his own land management consulting firm working with private landowners to implement wildlife and conservation practices. Meanwhile, Andrew spends time in the woods with Waylon, his adopted pit bull—sometimes a dog captures the heart of a photographer.



JOHN "MOOSE" HENDERSON '18

Award-winning wildlife photographer with more than 11,000 published images. Five-time published author. More than two decades as a laboratory scientist. Prior to returning to school, Moose spent two years in Siberia photographing wildlife. In addition, he volunteered at Muraviovka Park near Blagoveshchensk, Russia, helping with endangered cranes.

Moose left Russia in 2010 and obtained his MS with a concentration in wildlife biology from the University of Nebraska. He came to Michigan Tech in 2012 to obtain his PhD in forest science, focusing on moose winter foraging and microhistology.

Moose says he will use his "degree in conjunction with my wildlife photography to help educate others about the plight of animals, conservation, and the environment through presentations, teaching at nature centers, and writing books."

Immediately after receiving his doctorate degree, he headed to the Yellowstone Ecosystem to pursue research for his sixth book *50 Wildlife Hotspots in Yellowstone National Park*. His previous books include three scientific books (microhistological atlases), a safari guide, and the recently released *50 Wildlife Hotspots in Grand Teton National Park*.

Prior to leaving campus, Moose donated a display of his wildlife images for the basement area of Horner Hall in the Noblet Forestry Building.

MARIA KRIVOVA



PHD STUDENT, FOREST SCIENCE

How far would you travel to pursue a passion? Maria Krivova, a second-year PhD student of forest science, traveled from Russia with her husband, three children, and two-year-old German Shepherd, Rover, to pursue her unrelenting passion for photogrammetry, remote sensing, and GIS. Photogrammetry is the science of making measurements from photographs.

Geographic information systems (GIS) store all collected information (including remote sensing and from fieldwork), check, display, and process data related to the Earth's surface. At Michigan Tech, Maria is using the method to estimate tree biomass through the process of calculating the number of trees in a forest. If her research sounds overly ambitious, you should get to know Maria—a woman not short of ambition.

"It is so important to do what you really want to do. I'm excited to be here. Forestry is like a big family," she says.

Maria's passion for photogrammetry ignited during her studies at the Siberian State Academy of Geodesy. Upon graduation, Maria had the opportunity to teach at the university and begin pursuing her PhD. However, she was forced to put her education and career in the field on hold. Maria worked for more than 10 years in marketing while she raised her three children. Though Maria was good at her work she claims she "always felt like something was missing. I felt I wanted to return to my profession but it felt too late to return to it. One day I said to my husband I couldn't stand it anymore, I want to return to my profession." And so she did.

Maria began studying old textbooks and reading new research articles in the field to prepare for her return to photogrammetry. She even took an online course on GIS from the University of California, Davis. She translated articles into English to improve her English skills. Finally, in October 2017, Maria and her family arrived in Houghton and she dove into her passion as a full-time forest science graduate student.

Summer Field Ornithology Class in its 20th year

By David Flaspohler, professor of ornithology



FIELD ORNITHOLOGY (FW 3620) IS AN UNUSUAL CLASS FOR ME FOR A VARIETY OF REASONS:

- 1) It is taught in the summer over a single weekend;
- 2) We are in the field the entire time—camping over chilly May nights in remote corners of the UP;
- 3) It attracts mostly non-SFRES majors from across campus, from the School of Business and Economics, to humanities and computer science.

This year, I had five Michigan Tech varsity hockey players, three varsity women's basketball players, a former Michigan Tech football cornerback, and a women's cross country team member. Only one student had taken my four-credit spring semester ornithology course. Most students had never watched birds through binoculars in their lives. The great challenge was how to introduce a highly diverse group of Michigan Tech students to bird biology and identification in 48 hours without overwhelming them.

My primary goal for the class is to show young people how wonderful birds are and how rewarding it can be to notice, watch, listen, and understand their behavior and biology. Birds give back so much in terms of aesthetic beauty, the wonder of flight, and the annual renewing miracle of migration. And by visiting the places where birds live, students see so many lovely corners of Michigan—from the Fox River, where Ernest Hemingway fished in the 1920s, to the thundering spring flow at Tahquamenon Falls.

Two days outdoors, in a part of the country that still lacks good cell phone service, draws the students out of their comfort zones (literally, when nighttime temperatures dip below freezing and they realize the sleeping bag they brought was not up to the task!) and away from their smart phones. Between Friday afternoon and Sunday evening when we return to Houghton, I see a lot of personalities open up and a lot of joy. With luck, they are left with a new appreciation for birds and the value of healthy ecosystems.



