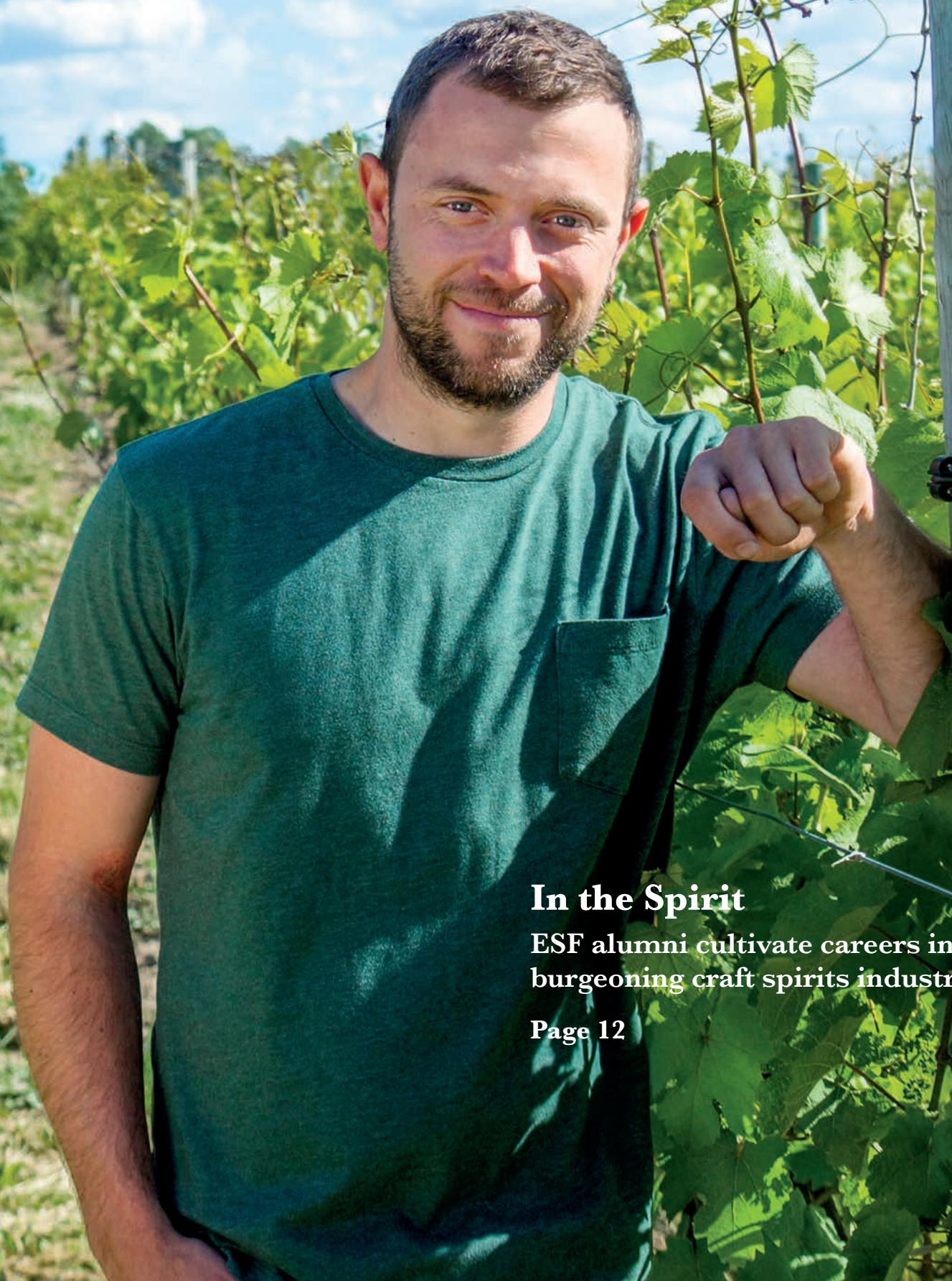


INSIDE ESF



In the Spirit

ESF alumni cultivate careers in
burgeoning craft spirits industry

Page 12

Dog Days of Summer

Rosie the St. Bernard has been an endearing figure on campus over the last year. Rosie is working with her owner, Assistant Dean for Student Affairs Mary Triano, to become a certified Canine Good Citizen (CGC). Part of her socialization involves hanging out in Triano's Bray Hall office and feeling the love of the campus community.

"There's a lot of research that shows dogs have a therapeutic presence on a college campus," Triano said. "A lot of students say they miss their animals from home, and it's nice for them to be able to see a dog and snuggle with one if they want."

Rosie, who is a year old, is training in the "Sit Means Sit" program, and Triano plans to have her tested through the CGC program overseen by the American Kennel Club. Triano is interested in ultimately pursuing therapy dog certification for Rosie, which would allow her to participate in a variety of volunteer activities.





The President's Perspective



ESF and Its Alumni Face The Challenges of Change

I am delighted to invite you to enjoy the latest edition of Inside ESF. Our feature package on ESF alumni working in various aspects of the spirits industry illustrates to me the value in an education. A good education goes beyond preparing a graduate to perform well in that first job. It prepares him or her for success in the last job as well. It establishes the knowledge, skills

and self-confidence to recognize, create and adapt to opportunities.

This is more valuable today than ever. According to the Bureau of Labor Statistics, the average person entering the workforce today will hold 10 different jobs before age 40. To reinvent oneself so many times and to recognize and seize the opportunities in new challenges draws upon personal resources quite different from those honed in narrow training for one job. ESF's rigorous curriculum and world-class faculty teach more than factual content. We challenge students to problem solve, communicate effectively, work in teams, lead, think critically and creatively, see the broader context, meet deadlines and persevere.

Like our alumni, ESF as an institution must constantly face new challenges, see the opportunities in them and adapt to succeed. The world is changing at an unprecedented pace. State governments are not supporting higher education as before. Environmental challenges — fueled by growing demands on natural resources, climate change and an expanding population — are increasingly complex and require collaborations across disciplines. And the value of college education is being questioned at the same time that the debt incurred by college students is skyrocketing.

I am pleased to say that the typical ESF student graduates with a debt burden well below the national average. This is because of efforts by ESF and the State University of New York system to contain both costs and the rate of increases in tuition. Also contributing to our students' relatively low debt load is the generosity of ESF alumni, friends and benefactors who continue to fund or endow scholarships and make gifts to the College that increase its excellence and accessibility. I am deeply appreciative of this generosity and confident that this investment in the next generation will be handsomely repaid.

Quentin Wheeler
ESF President



INSIDE ESF

Summer 2016

Inside ESF is published by the Office of Communications at the SUNY College of Environmental Science and Forestry.

STAFF

Editor

Claire B. Dunn

Art Director

Wendy P. Osborne

Writer

Karen B. Moore

Contributing Writer

Margaret McCormick

Editorial Assistance

Peggy Olrich

Contributing Editors

Mark Murphy

Tom Boll

Correspondence

Office of Communications

122 Bray Hall

315-470-6644

www.esf.edu/communications

InsideESF@esf.edu

Cover

For Justin Paolicelli '07, an ESF degree led to a career among the grapevines. He is one of several ESF alumni cultivating careers in the spirits industry.

Cover photograph by Wendy P. Osborne

Inside ESF is printed on recycled paper.

Contents

FEATURES

12 The Spirits of ESF

Alumni quench thirst for success in wine, beer and distillery industries

DEPARTMENTS

4 Across the Quad

Highlights from the ESF news feed

10 News from the North

Students blaze new trail to honor Dr. Ketchledge

18 Student Success

Graduate student finds orchids blooming on mine tailings

20 Giving

Doctoral student Robert Moesch joins the battle against Zika virus

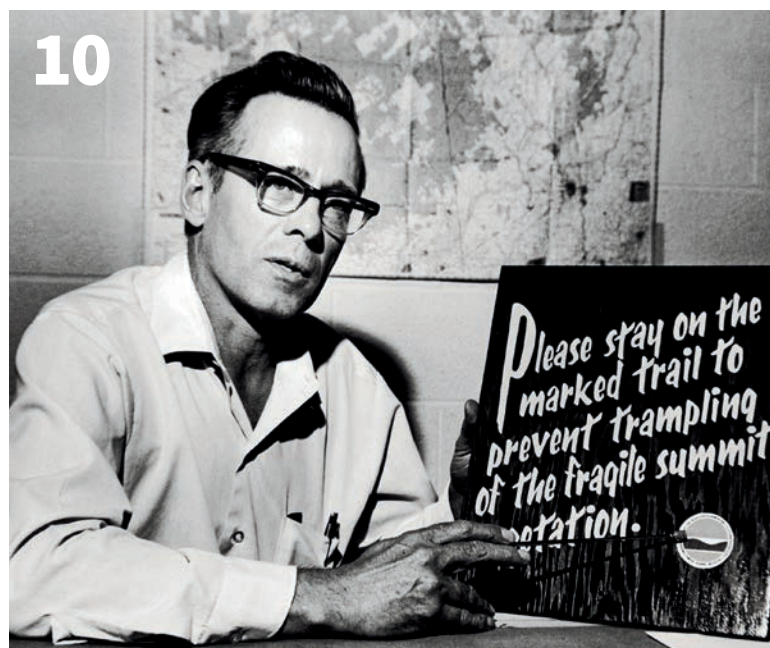
21 Acorn Nation

ESF celebrates its place in SU lacrosse history

ON THE WEB

We invite you to check out the new online Inside ESF at www.inside.esf.edu. You can enjoy:

- more stories and videos about ESF alumni who have careers in the spirits industry including Tyler Harver '11, sustainability supervisor at Matt Brewing Company, and Christina Killourhy M.S. '15, brewer at Flying Bison Brewing Company.
- a gallery of photos from the bioblitz at the Skaneateles Conservation Area
- a story about the 30th anniversary of the Friends of Moon Library
- selected highlights from the Inside ESF archives





ACROSS THE QUAD



ESF Receives STARS Gold Rating For Sustainability Achievements

ESF has earned a STARS Gold Rating in recognition of its sustainability efforts from the Association for the Advancement of Sustainability in Higher Education (AASHE). STARS — the Sustainability Tracking, Assessment & Rating System — measures and encourages sustainability in all aspects of higher education. The Gold Rating is the second highest distinction of STARS, and the score of 73/100 currently places ESF among the top 15 performing colleges and universities nationally and makes the College No. 1 in New York state.