► David Flaspohler, center front, Tahquamenon Falls (above).



Making Tracks . . .

1 The William G. Jackson Center for Teaching and Learning presents annual Distinguished Teaching Awards, which recognize outstanding contributions to the instructional mission of the University. Twelve finalists were chosen, three were SFRES faculty!

Congratulations,

**ANDREW BURTON,
ANN MACLEAN, AND
CHRIS WEBSTER**

All three were selected in the associate professor/professor category and were chosen based on more than 50,000 student ratings of instructors.

2 Mike Hyslop, principal lecturer in SFRES, was nominated by Dean Sharik for the Dean's Teaching Showcase—a Michigan Tech honor given to faculty or instructors who have shown exemplary teaching and curriculum development within their field. Mike has been at Michigan Tech for more than 20 years in a variety of roles, all of which have included a significant teaching component in the area of geographic information systems and geospatial science. He coordinates the GIS master's degree program and our Integrated Field Practicum (summer and fall camps), in addition to being an instructor for that program.

"The geospatial arena is very important in the graduation of students who have a distinctive skillset that sets them apart from graduates of other programs. Mike is an important component of the high-quality instruction in the geospatial sciences that SFRES prides itself in," says Andrew Storer. Says a former student, "Mike has a great ability to communicate to the students in a language that is easy to understand. For GIS that is important because it is a unique platform that has language barriers.

In addition to his ability to connect, he does a fantastic job at making something like GIS interesting. Mike is helpful and always willing to work with his students with any challenge. His ultimate goal is to teach students so they learn the subject and he achieves that task well and with grace."

3 Jared Wolfe, our newest research assistant professor, was awarded the 2018 President's Award from the Louisiana Ornithological Society. The award recognizes his contributions to bird conservation and science in the state of Louisiana. Specifically, he created the first bird observatory in the state of Louisiana in 2010. The Observatory now operates five permanent bird banding stations throughout the state and coordinates annual environmental outreach programs for Louisiana youth. To date, more than 1,000 children have participated in Louisiana Bird Observatory's environmental outreach program where they learn about wildlife and habitat conservation. We look to continue those efforts in the Upper Peninsula!

4 Kathy Halvorsen, professor in SFRES and Social Sciences, won the 2018 Graduate Student Government Graduate Mentor Award, shared with Chelsea Schelly (Social Sciences). SFRES alumni Will Lytle won the 2018 Graduate Student Government Student Leader Award.

5 In April, the Michigan Tech Student Chapter of the Wildlife Society visited the North American Bear Center and the International Wolf Center in Ely, Minnesota. At the International Wolf Center, students toured behind-the-scenes and watched the wolves being fed. On the way home, they stopped at the Sax-Zim bog near Duluth for additional wildlife viewing opportunities.



Jared Wolfe



From left: Kathy Halvorsen, Jenny Dunn, Will Lytle, Chelsea Schelly





IN MEMORIAM



JAMIE ANTONIEWICZ '90

Jamie passed away on October 4, 2017, at his home in East China Township, Michigan. He was able to nurture his love for the outdoors in his job with the USDA National Resources Conservation Service until his retirement in 2011. Jamie and his wife Irene, celebrated 30 years of marriage and had two sons. Jamie loved riding his motorcycle and caring for his canine companions.



MICHAEL S. COFFMAN '83

Michael passed in June 2017 at his home in Bangor, Maine. Michael was a professor in SFRES from 1970-1983. His courses and research focused on forest ecology and forest community dynamics. A true steward of environmentalism, he assisted the US Forest Service in developing an Ecological Land Classification System for each of the National Forests in Region 9, which spreads across 17 national forests in the East and Midwest. Michael also played a key role in stopping the ratification of the Convention on Biological Diversity (Biodiversity Treaty) in the US Senate. Michael served on the executive board of Environmental Perspectives Inc. for several years and published influential books and articles.



RALPH DUDDLES '62

Ralph passed on February 23, 2018, in Coos Bay, Oregon. He advanced his love of forestry after receiving his Bachelor's in Forestry at Michigan Tech, by pursuing graduate studies at the University of Washington. Upon graduation, he worked as an extension forester for Oregon State University until retiring in 2002. As part of his job responsibilities, Ralph participated in the school's forestry program and assisted local landowners with land management. Ralph enjoyed traveling internationally with his wife of 50 years and cultivating a love of learning and nature conservation in his children and grandchildren.



EDMOND HOLM '52

Edmond passed on January 1, 2018, in Redwood City, California. After receiving his Bachelor's in Forestry from Michigan Tech, he taught biology, horticulture, field biology, and desert ecology at San Mateo High School. In his retirement, he shared his expertise with customers at a local nursery. He wrote a monthly newsletter, gave garden consultations, and designed landscapes. Edmond was an active volunteer of the Saratoga Horticultural Foundation, California Horticultural Society, California Native Plant Society, and the International Oak Society.



JACQUES JORGENSEN '52

Jacques passed away December 14, 2017. Jacques graduated from Michigan Tech's forestry program in 1952 and went on to complete his PhD in Soil Science at the University of Minnesota. He spent his career as project leader and soil scientist for the USDA Forest Service at the Southeastern Forest Experiment Station in North Carolina. In 1986, Jacques wrote the well-known report "Foresters' Primer in Nutrient Cycling." Jacques and his wife, Vann, endowed a scholarship in SFRES, which provides support for many forestry students each year.



RICHARD D. "DICK" LINDBERG '56

Dick passed away on April 8, 2018, in Oregon, Wisconsin. He proudly served in the US Army during the Korean War and used his GI Bill to earn his BS in Forestry from Michigan Tech in 1956. Following graduation, he began work with the DNR—first in northern Wisconsin, before working as forestry planner until his retirement in 1989. He and his wife, Pat, enjoyed traveling and were involved in church. Dick enjoyed outdoor sports and volunteered with AMVETS. He had two sons and five grandchildren.



MICHAEL MASSIE '60

Mike completed his Bachelor's in Forestry at Michigan Tech and went on to complete his PhD. He died peacefully at his home in British Columbia, Canada, on December 6, 2017. Mike worked as a forestry economist for the government of Canada and a consultant until retirement. Mike was ill for many years, yet hung on for a year and a half after his last dire diagnosis. His wife, Rosanna, says she admired his incredible determination to stay alive. He is survived by his wife and daughters Sheila, Colleen, and Elena, and seven grandchildren.



BERNARD J. MAYER '57

Bernard passed away on April 15, 2018, from heart complications. Originally from Sheboygan, Wisconsin, he and his wife, Juanita, traded lakes for mountains and had three sons. He used his GI Bill to obtain a BS in Forest Management from Michigan Tech, which served him well in his career with the Bureau of Land Management for western Oregon regions. In his retirement, he raised Shiitake mushrooms and enjoyed hunting, fishing, and gardening.



THOMAS JOSEPH ROZICH '65 '75

Tom passed away at his home in Lac LaBelle on April 6, 2018. Tom was a devoted conservationist, and was steadfast in sharing his knowledge and passion for the benefit of Michigan's environment. Tom received both a Bachelor's and Master's in Forestry from Michigan Tech. Tom worked for the Michigan Department of Natural Resources for 36 years, during which time he led conservation initiatives across the state focused on fisheries and Great Lakes protection. Upon retirement in 2008, Tom was appointed by the Governor of Michigan to serve as an advisor for the Great Lakes Fishery Commission. He enjoyed sharing his stories and knowledge of nature with friends and acquaintances. His stories were frequently featured in the *Daily Mining Gazette* as "Biological Bits." Tom's three children have plans to fulfill his dream of publishing a collection of his columns in order to share his knowledge with future generations.



ART WIDERSTROM '67

Art passed away on November 7, 2017, in Arizona. Art's 47-year career with the Division of Forestry was storied. During his career, Art held several positions which took him across the state of Minnesota. In both his professional and personal life, Art championed a passion for forestry. For more than a decade, Art was responsible for selecting and delivering a Christmas tree to Minnesota's state governor. He also advised 4-H and Future Farmers of America forestry teams. Known by many teachers as "Uncle Art," he donated much of his time instilling in children a love for forestry, which all stemmed from his undergraduate education in forestry at Michigan Tech.



CRUISING TIMBER, ICE, AND LIFE LESSONS

We were cruising timber one time during winter break in 1967. There was a lot of snow in the forests—it was at least six feet deep, so we were using snowshoes. I was with another student who was a senior. Gene A. Hesterberg and Helmuth M. Steinhilb—whom everyone called Hammer—were each cruising by themselves. We were in an area where we would have to cross a stream on the inbound and outbound cruise lines. Gene told us not to cross the stream unless there was a fallen tree nearby lying across the stream that was large enough to get across on safely, because, even if the stream was completely covered with ice and snow and the ice appeared to be thick enough to hold a person, there could be a warm spring under the ice, which would make it thinner. If we couldn't get across on the inbound cruise line, then he told us just to estimate the density of the forest on the other side of the stream.