“This is a tremendous accomplishment for ESF and reflects on the efforts of our students, faculty and staff — past and present — to make the College a more sustainable institution,” said ESF President Quentin Wheeler. “Although we are proud of this achievement, our work is not finished. We will continue to develop and implement ways for ESF to be more sustainable. This includes improving our generation and use of renewable energy across the main campus and regional campuses; improving our energy efficiency; addressing transportation, mobility and access issues; implementing additional sustainable practices for materials management and green purchasing; and continuing to ‘green’ campus events.”

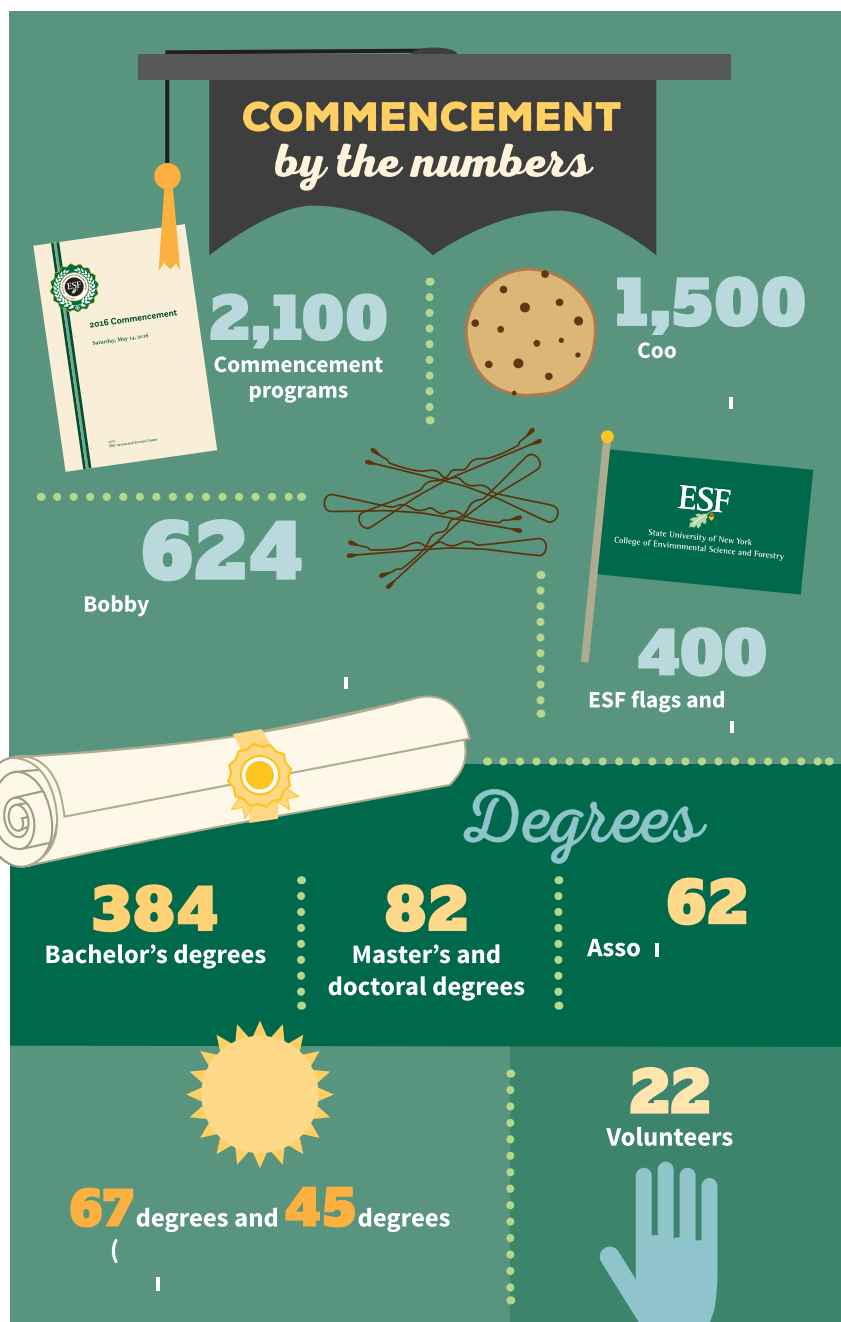
With more than 650 participants on six continents, AASHE STARS is the most widely recognized framework for publicly reporting comprehensive information related to a college or university’s sustainability performance. Participants report progress in four credit categories: Operations, Academics, Engagement, and Planning & Administration.

ESF has been tracking sustainability efforts on campus using STARS since participating in the initial pilot program in 2008 and earned a STARS Silver Rating in 2011. This year, ESF earns high marks in the Academics and Engagement categories. ESF scored all 18 points available in the research section and 36 of 40 for curriculum.

“We know the STARS framework is not all-encompassing,” said Mark Lichtenstein, executive director of sustainability at ESF. “It doesn’t include indicators of financial viability. As sustainability refers to long-term viability with respect to economic, social and environmental constraints, we recognize that a high STARS rating doesn’t mean our work is finished. The strength of STARS is that it is a quantitative framework useful for benchmarking and learning from best practices at other universities.”

In addition to the main categories, several unique practices at ESF were recognized in the Innovation section, garnering credits for the LEED Platinum Gateway Center, the shrub willow sustainable remediation project at the Solvay Settling Basins, the Environmental Scholars Program, and the establishment of a protocol acknowledging the College’s location on the original territory of the Haudenosaunee Confederacy.

The College has established a Sustainability Committee comprising administrators, faculty, staff and students, which continues to identify new ways to build sustainability at ESF. Members of the college community who have ideas about how ESF can make its operations more sustainable are invited to send suggestions in an email to sustainability@esf.edu.



Class speakers Rhea Joseph, left, and Fareya Zubair shared a speech, urging their classmates to stay united and value understanding as they face the future. For a story about ESF Commencement and a gallery of photos, visit www.esf.edu/commencementphotos.



Stephen Stehman

Stehman Honored as Exemplary Researcher

Dr. Stephen Stehman, a professor in ESF's Department of Forest and Natural Resources Management, was named the College's Exemplary Researcher for 2016-17.

Stehman, a SUNY Distinguished Teaching Professor, is "an outstanding researcher who brings a quiet passion to his courses and imparts unsurpassed knowledge of his field of study, statistics, to his students," said ESF President Quentin Wheeler, in announcing the honor.

Stehman is author or co-author of dozens of scholarly works, including a key article in *Science* titled "High-Resolution Global Maps of 21st-Century Forest Cover Change." He has reviewed more than 132 manuscripts in the past several years and ranks among the most highly cited authors at ESF. He has mentored many graduate and undergraduate students and has served on more than 55 master's and doctoral committees.

He serves as associate editor for "Remote Sensing of Environment" and "Remote Sensing Letters." His recent work on the mapping of tropical forest loss, in "Proceedings of the National Academy of Sciences," received national press attention.

Stehman received his Ph.D. in biometry from Cornell University in 1990; his M.S. in statistics from Oregon State University in 1982; and his B.S. in biology from Pennsylvania State University in 1979.

The award, now in its 11th year, recognizes successful, currently active researchers who have an exemplary record of research activity, publications and graduate and undergraduate student mentorship.



Stewart Diemont

Diemont Receives ESF Foundation Award For Teaching

Dr. Stewart Diemont has received the 2016 ESF College Foundation Award for Exceptional Achievement in Teaching.

Diemont is an assistant professor in the ESF Department of Environmental and Forest Biology. The award recognized

his creativity as a teacher and his contributions to the professional engineering community.

Diemont teaches courses in ecosystem restoration, ecological engineering and sustainable engineering.

Diemont earned a bachelor of arts degree in anthropology, pre-medicine, from the University of Texas, Austin; a master's degree in environmental sciences and engineering from the University of North Carolina, Chapel Hill; and a Ph.D. from The Ohio State University, Columbus, Ohio, in the Department of Food, Agricultural and Biological Engineering.

The Foundation Award was established in 1999 to celebrate the accomplishments of ESF faculty members who have achieved excellence in teaching.



The State University
of New York

Five ESF Employees Receive Recognition from SUNY

Five ESF employees were honored by Chancellor Nancy L. Zimpher for their service to the State University of New York.

Raymond Appleby, manager of pilot operations and instructional support specialist in the Department of Paper and Bioprocess Engineering, was honored with the Chancellor's Award for Excellence in Professional Service.

Appleby has held his current position since 2005. His colleagues value his advice and counsel, especially in terms of facilities, equipment, the operations of the pilot plant and the development and implementation of instructional, research and service projects.

Dr. Eddie Bevilacqua of ESF's Department of Forest and Natural Resources Management (FNRM) received the Chancellor's Award for Excellence in Teaching.

Bevilacqua has been a faculty member at ESF since 1998, teaching courses in biometrics, natural resources measurements and geographic information technologies.

Dr. Gregory Boyer of the Department of Chemistry received the Chancellor's Award for Excellence in Faculty Service.

During his tenure at ESF, which began more than 30 years ago, he has served in many capacities, including director of the Great Lakes Research Consortium, secretary and treasurer for the Northeast Algal Society, steering committee member for the National Plan for Marine Biotoxins, member of an EPA taskforce on contaminant monitoring and a member of the national Harmful Algal Bloom Advisory Committee.