When my partner and I returned to trail, we walked in to start our cruise lines and we noticed that someone had gotten out to the trail before us and had a huge amount of ice in his snowshoes. The tracks from the ice-packed snowshoes were wide apart, so he was running. When we arrived where the cars were parked, there was a message from Gene on the driver's side window of Hammer's car noting that Gene had fallen in the stream and was going to Hammer's house, which was closer than the university, so we should drive there.

When Hammer returned to where the cars were parked, we drove to his house. Gene was inside

the house covered with a blanket and his soaked clothes were hanging where they could dry.

Gene told us that when he got to the stream on his outbound cruise line, there was no fallen tree for him to cross. The stream was pretty narrow there and completely covered with ice, so he decided to poke on it to see if it would be safe to cross (which is what he had told us not to even think about doing). He said the ice was very hard, so he decided to cross the stream. He said he reached the middle of the stream and the ice broke. Gene fell in and went completely under water and drifted under the ice pack. He couldn't see the hole in the ice where he fell in, but luckily he was able to find it and get out.

My partner and I, and Hammer, had safely crossed the stream on fallen trees. Gene didn't follow the directions he had given us. He said that was a big mistake and he was lucky to be alive. Gene said he should have gone upstream or downstream to where there was a fallen tree to get across, like the rest of us had done.

He told us, Let this be a lesson that you will never forget: If you tell others not to do something, you shouldn't do it either.

Gene and Hammer were both very good instructors and very good guys. I have remembered both of them and the things they taught me. I almost got Helmuth to tell me how he got the nickname "Hammer," but he never did.

—Joseph T. (Ted) Weber Jr., '68 Forestry

Alumni Reunion

2018

Michigan Tech.
Forester
Class of 1970
Classmates for 4 years, friends for life



"Twigs" Reunion—Classmates mostly from the class of 1970. Kneeling L-R: Jim Juopperi, Steve Siedentopf, John DePuydt '71, Joe Asiala, Dennis Wyllie, Dan Kretz. Standing L-R: Jim Hewett, Ron Studer '71, Dick Windnagel, Mike Kerttu, Bob Harsel, Adrian Jentoft, Jeff Jahnke, Lou Best, Lon Labumbard, Joe Minier, Jerry Lukach, and Bob Ball.



SFRES TOURS & BRUNCH AT THE NARA NATURE CENTER



Top left: 1978 Alumni cohort tour SFRES with new dean Andrew Storer. Top right: 1978 alumni cohort at the Nara Nature Center. Bottom left: Storer with Golden M Alumni-1968. Bottom right: Storer with Outstanding Alumni Xiping Wang and Honored 65 year alum, Bob Penberthy.



Michigan Technological University

SCHOOL OF FOREST RESOURCES AND ENVIRONMENTAL SCIENCE

1400 Townsend Drive
Houghton, MI 49931-1295



CHARLES BECKER

Charles Becker '84 '86 is currently the Lake States Area Manager for Weyerhaeuser's Northern Hardwoods region. He oversees approximately 650,000 acres in Michigan and Wisconsin. His extensive efforts and involvement in the forest products field have included council and committee assignments such as the Michigan Timber Advisory Council, Michigan DNR Public Land Management Strategy Advisory Committee, Michigan Office of Regulatory Reinvention Natural Resources Advisory Rules Committee, Michigan

CHARLIE BECKER INDUCTED INTO SCHOOL OF FOREST RESOURCES AND ENVIRONMENTAL SCIENCE'S HONOR ACADEMY

Forest Products Council, and the Michigan Tech School of Forestry and Environmental Science Advisory Board. His ongoing activities include conducting field tours, giving presentations, and providing input to legislators, students, private landowners, and industry professionals in support of the forest products industry in Michigan. In 2013, Becker was honored as the Michigan Society of American Foresters' Forester of the Year. He is an active volunteer serving as trustee and former chair for the Community Foundation of the UP in Delta County. Becker's supervisor at Weyerhaeuser described him "as having that rare combination of technical expertise, genuine personal interest in others, and leadership skills that make him an excellent manager . . . I have always appreciated his integrity

and his unwavering commitment to do the right thing the right way. I can't think of a more deserving person for this award."

As promising students become competent professionals, we get to see them define themselves. Some succeed and become leaders in their fields, in industry, and in their communities. Some have an impact on how the state sees the economic contribution of the forest products industry, and help legislators make better land-use decisions. Charlie Becker has done all these things and has still been generous of his time in helping our students and contributing his advice and leadership to the School's advisory board. He has deservedly earned himself the induction into the Honor Academy for the School of Forest Resources and Environmental Science.

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