Dr. James P. Gibbs of the Department of Environmental and Forest Biology was awarded the Chancellor's Award for Excellence in Scholarship and Creative Activities.

Gibbs has been affiliated with ESF since 1997. He is internationally known for his research in the Galapagos, especially his work on the giant tortoise.

Deborah Sovocool, a secretary in FNRM, received the SUNY Chancellor's Award for Excellence in Classified Service. The award is given to University Classified Service staff who have consistently demonstrated superlative performance within and beyond their position.

Sovocool joined ESF in 1988 as an account clerk and moved to University Police and then the Office of Student Life. She worked as secretary for the Registrar's Office before becoming FNRM secretary in 2010.



Climate Change Redistributes Global Water Resources

Rising temperatures worldwide are changing not only weather systems, but — just as importantly — the distribution of water around the globe, according to a study published this spring in the journal, *Scientific Reports*.

Analysis of more than 40 years of water samples archived at the Hubbard Brook Experimental Forest in New Hampshire tells a vivid tale of how the sources of precipitation have changed. Over the years, there has been a dramatic increase, especially during the winter, of the amount of water that originated far to the north.

“In the later years, we saw more water derived from evaporation of the Arctic and the North Atlantic oceans,” said Tamir Puntsag, an ESF graduate student who was the lead author of the study.

This study marked the first time scientists have used specific measurements to demonstrate how water sources are changing, especially in the northeastern United States. “Climate change has an important relationship to the water cycle. It goes beyond temperature effects,” said Distinguished Professor Myron Mitchell, Puntsag’s co-author and adviser. “This study shows how climate change is altering the spatial patterns and amounts of precipitation — where it comes from and where it falls. Such effects can drastically affect the availability of potable water and also contribute to the massive flooding we have seen in recent years.”

Scientific Reports is an online journal from the publishers of *Nature*. Other researchers involved in the study were John L. Campbell, a former doctoral student of Mitchell’s who is affiliated with the U.S. Forest Service Northern Research Station in Durham, New Hampshire; Eric S. Klein of the University of Alaska Anchorage, Biological Sciences Department; Gene E. Likens of the Cary Institute of Ecosystem Studies in Millbrook, New York; and Jeffrey M. Welker, also of the University of Alaska Anchorage.

As record-warm temperatures in the Arctic cause dramatic decreases in the depth and coverage of sea ice, the Arctic vortex (often called the polar vortex) has become less stable,

occasionally spilling frigid air onto the eastern United States. The altered circulation of moisture in the atmosphere drives changes in the global water cycle, causing, for example, Arctic water to fall as rain or snow in New Hampshire, some 2,500 miles to the south.

Mitchell said the study’s findings will help scientists understand changes that are likely to affect global water resources. With 85 percent of the world’s population living in the driest half of the planet and 783 million people living without access to clean water, according to the U.N., it is vital for scientists and policymakers to understand how a changing climate affects water resources.

“Our research helps our understanding of the sources of rain and snow and how these precipitation patterns have changed. Our study also sheds light on what is going to happen to water resources in the future,” Mitchell said. “This is another clear indication that climate change is happening, and we’re seeing evidence of it today. If we are going to understand how water and temperature interact, it is important to understand how climate change, including alterations in the water cycle, affect us locally, regionally and globally.”

Puntsag used isotopic analysis (identification of the structure of the atoms that make up a substance, such as water) to develop a story of the water’s travels. Water always contains two atoms of hydrogen and one atom of oxygen, but its isotopic composition can vary from one water source to another. She examined samples collected weekly between 1968 and 2010.

This research is part of her doctoral program in water and wetland resource studies. An international student from Mongolia, Puntsag arrived at ESF as a Fulbright Science and Technology scholar, and her work has also been funded by the National Science Foundation. She gathered data through painstaking analyses of archived samples that had been collected weekly as part of the NSF’s Long Term Ecological Research Network. — Claire B. Dunn



Endangered Fish Lend Their Ear (stones) As Researchers Aim To Save Species

Fish species that are both economically and ecologically important in South America live mysterious lives.

Scientists know relatively little about the thousands of fish species living in the world's largest river system — from the primitive, bony-tongued Arapaima that is the largest fish in the Amazon to giant catfishes that undertake some of the longest migrations of any freshwater fishes in the world.

“These species have the potential to disappear if we don’t learn more about them. We know next to nothing about many of them, even though many are being harvested at alarming rates,” said Ted Hermann, an ESF doctoral student in fisheries science. “This is a unique ecosystem, and some of these fishes are enormous animals. And they might be gone in a matter of decades.”

To that end, Hermann and three co-authors published a study in June in the new online journal, Royal Society Open Science, that reports on the use of chemical analysis of ear-stones or “otoliths” as a way to tease out a fish’s life story, potentially revealing its migratory routes and the environments it encountered in its travels. The paper, titled “Unravelling the life history of Amazonian fishes through otolith microchemistry,” describes the identification of chemical markers that can trace a fish back to the Amazon estuary and to “black water” vs. “white water” rivers. Another marker reveals that at least one species, the Amazonian corvina, may not be as sedentary as previously believed, raising new questions about how best to ensure the long-term survival of this economically important fish.

The study is part of an emerging body of knowledge that lays critical groundwork for the conservation and management of these threatened species. The goal is to provide fisheries managers and conservationists with better information about how to protect fishes from threats that include deforestation, mining, oil drilling,

“We’re trying to study their biology as fast as we can — either before their environment is destroyed or before we eat them all up.”

— Ted Hermann

construction of dams for hydroelectric power, and overfishing.

The study is part of Hermann’s doctoral dissertation. His co-authors are Dr. Donald J. Stewart, who is Hermann’s adviser, and Dr. Karin Limburg, both fisheries ecologists at ESF; and Dr. Leandro Castello, who completed his doctoral work at ESF and is now a faculty member at Virginia Tech.

The research focused on the migrations of Amazonian fish species, some of which travel as much as 3,200 km (nearly 2,000 miles) in the Amazon River and cross international boundaries during their lives.

“When commercial fishes migrate among several countries, their conservation and management demand international agreements, and those in turn require knowledge of the fishes’ basic biology,” Stewart said.

Dams also present a challenge. “As more and more hydroelectric dams are being built in the Amazon Basin, this sort of new information can allow us to identify sites where dams would have minimum impact on these fishes and associated fish yields,” said Castello.

Of particular interest to researchers are the stories told by otoliths — ear-stones that contribute to a fish’s ability to hear and balance. Made of calcium carbonate, otoliths grow as the fish grows, forming rings each year that can be read

much the same way as a tree’s rings. Their growth incorporates traces of other elements that reflect the inherent chemistry of the water in which the fish lived. Through X-ray fluorescence and mass spectrometry analysis, scientists can extract from the otoliths the story of the fish’s growth and movements among different environments.

Using analyses of otolith chemistry as a research method presents distinct advantages over other tracking methods, Hermann said. The vastness of the Amazon system, which drains nearly 7 million square kilometers (approximately 4.3 million square miles) means most locations are remote enough to make tagging impractical and expensive for many species. Some species move extensively throughout their lives, making direct tracking difficult. Tagging and tracking devices typically cannot be used on larvae or small juveniles, leaving a fish’s early life unknown; also, costly satellite tags can be lost if a fish is caught by a fisherman.

The best management decisions require knowledge of a fish’s life history from hatching through its larval, juvenile and adult stages in addition to its spawning behavior. For example, otoliths tell the story of whether a fish lived in “black water” (more acidic rivers that resemble tea and have an abundance of decaying plant material) or “white water” (rivers, heavy with sediments, that look like coffee with milk). The Amazon estuary also has its own chemical markers related to the mix of fresh and salt water that indicate a fish spent some of its life in that sprawling, unique ecosystem.

“Fish constitute our last wild food source,” Hermann said. “Everything else we have comes from farms. But that cod fillet from the grocery store was a wild animal. We’re trying to study their biology as fast as we can — either before their environment is destroyed or before we eat them all up.” — Claire B. Dunn

ESF Monitors Waters of Sodus Bay

Buoys Help Predict Toxic Algal Bloom

A crisp, clear spring morning when sunlight sparkles off the water might seem like an odd time to think about toxic algal blooms that coat the water in a thick blue-green film, but it's precisely when researchers start water monitoring.

Toxic blue-green algal blooms in the northeastern United States typically form during the hot days of August. By keeping an eye on the water chemistry throughout the summer, researchers might be able to predict when a bloom might be coming.

Michael Satchwell, senior research support specialist at ESF, and undergraduate Matt Blake deployed three buoys in Sodus Bay in early May to monitor water conditions in the bay. The solar-powered buoys measure the basic water chemistry, including temperature, pH, dissolved oxygen levels, chlorophyll and phycocyanin, which is specific to blue-green algae. The southernmost buoy houses a complete weather station and measures certain nutrients and water levels.

"If we see a spike (in the chemistry) we know there's potential for a bloom to come," said Satchwell. Data from the buoys is transmitted to the Great Lakes Research Consortium's website (www.esf.edu/glrc/buoys/) where anyone can follow the data.

"If we get them (blue-green algal blooms), we get them typically in the late summer," said Ed Leroux, a resident of Sodus Bay who assists the ESF team.

The bay experienced a major bloom in 2010 that shut down businesses two weeks before Labor Day, delivering an economic blow to the popular tourist area. "No one was in the water, no one was in the restaurants," Leroux said.

Blue-green algae blooms, or cyanobacteria, can be harmful to humans and fatal to pets. Exposure to the algae can result in diarrhea, nausea or vomiting; skin, eye or throat irritation; and allergic reactions or breathing difficulties.

Save Our Sodus, a group dedicated to addressing challenges to the quality of Sodus Bay, asked Dr. Greg Boyer of the ESF Department of Chemistry to look

into the matter. Boyer, director of the Great Lakes Research Consortium and member of Save Our Sodus, has studied algal blooms in numerous water bodies in the Northeast and China.

Boyer began random water sampling in the bay in 2011 and has since collected a substantial amount of data. The buoys were also installed in 2011 with funding from a number of sources, including a grant with the U.S. Environmental Protection Agency through the Great Lakes Restoration initiative and funding from the Great Lakes Observing System.

"To date, data shows chlorophyll has dropped off while phosphorus levels vary up and down, and toxicity is down; but that doesn't necessarily mean things are getting better. Phosphorus levels have to be in check, and we have to be able to predict the toxicity levels," said Satchwell.

Blooms are known to form in tight corners and areas with little water circulation, such as marinas, so the town installed blowers — normally used to keep ice from forming — to help keep the water moving in the summer.

So far, researchers have not identified a "smoking gun" that identifies what precisely triggers the toxic blooms.

Fortunately for the merchants and tourists in Sodus Bay, "there hasn't been a significant bloom since 2010," noted Satchwell.

"If you keep studying it, it won't come back," Leroux said, somewhat tongue in cheek. "So we're going to study it to death." —Karen B. Moore

Undergraduate Matt Blake, left, and Michael Satchwell, senior research support specialist, deploy a buoy in Sodus Bay that will assist researchers in their quest to predict blue-green algal blooms.



Scientists Honored for Study on Improving Odds For Bats' Survival



Ben Prom, left, a lab technician with the Roosevelt Wildlife Station, and Jacqueline Frair, associate professor and associate director of the Roosevelt Wildlife Station

Two ESF researchers are part of an innovative team of scientists that has been honored for research focused on improving bats' odds of surviving white-nose syndrome (WNS). The team investigated the bats' migratory patterns, habitat use and ability to fight the disease.

USDA Forest Service Chief Thomas Tidwell presided over the 2016 Wings Across the Americas Conservation Awards ceremony held as part

of the North American Wildlife and Natural Resources Conference in Pittsburgh, and honored outstanding work in the conservation of birds, bats, butterflies and dragonflies.

Tidwell presented the research partnership award to a team, led by the Forest Service, that includes researchers from the service's Northern Research Station and Forest Products Laboratory as well as ESF; state natural resource agencies in Wisconsin, Michigan, New York, Pennsylvania and Vermont, and three national forests. The partnership takes a holistic approach to studying the effects of WNS and aims to find ways to help bats cope with the disease, from studying whether microbes on the bats' wings are helping to build immunity to WNS to identifying where land managers might improve habitat so migrating bats are healthier and more resilient to the disease.

The ESF team members are Dr. Jacqueline Frair, a wildlife ecologist and associate director of the College's Roosevelt Wildlife Station, and lab technician Ben Prom.

"White-nose syndrome is as complicated as it is devastating," said Deahn Donner, principal investigator for the partnership and a project leader/landscape ecologist with the Northern Research Station in Rhinelander, Wisconsin. "It is a problem that has to be attacked from many angles and on many scales."

The study plan for "Multi-scale Landscape Approach for Studying the Secondary Effects of White-nose Syndrome in Bats of the Upper Midwest" was developed by Donner with co-principal investigators Paula Marquardt, a Northern Research Station population geneticist in Rhinelander, and Brian Heeringa, a wildlife biologist specializing in bats who splits his time between the Chequamegon-Nicolet National Forest and the Northern Research Station in Rhinelander.

Wings Across the Americas, sponsored by Forest Service programs, works with a wide range of partners in the United States and overseas to conserve habitats and populations of birds, bats, butterflies and dragonflies.



Chelonoidis donfaustoi, Eastern Santa Cruz Tortoise



Umma gumma



Sirdavidia solannona

Top 10 New Species for 2016

A hominin in the same genus as humans and an ape nicknamed "Laia" that might provide clues to the origin of humans are among the discoveries identified by ESF as the Top 10 New Species for 2016.

The list also includes a new kind of giant Galapagos tortoise, which could serve as a poster species for conservation and evolution, and two fish — a seadragon in stunning shades of ruby red and pink and, conversely, an anglerfish that would not win an undersea beauty pageant. Rounding out this year's Top 10 are three invertebrates — a tiny isopod that builds its own mud shelters, a beetle named after a fictional bear who traveled from Peru to London and a damselfly with a suggestive name; and two plants — a carnivorous sundew that was considered endangered as soon as it was found and a tree that was hiding in plain sight.

Brazil and Gabon each contributed two new additions to the planet's biodiversity. The others hail from Ecuador, South Africa, the Gulf of Mexico, Australia, Spain and Peru.

The list, compiled annually by ESF's International Institute for Species Exploration, is made public around May 23 to recognize the birthday of Carolus Linnaeus, an 18th-century Swedish botanist who is considered the father of modern taxonomy. The list attracts international publicity.

"Knowledge of what species exist, where they live and what they do will help mitigate the biodiversity crisis and archive evidence of the life on our planet that does disappear in the wild," said Dr. Quentin Wheeler, ESF president and founding director of the IISE.

For more information about the Top 10 New Species for 2016, go to www.esf.edu/top10/.



Lost Pond

Students Follow in Famed Prof's Footsteps As They Blaze a New Trail to Lost Pond

By Claire B. Dunn

The creation of a nature trail in the forest near Cranberry Lake has given ESF students from the main campus and The Ranger School a chance to retrace the footsteps of a famed ESF professor and help reinvigorate one of his pet projects.

The work is the construction of a nature trail to — and around — Lost Pond, a scenic pond fringed by a bog and marked by a great blue heron rookery, a beaver lodge and an array of wildflowers, amphibians and songbirds. To a large extent, the trail follows the same route as one walked some 40 years ago by Dr. Edwin H. “Ketch” Ketchledge, who

taught at the College from 1955 to 1985.

Ketchledge was a professor of forest botany and for nine years served as director of ESF's Cranberry Lake Biological Station. He died in 2010.

In the 1970s, Ketchledge created a nature trail that ran from the

state boat launch on Cranberry Lake to Lost Pond, about three-quarters of a mile away. He produced an interpretive booklet that focused on the trees and plants along the trail and the impacts of human settlement in the Cranberry Lake region. For reasons lost to history, the trail fell out of use and eventually was overgrown to the point of disappearing.

Several years ago, discussions about revitalizing the trail and extending it to loop around the pond reached representatives of the Adirondack Park Agency, including two of Ketchledge's former students, Dan Spada '82, M.S. '85, and Ray Curran '71, M.S. '74. Curran had somehow come into possession of an original copy of his mentor's booklet. Spada and Curran took the old guide out to the site to see if it still had value.

“Amazingly enough, we found that a lot of the things he talked about in the field, we could still find. We saw the same plant varieties, the same cliff communities,” Spada said. “Even

subtle successional dynamics were observed. For example, at Stop #1 the beech seedlings Ketch described as covering the forest floor were grown into trees.

“Ed Ketchledge, in his inimitable way, and through his eyes, was describing what we were now seeing 40 years later at that spot. He was an incredible naturalist, so he didn't only see the plant — he talked about the geology and the climate and past forest history. It was the whole deal.”

Curran said Ketchledge had a gift for weaving together the natural world and the evolution of the landscape as affected by human impact. “A big part of it was how he reflected on the landscape. Now, there's the old story as Ketch told it and a new story because the land around the pond has been logged since Ketch was there.”

Eventually, with involvement by the Adirondack Park Agency; the Molpus Woodlands Group, which owns the land; the state Department of Environmental Conservation,

“We had the idea of a short, family-friendly trail that would be easy to get to,” Savage said.



Class of 2016 Ranger School students and Professor Jamie Savage created a new trail to Lost Pond near Cranberry Lake.



Edwin H. Ketchledge

ESF Graduate Is Newcomb's Artist-in-Residence

Sculptor George Bumann, a member of the ESF Class of '98, is the artist-in-residence at the Newcomb Campus this summer.

Bumann, who lives at Yellowstone National Park's northern entrance in Gardiner, Montana, is a lifelong observer of nature and was raised in his mother's sculpture studio. He earned his bachelor's degree in wildlife ecology, went on for a master's degree and has worked in the fields of wildlife research, taxidermy, back-country guiding and environmental consulting. He has taught art and natural history programs for youth, adult and university audiences since 1990.

Bumann and his family are spending a month working out of the Adirondack Interpretive Center in Newcomb. Visitors have several opportunities to interact with him.

"As a wildlife sculptor, George connects closely with Anna Hyatt Huntington's legacy," said Paul Hai, program coordinator for the ESF Northern Forest Institute. "We are developing a partnership with the Hyde Collection in Glens Falls to offer additional content around the residency." Huntington was a

famed sculptor who, with her husband, Archer Huntington, donated 15,000 acres of forest property to the College in 1932. The Newcomb Campus now includes that land.

Bumann's work is in collections throughout the United States and around the globe, including the permanent collections of the National Museum of Wildlife Art in Jackson Hole, Wyoming, and the C.M. Russell Museum in Great Falls, Montana. His work was featured in the book, "Sculpture of the Rockies," by the editors of Southwest Art magazine.

Bumann is an elected member of the National Sculpture Society and the Society of Animal Artists, and his work has been shown at the society's annual exhibitions and miniatures shows as well as at the Coors Art Exhibit & Sale, Bennington Center for the Arts' Art of the Animal Kingdom, the Birds in Art Exhibition at the Leigh Yawkey Woodson Art Museum, the C.M. Russell Museum Auction and the Sculpture in the Park show in Loveland, Colorado. His educational outreach has been featured in numerous publications and on television, radio and the internet.

which manages a public easement on the land; and the towns of Clifton and Fine, the project was adopted by the Five Ponds Partners, an all-volunteer subcommittee of the Clifton-Fine Economic Development Corp. Ranger School Professor Jamie Savage is chair of the partnership, which recently developed a 50-mile trail around Cranberry Lake.

"We had the idea of a short, family-friendly trail that would be easy to get to," Savage said. "The Five Ponds Partners became the official steward of the Lost Pond Nature Trail so we could build and maintain it." Savage, with some volunteer Ranger School students, faculty members and community members, hiked into the woods last fall to begin clearing a path for the trail. "We started cutting out brush and some trees with hand tools, following flagging that DEC officials and I had laid out last year," Savage said. "Then we went back this spring — on National Trails Day — with seven students from the summer forestry program and their teaching assistant, a few recent Ranger School grads who are working in the area and some local residents. We completely cut out the trail, which now goes to the pond, all the way around it and back to the parking lot."

The 2-mile trail starts off Columbian Road, just west of the hamlet of Cranberry Lake. It takes hikers through an upland hardwood forest, along the bottom of a cliff that towers about 60 feet above the trail, and then through the mixed conifer and hardwood forests that ring the pond. The trailhead is close enough to Route 3 to attract local residents and visitors alike, but the pond itself is well buffered from the sights and sounds of the highway.

Savage will head back to the trail again in the fall with willing Ranger School students and fellow Five Ponds Partners to finish trail construction. By next spring, Savage plans to install a self-guided interpretive program along the trail, with assistance from students in his Interpretive Techniques class. "It's important to maintain an ESF connection to this trail," Savage said, "in honor of Dr. Ketchledge and ESF's long-standing ties to this region."

"It's very fulfilling and rewarding to see this happen and to continue Ed Ketchledge's legacy," Curran said. "It's great that this trail has a life of its own."



Sculptor George Bumann is the artist-in-residence at the Newcomb Campus this summer.

The..... **SPIRITS**of **ESF**



A GLASS OF WINE OR A COLD BEER MIGHT MARK THE END OF THE WORKDAY FOR MANY PEOPLE, BUT FOR A GROUP OF ESF ALUMNI, WINE, BEER AND STRONGER SPIRITS ARE AT THE CENTER OF THEIR WORK. THESE GRADUATES ARE USING THEIR ESF EDUCATIONS IN WAYS MANY HAVE NEVER CONSIDERED.





MATTHEW MONTANARO



DISTILLER'S JOB INCLUDES BOTTLING, LABELING, CLEANING AND, YES, TASTE TESTS

By Margaret McCormick

An employee who drinks on the job is usually a liability to a business. But in some cases, an employee who drinks on the job, as part of his job, is an asset.

Consider Matthew Montanaro '14. He's the head distiller at 1911 Spirits, a producer of premium hard cider, vodka and gin made from apples grown in LaFayette, New York. "I get that all the time, the 'drinking on the job' comments," Montanaro said with a smile.

The 1911 Spirits brand is the craft beverage end of Beak & Skiff Apple Orchards, a family business that has grown into a major agritourism destination. Montanaro scored an internship there in late 2013, while he was a bioprocess engineering student at ESF. He cleaned kegs, washed floors and worked on the hard cider bottling line, among other duties.

It was a great learning experience, he said, and a case of being "in the right place at the right time": He got an education in distilling and running a distillery from a seasoned cider maker and distiller who was ready for retirement. Montanaro graduated in May and stepped into the distiller position in December of that year.

"In college, I started home brewing, and from home brewing, I knew I would like that kind of scene," Montanaro recalled. "The more I learned about the industry, the more I knew I wanted to focus on distilling. I got lucky here, to have someone train me and to learn."

Beak & Skiff has been growing apples on the rural hillside south of Syracuse for more than 100 years. It's a seasonal business — the sprawling Apple Hill campus welcomes thousands of visitors each year to pick apples and sample cider and spirits, or both. Montanaro works year-round at the distillery, on the north side of Route 20, where he enjoys "the best view on the campus," overlooking a valley where apples grow as far as the eye can see. He loves the connection to the land and making the connection of "tree to bottle" right outside the door. "It's nice to come here early in the morning and watch the sun rise over the valley," he added.

It's not the career he envisioned when he was a high school student on Long Island or a college student at ESF. He earned a bachelor's degree in bioprocess engineering and imagined he might someday work in the paper industry or in chemical engineering, as many of his former classmates do now.

Montanaro said his education at ESF trained him to work well in a collaborative environment. He gets that at 1911 but often works largely on his own. His job begins with the arrival of fresh-pressed apple cider from the facility across the road. The cider is pumped into fermenters, yeast is added to work its magic and the juice stays there for three to five days. It's then distilled three or four times and cut with purified water to create a smooth vodka with a hint of fruitiness or sweetness. You know it's made from apples, but it doesn't taste like apples, just as other vodkas don't taste like corn or grain.

At several points in the process, he samples for quality control — just the tiniest of tastes. “You know what’s good, and you know what’s not right,” he said. “That’s the art of it.”

The vodka is used to make the 1911 Spirits gin, which is lightly infused with juniper berries and other botanicals to give it a distinct but not overpowering flavor. Both are truly a handmade product: Montanaro bottles four bottles of vodka or gin at a time, then corks the bottles and applies labels by hand.

“It’s not the most complicated process in the world,” he said, “but there’s chemistry at work here. It’s definitely an art as much as it is a science.”

It’s physical work, Montanaro said. It involves constant movement and cleaning of kegs, tanks, gear, surfaces and floors. “A lot of people with a bachelor’s degree or an engineering degree wouldn’t want this job,” he said. “Cleaning is 75 percent of it. It’s a food business. I enjoy being on my feet for most of the day, instead of sitting at a desk.”

He also enjoys working in an industry that’s enjoying a resurgence. The craft beer and hard cider business is booming in New York state, and craft distilling is enjoying what Montanaro called a “major growth phase.” Production at 1911 Spirits has doubled since 2013, he noted. Its vodka and gin are available in restaurants and bars throughout New York state — and even on cruise ships.

“Craft distilling is where craft brewing was 10 years ago,” he said. “The big guys own a huge share of the market, but it’s fun to watch the craft industry grow.”

Margaret McCormick is a writer and editor based in Syracuse.

HER RECIPE FOR SUCCESS: TURN WINE-MAKERS’ WASTE INTO FLOURS WITH TASTE

by Karen B. Moore

Winemaking is an age-old practice, and for as long as people have been producing wine, they’ve produced pomace that has been tossed into the waste pile. Roughly 11,000 tons of grape pomace — seeds and skins — are discarded yearly in New York’s Finger Lakes region after wine is made. Hilary Niver-Johnson ’11, founder and owner of Sustainable Viticulture Systems, transforms these leftovers into something useful: wine flour.

Operating out of a 320-square-foot facility in the town of Hector overlooking Seneca Lake, Niver-Johnson hand-sorts, separates, sun-dries

and stone-mills the pomace into colorful and flavorful flours.

“I hand-sift everything, so it’s very labor-intensive, but it also guarantees quality because I see every grain that goes into every bag,” she said.

Made purely from grape seeds and skins, the flours are used as an additive to traditional flour in recipes, infusing dishes with a complexity of rich flavors and colors. The flours reflect the different flavors of the various grapes and, in the case of red varietals, also lend a purple color to the food.

“Purple pancakes, purple pie crusts, purple pizza crusts: It’s a huge way to sell it to kids,” she said.

The flours also add nutritional benefits to foods thanks to the antioxidants, protein, fiber and minerals naturally found in grapes, she said.

Wine flour is a value-added product from the wine production. Most wineries have to find a way to dispose of the pomace, which can be time-consuming and costly. Niver-Johnson gets her supply from three area wineries after the grapes are pressed.

“I haul it off for them, and they’re happy it’s taken care of,” she said.

At ESF, Niver-Johnson majored in environmental science with a minor in renewable energy. One

of her early research projects, under the direction of Dr. Timothy Volk, involved measuring energy flows in vineyards and wineries to determine energy intensity per bottle. The project drew the attention of the University of Nebraska-Lincoln and Nebraska Renewable Energy Systems, which hired her after graduation to do case studies for wineries in South Dakota, Iowa and Nebraska, where there is a burgeoning wine industry.

It was there that she learned about grape seed oil, but she soon discovered that the oil makes up only a small percentage of the pomace — and a large amount was still being wasted. As she wondered how to use this leftover material, she realized that skin flour was a more economically feasible and useful product.

She returned to New York in 2013 and started developing her own wine flours. SVS began processing in the fall of 2014, with the first products — riesling and cabernet sauvignon flours — launched in June 2015. These were followed by five more varieties by the fall.

Niver-Johnson is the only producer of wine flours on the East Coast. “I’ve got pretty much all the market shares over here,” she said.

Counting her research at ESF, she is in her sixth year of value-added grape research. In the last two years, she’s developed a number of products including a wine flour cupcake line, wine flour



HILARY NIVER-JOHNSON



JUSTIN PAOLICELLI

chocolate truffles and grape skin bran. She is developing crackers with Cornell University but has launched her own cracker line on her website.

"I love trying new things with the wine flours," she said. "You can really make it a vibrant flavor, especially if you use grape seed oil in your recipes along with wine. I try to bake and cook with wine whenever I can. It really brings out the flavor of the grape and the wine in our area, which is really cool."

If flour production weren't enough to have on her plate, Niver-Johnson hopes to add even more value to the humble grape — renewable energy technologies. When a grape seed is pressed for oil, the leftover pellet, a press cake, can be burned in a pellet stove and has Btu similar to woody biomass pellets. "You don't have to alter them in any way," she said. "Just put them in a stove. They'll make your winery, business or home smell like grapes."

She has applied to do a technology incubator program to conduct research on the process, obtain supplies and possibly build a prototype.

"I absolutely love doing research, and ESF only enhanced my love for it. You're constantly doing research projects in every class, which is great. ... ESF played a major role in how I developed this business and fostered my passion for sustainability, recycling and waste management. It was a great experience then and continues to be five years after graduation," she said.



WINEMAKER GETS EVERY LAST OUNCE OUT OF ESF DEGREE

By Karen B. Moore

A weekend job in the tasting room of Three Brothers Wineries and Estates led Justin Paolicelli '07 down an unexpected career path. Today, he's the winemaker at the Seneca Lake business, which features three wineries and a microbrewery on its estate.

Paolicelli graduated from ESF with a focus in plant pathology and physiology. His then-girlfriend/now wife, Erica, was working at Three Brothers Winery to earn money for graduate school. On weekends, Paolicelli helped out in the tasting room. During those shifts, he would talk to owner Dave Mansfield about the vineyards.

"I would point out diseases and what was being done incorrectly and what could be done better and ways to improve the vineyard, and eventually he offered me the job (of vineyard manager)," Paolicelli said.

Paolicelli worked in that capacity for two years, drawing on his ESF education to bring renewed vitality to the 30-plus-year-old vineyard.

"I can remember taking several organic chemistry classes at ESF and not enjoying them much, but they've proved to be very useful."

— Justin Paolicelli

When the winemaker left in 2010, Mansfield offered the job to Paolicelli. Having grown up 20 miles west in Seneca Falls, Paolicelli felt he had the right background for winemaking. "Growing up in the Finger Lakes, you have the palate for wine, and winemaking is 50 percent science and 50 percent art. I felt like I maybe had the art part down." For the other 50 percent, he drew on his organic chemistry classes.

"I can remember taking several organic chemistry classes at ESF and not enjoying them much," he said, "but they've proved to be very useful."

"A lot of people are not as fortunate to be able to get every last dollar out of their degree," Paolicelli said, "but I draw on those experiences continually."

Three Brothers and Paolicelli are intertwined as a vine and a trellis. Instead of going to graduate school, Erica became a partner at Three Brothers. The couple got engaged and married at the winery and bought a house no more than 50 feet off the vineyard property.

Winemaking is a year-round business, and there is no "average day" at Three Brothers, Paolicelli noted. "Depending on the time of year, it's very different."

In the spring, the staff is in at 7 a.m. making wine. "We're either filtering or bench trialing with new blends," he said. Along with the wine, Three Brothers makes ciders using locally sourced apples. "We're constantly fermenting new ciders and turning them out."

Summers are taken up with long days of wine bottling. The winery produces 35,000 cases a year. "That's fairly large for the Finger Lakes, and we bottle just about everything in house," Paolicelli said.

"Fall is extra crazy," he said. The tourist season runs from July 1 through December. "We're probably the most-visited winery on the (Seneca) Wine Trail." A typical weekend can see up to 1,400 people pass through the winery.

"Most of the growing season is dedicated to 'How are the grapes doing?' because you can't make great wine without great grapes," he said. Paolicelli works closely with his vineyard



BRIAN CADAMATRE

manager to ensure the chemistry of the grapes is progressing as it should and the plants are healthy and disease-free. The winery has won numerous national and international awards for its wines.

Harvest starts around Sept. 1. “That’s basically what people refer to as ‘30 Days of Hell,’” he said. “It’s really not hell. It’s a very enjoyable time of year, but it’s very labor-intensive.” Working 50- to 60-hour weeks for a month straight is common. The grapes on the 30-acre farm are handpicked, meaning it takes almost a full month to bring in the approximately 120 tons of grapes.

During the same time period, the fermentation process is occurring. It has to be monitored three to four times daily. “It’s why it was critical for me to live really close where I could nurse these things. You’re smelling them every day, you’re tasting them every day and you’re recording chemistry and changes in chemistry. There’s so

many crucial parts to winemaking that happen right at that time that influence the outcome of the finished product.”

When Paolicelli became Three Brothers’ winemaker, the winery was producing approximately 4,000 cases of wine a year. The output has since increased to more than eight times that amount and 5,000 cases of hard cider have been added. The staff also makes root beer, orange cream soda and ginger beer; craft beer will soon join the mix.

Not one to stand still, Paolicelli intends to learn the beer-making trade as well.

The year Paolicelli graduated, Billy Joel was the commencement speaker in the joint commencement ceremony with Syracuse University. “His last line was, ‘Love what you do and do what you love,’ and I’ve always remembered that. Many mornings I wake up and think, ‘Jeez, I love what I do.’”

PLANTING THE SEEDS FOR A FINGER LAKES WINERY

by Karen B. Moore

For Brian Cadamatre ’05, M.P.S. ’06, owning a winery was a goal before he came to ESF. “It was one of those grand ideas you have when you’re young and think, ‘How hard can it be?’ Fifteen years later, it’s like, ‘Oh, it’s that hard,’” he said, standing in the field that will one day be home to Trestle 31 Winery in the Finger Lakes.

Cadamatre graduated from ESF with a bachelor’s degree in forestry and a master’s degree in natural resources management. After graduation, he and his wife, Nova, moved to Fresno, California, where Nova had a job as a winemaker waiting. Cadamatre had a harder time finding a job in the forestry industry. When the couple moved to Napa, he, too, entered the wine industry. “I ended up with Treasury Wine Estates in Napa doing supply-chain work, which was my first real introduction to the wine industry outside of my wife.”

The natural resources education paid off. “It’s just taking all the critical thinking and analytical side of things, exclusive of what the subject is, and applying that to a different product,” he said.

After building their careers in California, the couple saw their stars align on their dream of building their own winery. At about the same time that they put in an offer on the Seneca Lake property with the intention of holding it until they were ready to move forward, Nova was offered a job at the Canandaigua Wine Co. in Canandaigua, New York, about 25 miles west of the winery site.

The Cadamatres want to keep some income flowing and self-finance the venture as much as possible, so they haven’t quit their day jobs as they launch their winemaking operation.

Cadamatre still works as the finance manager of Constellation Brands, the biggest wine company in the world, and Nova is the director of winemaking at Canandaigua Wine. “We’re willing to take as much time as needed,” he said. “We want to limit exposure in terms of debt. Especially in an industry like wine that is capital-intensive and you don’t necessarily see revenues that fast.”

The Cadamatre property sits on 12 acres on the northern end of Seneca Lake, six of which will be planted in vines, three of riesling and three of pinot noir, by 2018. “I think we can do an awesome pinot here. It’s just that it’s such a fickle grape. We plan to keep the area as natural as possible,” he said.

Until the vineyard goes in, the Cadamatres are sourcing their grapes from a neighboring vineyard. “It’s right next door,” he said, “so in terms of environmental factors that influence flavor, it’s close to what Trestle 31 will produce. We’re trying to mimic as much as possible as to what might be here.”

They are working with a fellow vintner who is producing wine for them under Nova’s guidance. They expect their first offering to be available this fall.

Cadamatre has an architect working on plans for the winery and a tasting room that will be nestled in the back of the property. “I’d like the building sooner rather than later so we can have a tasting room and establish our position here with a road frontage sign that says who we are,” he said. Cadamatre estimates a 2021 target date for a complete winery and vineyard.

Until they have a building, sales will be online and through self-distribution to restaurants and bottle shops.

Karen B. Moore is a writer in the ESF Office of Communications. She grew up in the Finger Lakes Wine Country.

AS HOPS SPECIALIST, ESF GRAD FIELDS CALLS FROM ALL OVER

By Claire B. Dunn

New Yorkers who are thinking about growing a small plot of hops on their property often call Steve Miller EFB '74 for advice. People thinking about launching a 50-acre hops-growing operation also call him, reaching him in his Morrisville, New York, office from as far away as Ohio or Michigan.

Hops growers from all over the northern and eastern United States have learned from Miller, as have growers in Europe. They ask about planting practices, pest management and harvesting equipment. Brewers call to ask how they can find local sources for their ingredients.

Miller answers their questions. He also checks the progress of hops plants growing in four greenhouses in North Syracuse and consults with Dr. William Smith at ESF about increasing rot resistance in the 22-foot wooden poles that form the framework for hops yards. He traveled to Poland to check out machinery — dryers, balers and tillage equipment — that might be useful in Central New York, and he works with a local manufacturer that is looking to produce a mobile hops picker.

He also teaches growers about integrated pest management, puts out a newsletter for growers, runs educational workshops, speaks at conferences, communicates with both the state Department of Environmental Conservation and loggers about tree species most suitable for use as poles in hop yards, and is a co-author of the Cornell Integrated Hops Production Guide.

"I'm the only one doing it at this level," said Miller, the first person to hold the position of hops specialist with Cornell Cooperative Extension of Madison County. "My job is different every day. People call me from all over the Northeast. I've had people call me from Uruguay, wanting to put in a hop yard. I've been interviewed by German newspapers and by CNN. There's a lot of interest in growing hops."

Miller fields the requests from an office just down the road from SUNY Morrisville. He took on the hops responsibilities for Cornell Cooperative Extension about five years ago, after working for Cornell's Geneva Experiment Station doing plant pathology research and then with the cooperative extension office in Oneida County, where he conducted programs on commercial horticulture. Now his attention is focused on hops, the flowers that grow on bines (plants that climb by growing shoots around a support structure, as opposed to vines that grow using tendrils and suckers) and give beer its distinctive taste.

"In the last 15 years, the craft breweries have really taken off, and that's opened up a lot of



STEVE MILLER

opportunities for these small hops growers," he said.

The increasing number of craft breweries in New York, and the related interest in hops, offer an opportunity for a lesson in the state's agricultural heritage. In the mid-19th century, Central New York was a leader in hops production; 21 million pounds of dry hops were produced annually on 40,000 acres at the industry's peak, around 1880.

That changed in the early 20th century, when a disastrous fungus hit the plants, followed by Prohibition. When Prohibition ended in 1933, the hops industry resurfaced on a large scale in the Pacific Northwest.

Now, fueled by support from the state's creation in 2012 of a farm brewery license that encourages craft brewers to use products grown in New York state, the growing of hops is enjoying a modest resurgence in New York. To hold the farm brewery license, a brewery must buy 20 percent of its ingredients from New York growers. The amount will increase to 60 percent in 2019 and 90 percent in 2024.

When Miller began working as hops specialist, he said, there were 15 acres of hop yards in Central New York. Now there are more than 350 acres, at an investment of about \$20,000 per acre. The state's craft beer industry grew 59 percent from 2013 to 2014, according to a report prepared by Stonebridge Research Group and released by Gov. Andrew Cuomo. Miller said the nation's craft breweries will create enough demand in the next five years to support an additional 12,000 acres of hop yards.

Hops grow on bines supported by a trellis 18 feet tall. They provide beer with aroma and flavor and contain anti-microbial and antifungal properties that help preserve beer.

"You're producing chemistry to flavor things," Miller said. "There is a lot of chemistry to brewing. Anybody can make alcohol. It's making beer that someone wants to buy that's a challenge."

Tending the state's hops operation grew out of Miller's interest in plants, which led him to enroll at ESF at the height of the environmental movement in the early 1970s. He followed that with a master's degree from Clemson University, where he studied pomology and entomology. He said his environmental education gave him a unique perspective on the use of pesticides and gave him knowledge that enhances his conversations with the DEC, loggers and Smith.

"The science education I got at ESF was probably the most valuable thing," he said. "I definitely approach my work from an environmental perspective. You get a really good education at ESF, and there is a lot you can do with it."

Claire B. Dunn is editor of Inside ESF.

Inside on the story

Visit www.inside.esf.edu for more stories and videos about ESF alumni in the spirits industry.

Got Questions About Wood Utilization?

When Steve Miller calls Dr. William Smith for information about rot resistance in the wooden poles that form the framework of hop yards, he taps into ESF's oldest public service and demonstration initiative. Smith directs the ESF Wood Utilization Service, established in 1913 to help encourage the most efficient processing, manufacture, marketing and use of wood. Services include consulting, testing, demonstrations and use of ESF's unique wood processing and testing facilities. To learn more about the Wood Utilization Service, go to www.esf.edu/wus/.



Margaret Foley, left, and Fareya Zubair

Two ESF Students Earn SUNY Chancellor's Award

Margaret Foley and Fareya Zubair, who graduated from ESF in May, were honored this spring with the SUNY Chancellor's Award for Student Excellence.

The award is the highest honor bestowed upon students by the State University of New York.

Foley, an environmental and forest biology major from Fredonia, New York, has been a member of the Undergraduate Student Association since her first year at ESF and served as president her senior year. She was a resident assistant, an undergraduate teaching assistant and a participant in the ESF Honors Program. She also served as student representative on the ESF College Foundation Board of Directors and the ESF Alumni Association Board of Directors, and as a member of the SUNY Student Assembly.

Zubair, a biotechnology major from Manlius, New York, was a research assistant on ESF's American Chestnut Research and Restoration Project. She was a teaching assistant and tutored students at a community college. In addition, she was a member of the Undergraduate Student Association, most recently as director of student affairs and diversity. Zubair is a founding member of "Unearthed," ESF's environmental literary journal.



Sustainable energy management major Samantha Moore Guillaume developed a project to reduce food waste and help those in need. She collected unopened packaged food that had been served to students at Enders Road Elementary School in Manlius and delivered it to Fayetteville-Manlius Community Outreach, which serves people in need of food, clothing and services. Her work is part of an internship program with the Sustainable Materials Management Stewards program.



Students James Mills, left, and Jake Brillo, and Dr. Whitney Lash Marshall check out the contents of a net during the bioblitz at the Skaneateles Conservation Area.

36 Cold, Windy Hours = 256 Species Conservation biology students tally life forms for management plan

A group of ESF students dispersed across 345 acres of forested hills and wetlands in April, cataloging every species they could find to help plan the future of the Skaneateles Conservation Area (SCA).

The final tally: 153 plants, 36 birds, 19 invertebrates, 18 fungi, 15 herpetofauna, nine mammals, six fish species and one extensive management plan.

Students in Dr. Whitney Lash Marshall's Senior Synthesis in Conservation Biology took on the project as a way to distill all their ESF classes into one hands-on experience. The 65 students in the class split up the responsibilities, with some doing the planning and preparation, some doing the inventory and others preparing the report.

"The idea behind the senior synthesis is for the students to take everything they've learned at ESF and apply it to a real-world place, thinking about conservation issues while they do it," Marshall said.

The class produced an 11-chapter management plan for the conservation area, which is about 15 miles west of Syracuse. It includes streams, ponds, wetlands and upland forest, and is popular with hikers, hunters, fishermen and dog walkers.

"The partnership of ESF with the town of Skaneateles on the bioblitz was a successful start at cataloging the diverse life forms at the conservation area," said Randy Nonemacher, chairman of the Skaneateles Conservation Area Advisory Committee. "My hope is that these events can demonstrate to the citizens and leaders of the town what an important asset the SCA is, not

only as a place to fish, hunt and walk dogs, but as a place to observe and protect a bit of our natural heritage. A management plan is an important tool for any group trying to maintain and improve an area as large and diverse as the SCA."

The bioblitz took place on a cold, windy weekend in late April. Between 30 and 40 students, joined by some citizen-scientists, spent 36 hours cataloguing every species they could find.

Marshall said the search turned up some interesting migratory bird species, including eastern meadowlark, brown thrasher and osprey. The students also identified five salamander species: yellow spotted, northern two-lined, dusky, spring and eastern red-backed.

"We found more salamanders than we had thought we might, and that's a good thing. It's a good indicator of stream health," Marshall said.

Dr. James Gibbs found a snapping turtle, much to the delight of the students who watched him clamoring through the wetlands, and several spotted salamander egg sacs.

Nonemacher said one significant outcome of the project is that four ESF students began working as interns, mapping and removing invasive plants at the SCA. They have also helped out at nearby Baltimore Woods and are doing outreach work this summer and into the fall.

"My hope is that continued support by ESF can help us document the problems so that the town will be motivated to act to protect and restore the area," he said.

For a gallery of photos, go to www.inside.esf.edu.



Grete Bader in a field of orchids.

Get a Lode of This: Orchids Are Thriving at Former Iron Mine

Millions of native orchids are flourishing on the site of a former iron mine in the Adirondacks, suggesting that former industrial sites — typically regarded as blighted landscapes — have untapped value in ecological restoration efforts.

ESF graduate student Grete Bader, who completed her master's thesis on the site, said the plants are growing on a wetland that developed naturally on iron mine "tailings," the waste left over from the process of separating the valuable part of an ore from the rock that has no economic value. She said that in addition to six types of native orchids, some of which have populations estimated at a million, the location supports New York state's largest population of pink shinleaf, also called pink wintergreen, which is listed by New York as a threatened plant. The plant is rare in New York except at this location.

"The fact that this site restored itself from bare mine tailings to a diverse wetland plant community over the past 60 years is incredible, and the populations of orchids and pink shinleaf notably enhance its conservation value," Bader said.

The wetland of about 100 acres developed at a site that holds the aftermath of iron ore extraction at Benson Mines in the northwestern Adirondacks. The Benson Mines operations were most intense from about 1941 until the facility closed in 1978. During its heyday, it was one of the most productive iron mines in the country and the largest open-pit magnetite mine in the world, producing about a million metric tons of iron annually during peak operations.

Bader's major professor, Dr. Donald Leopold, a Distinguished Teaching Professor at ESF, said the number of orchids at the site — with colorful names such as grass pink, rose pogonia and hooded ladies' tresses — is "extraordinary."

"It's unlike anything I've seen in more than 40 years of research, often in orchid-rich habitats throughout the United States," Leopold said.

"Until Grete did her research I had thought that there were hundreds of thousands of individuals of these orchid species here, but Grete's more careful assessment suggests that there are actually a million or more of some species."

While people typically think of tropical species when they hear the word "orchid," there are about 60 distinct species of terrestrial orchids native to New York state. All of them are protected by state law because of their beauty; many are also quite rare. With their three-petal flowers and colors ranging from delicate yellow to rich purple, they are widely sought after by nature enthusiasts.

Bader's study suggests that several factors contribute to the number of thriving unique plant species at the site, including a range of soil and water pH, and a variety of mycorrhizal fungi that have a symbiotic relationship with plants. In general, mycorrhizal fungi colonize a plant's root system and increase the host's ability to absorb water and nutrients. In turn, the fungi benefit from the effects of the plant's photosynthesis.



Orchids and pink wintergreen are among the species that depend on mycorrhizal fungi for germination and establishment. The mycorrhizal relationship is unique in these plants because, as seedlings, they essentially act as parasites on their fungi.

Dr. Thomas Horton, an associate professor at ESF and an expert on mycorrhizal symbioses, said the site's industrial past might actually have contributed to the thriving wildflower scene.

"All the orchids and the wintergreen are dependent on mycorrhizal fungi for seed germination. Without the fungi, there would be no plants. Yet after the deposit of the mine tailings, the below-ground system had to develop from scratch, and now we see that all the elements have returned for incredible floral displays. Indeed, it could be that the plants and fungi are so abundant because of the disturbance history, and I feel this adds a wonderful element to the site's conservation value."

Orchids have a unique biology. Their flowers are highly adapted to specific insect pollinators, in some cases deceiving the pollinators into doing their job without a nectar reward. And they are among the most noted examples of the reliance of plants on mycorrhizal fungi — for, in this case, the fungi are needed for seeds to germinate and seedlings to survive.

In addition to the extraordinary number of orchids, the site has an extensive cranberry mat and acres of lowbush blueberries. The site is also culturally significant because the mines were economically important to the region in the mid-1900s.

A grass pink on the site of a former mine

SRC Fellowship Supports Ph.D. Student in Battle Against Mosquitoes as Disease Carriers

A chemical compound — new to science and never before identified — is being investigated by an ESF doctoral student who is working to replicate it so it can be tested as a weapon in the battle against disease-transmitting mosquitoes.

Robert Moesch, who is one year into his doctoral studies in organic chemistry of natural products, said his work is focused on confirming the compound's structure and synthesizing it.

"We talked about this compound before Zika was front-page news," he said, referring to the headline-grabbing virus that has been linked to birth defects. "There are a lot of other diseases transmitted by mosquitoes — the West Nile virus, dengue fever, yellow fever and malaria — that kill millions of people every year."

His work is funded by the SRC Graduate Student Fellowship, which supports ESF graduate students pursuing advanced degrees in technical areas of major national and societal significance. It is one of more than 180 named scholarships administered by the ESF College Foundation, Inc., which provided nearly \$1.5 million in scholarships to ESF students in 2015-16.

Brenda Greenfield, executive director of the ESF College Foundation and ESF assistant vice president of development, said the foundation has a long tradition of working with alumni, friends and organizations to provide financial support for ESF students and academic programs. "One of the most important things we provide funding for is scholarships. Scholarship funding allows the best and brightest students to access an ESF education. With that strong educational background, our students go on to do great things in our world."



Robert Moesch in Jahn Laboratory.

Moesch's adviser, Dr. Francis Webster of the ESF Department of Chemistry, said the research project is unique to ESF. Webster got involved because of his long collaboration with an entomologist, Dr. Colby Schal of North Carolina State University who had identified a chemical compound found in bodies of water — ranging from ponds to puddles to small pools that accumulate in manmade items — that were apparently attractive to female mosquitoes.

"The female mosquitoes lay their eggs in some puddles and avoid others," Webster said.

Webster's contribution was to determine the compound's chemical structure, which he did through the use of ESF's nuclear magnetic resonance spectrometer. For proprietary reasons, Webster does not discuss the name of the compound or its structure. He does, however, say it is probably derived from oak leaves, which are typically found in the water the mosquitoes choose for their eggs.

Moesch is working this summer to confirm the compound's structure and produce a synthetic version that Schal can test.

"If we find it attracts females to certain bodies of water, we would create our own sources of water and put larvacides in it. The larvacides generally are not harmful to the environment but, obviously, they are quite harmful to larvae," Webster said. "And that would greatly reduce the number of mosquitoes. It's basic science, but it's practical as well."

Moesch graduated from ESF with his bachelor's degree in 2011 and worked four years as a synthetic organic chemist with Alpha Scent, Inc., before returning to ESF as a graduate student.

"The fellowship is a huge help because I don't have much other support, besides my work as a teaching assistant," he said. "It helps me to pay my rent and buy food and do all those other things I need to do to stay alive."

ESF was a natural fit when he decided to continue his education.

"There are a lot of selling points for ESF. I like the very specific academic focus in the chemistry department. And I really liked the social aspect of being able to participate in all the activities at Syracuse University." — Claire B. Dunn

For information about giving to ESF, go to www.esf.edu/development.

Feinstone Environmental Awards Honor Women in Science

Four accomplished female scientists will be honored this fall as recipients of the 2016 Feinstone Environmental Awards.

Recipients will receive the awards during the annual Feinstone Environmental Awards Banquet, Oct. 26 in the Gateway Center on the ESF campus.

The "Women in Science" event will honor:

Nancy Barbour, private industry: Nancy Barbour is vice president of Drug Product Science & Technology at Bristol-Myers Squibb Co. She is responsible for global product and process development for the entire pipeline of small molecules, biological compounds and devices.

Janine Benyus, non-governmental organizations: Janine Benyus is known worldwide for her influence in naming the practice of biomimicry and for her work in shaping the practice as an innovation tool that can solve some of humanity's most pressing challenges. She is the co-founder of Biomimicry 3.8 and The Biomimicry Institute.

Robin Kimmerer, academia: Robin Kimmerer, a Distinguished Teaching Professor at ESF, is the founding director of the ESF Center for Native Peoples and the Environment. Kimmerer is a widely respected author of both scientific papers and works of nonfiction that focus on nature.

Anahita Williamson, government: Anahita Williamson directs the U.S. Environmental Protection Agency (EPA) Region 2's Division of Environmental Science and Assessment, overseeing the

collection, analysis and evaluation of environmental data in support of EPA monitoring programs. Dr. Williamson has a strong background and extensive experience in the field of environmental engineering.

The Feinstone Environmental Awards recognize outstanding achievement in advancing the cause of the environment and social environmental issues. The Feinstone Awards were established in 1976 by Sol Feinstone, a 1915 graduate of ESF who was a widely known historian and author.

Those interested in sponsoring the dinner can obtain information by calling the ESF College Foundation office at 315-470-6683 or by sending an email to foundation@esf.edu. Information about ticket purchases will be available this fall.



In 1916, Professor Laurie Cox, who led the Landscape Architecture Department at the College, put together a lacrosse team that consisted mostly of students from ESF, then called the College of Forestry. At right is Tom Nelson '89, the last ESF student to play on the Syracuse University lacrosse team.

SU Lacrosse Turns 100 — But ESF Deserves Points for Starting it

Before lacrosse became a cornerstone of Syracuse University's athletic program, the sport was brought to SU by students from the small state college across the street.

As SU celebrates 100 years of lacrosse this year, it should be noted that the lacrosse tradition began in 1916 when Laurie Cox, head of the Landscape Architecture Department, put together a team consisting mostly of a small group of students from what was then called the College of Forestry.

Two Forestry seniors, Orville Spicer and Howard Yaw, served as manager and captain respectively, according to the SU College Archives. By 1923 the team was strong enough to travel to England and win the World Lacrosse Championship, according to "Forestry College: Essays on the Growth and Development of New York State's College of Forestry 1911-1961."

In an article in the 1919 Empire Forester, it was reported that "the twelve made a splendid showing in its first season's exhibition; and this spectacular and fascinating game became so popular that next year it was adopted by the Athletic Governing Board as a minor sport in the University. ... We predict a brilliant future for Lacrosse at Syracuse."

Cox, a member of the Lacrosse Hall of Fame, felt the sport was a "gentleman's game" that could rise to a prominent spot in collegiate sports.

ESF students played on the Syracuse University lacrosse team until the NCAA ruled that Division I intercollegiate rosters could not include students enrolled at another institution. So despite the close ties between the University and the College, ESF students could no longer play on Division I teams after the late 1980s. Tom Nelson LA '89 was the last ESF student to play lacrosse with the SU team.



Soccer

The ESF women's soccer team played in the semifinal round of the U.S. Collegiate Athletic Association National Championships (USCAA) in November. The Mighty Oaks, whose season ended in a loss in that game, had a 12-2-1 record for the season. Four members of the team were named USCAA All-Americans. The men's soccer team finished its season with a 6-7-1 overall record and 5-2 in Hudson Valley Intercollegiate Athletic Conference play (HVIAC). Two members of the team were named USCAA All-Americans.

Cross country

The ESF men's and women's cross-country teams won championship titles in the HVIAC after just their first year in the conference. Both teams qualified to participate in the USCAA National Championships in November, with the men's team finishing second and the women's team third. Freshman runner Marissa Lathrop was named a USCAA All-American and finished in the top 10 in all but one race during the season.

Golf

The Mighty Oaks men's golf team improved on its performance at every competition. Highlights include several individual achievements, including a third-place finish at the National Collegiate Club Golf Association Invitational by senior Brian Walsh. The team finished in 13th place overall at the famed Penn State University Blue Course during the USCAA National Championships. Senior Alex Brown finished first for the Mighty Oaks and 20th overall with a combined score of 160 (79, 81).

Basketball

The men's basketball team had its most successful season in school history, qualifying for a postseason conference tournament for the first time. The team finished with an 8-13 overall record and 4-3 in HVIAC play. Junior Ryan Caldwell received a USCAA All-American honorable mention.

Track and field

The men's and women's track and field teams competed in several competitions throughout the winter and spring, with several ESF athletes setting school records and finishing in the top 10 in their respective events. At the USCAA National Invitational in April, sophomore Shannon Gordinier picked up a first-place finish in the 100-meter dash with a time of 13.05.

Woodsmen

The women's team that competes as part of the ESF Woodsmen in traditional timber sports competitions finished first at both the Finger Lakes Community College Meet and the ESF Annual Meet. The women's and men's squads finished in third and fourth place respectively at the 70th Annual Northeast Woodsmen's Conclave at Alfred State in April.

Bass fishing

The ESF bass fishing team captured a fifth-place finish in June in the Fishing League Worldwide College Fishing Northern Conference event on the Potomac River in Marbury, Maryland. With more than 50 schools competing, the ESF team turned in one of its best performances.

Get ESF sports schedules and updates
at www.esfathletics.com




State University of New York
College of Environmental Science and Forestry


Office of Communications
1 Forestry Drive
Syracuse, New York 13210-2778

IT OR .
ID
IT N .

CHANGE SERVICE REQUESTED



ESF







invites you to celebrate the
2016 Feinstone Environmental Awards
celebrating

WOMEN *in* SCIENCE

Honorees: Janine Benyus, The Biomimicry Institute;
Nancy Barbour, Bristol-Myers Squibb;
Robin Kimmerer, ESF Center for Native Peoples and the Environment;
and Anahita Williamson, U.S. Environmental Protection Agency (EPA)

Wednesday, October 26, 2016
Gateway Center at SUNY-ESF
6 pm cocktails · 7:30 pm dinner

Tickets and sponsorship opportunities: www.esf.edu/feinstone
Direct questions to foundation@esf.edu or (315) 470-6683



Lead Sponsor— 