

# Bio:Life

COLLEGE OF **Arts and Sciences**  
**BGSU**  
 BOWLING GREEN STATE UNIVERSITY

## DEPARTMENT OF BIOLOGICAL SCIENCES ALUMNI NEWSLETTER

[bgsu.edu/biology](http://bgsu.edu/biology)

### Chair's message

#### Hello Alumni and Friends,

It has been a great start to the academic year! We have over 225 new students in the biological sciences cohort and we have developed a new specialization in pre-health biology to help guide our increasing number of pre-professionals. With over 80 Ph.D. and M.S. students our Life Sciences building is bustling with students taking courses and participating in research. We welcome two new faculty, Tim Davis and Louise Stevenson, to support our research strength in environmental microbiology



and toxicology. Tim is the director of our new BGSU Lake Erie Center for Fresh Waters and Human Health, and Louise is our new toxicologist providing great opportunities for students to be trained in environmental impacts of toxic substances. A downside – Lee Meserve has retired! An upside – he still is engaged with students and he comes in every day! Send Lee a note and tell him about your life experiences since you left BGSU.

If you are inclined to give to our scholarship funds, visit the giving website ([bgsu.edu/give](http://bgsu.edu/give)), enter 'biology' in the fund options toggle and you can choose from an array of scholarships for our students. If you are a former graduate student,

please think about supporting research activities of current graduate students through the Rex Lowe Biology Research Fund. Thank you all.

Also, please become a recruiter for BGSU by talking with your neighbors, your employees, and your relatives about your career and how it started here. We count on you to help recruit the next generation of scientists, health professionals, science teachers, and science-engaged citizens who can also claim that they received their start here at BGSU. We hope your lives are rich and that you find a little time to enjoyably reflect on your career that started here at BGSU.

**Jeff Miner**  
**Professor and Department Chair**

## BGSU to lead Lake Erie Center for Fresh Waters and Human Health

Bowling Green State University has been tapped to lead national research into understanding and preventing toxic algal blooms that plague portions of the Great Lakes and impact freshwater sources around the world.

The BGSU Lake Erie Center for Fresh Waters and Human Health, founded with a \$5.2 million federal grant, will energize and expand research on harmful algal blooms that pose a threat to the health of humans and wildlife. In 2014, toxins from an algal bloom contaminated Toledo's water supply and highlighted the urgency to study this problem.

BGSU is one of four universities the National Institute of Environmental Health Sciences (NIEHS) and the National Science Foundation (NSF) are funding with a total of \$30 million in grants to study the effects of harmful algal blooms on our oceans, estuaries and the Great Lakes.

The Lake Erie Center, a collaborative effort among BGSU and nine other universities and research institutions, will help formalize and strengthen research partnerships on cyanobacterial harmful algal blooms (cHABs). It is the only project focused on fresh water. The other NIEHS/NSF projects focus on oceans and estuaries.



From left to right, BGSU President Rodney Rogers; Mike Ogawa, vice president for research and economic engagement; Sue Houston, vice president for partnerships and chief of staff; George Bullerjahn, professor of research excellence in biology; Timothy Davis, associate professor of biological sciences; and Jeffrey Miner, chair of the department of biological sciences.

Continued on next page

## BGSU TO LEAD LAKE ERIE CENTER FOR FRESH WATERS AND HUMAN HEALTH CONTINUED

“As a public university we have an obligation to serve the public good,” said BGSU President Rodney Rogers. “We do that through research that works to address the real-world issues threatening Ohio, the country and the world. This grant from the NSF and NIEHS is a strong show of support for — and recognition of — the quality and importance of our research into harmful algal blooms.”

Dr. George Bullerjahn, BGSU professor of research excellence in biology, will head the new center as the director and principal investigator for the five-year grant.

“The grant provides BGSU the resources to be a national leader and builds upon our prior collaborations,” Bullerjahn said. “The center greatly expands our scientific capacity. As a result, we can address threats to water quality not only in Ohio, but in large lakes around the world. Center participants have collaborators in China and Africa, regions that are routinely plagued with similar harmful algal blooms.”

Along with BGSU, partners include the National Oceanic and Atmospheric Administration, Ohio Sea Grant, The Ohio State University, SUNY – College of Environmental Science and Forestry, the University of Michigan, the University of North Carolina, the University of Tennessee, the University of Toledo and Michigan State University.

Researchers at the center will focus on how environmental factors promote or constrain cHAB species, what factors influence toxin production, and how other microbes influence cHAB growth and toxicity.

“As a consequence of the award, we expect that we can better predict the onset and toxigenicity of harmful algal bloom events as well as inform lake managers on how to mitigate bloom events,” Bullerjahn said. “Through outreach activities, a better informed and engaged public can make better decisions regarding their use of water resources.”

The Lake Erie Center for Fresh Waters and Human Health will have the staff, facilities and funding necessary to gather vital new data and develop important new research tools to better predict, detect and mitigate cHABs in Lake Erie and beyond.

Read more at [www.bgsu.edu/news/2018/10/bgsu-to-lead-national-research-effort-to-protect-freshwater-lake.html](http://www.bgsu.edu/news/2018/10/bgsu-to-lead-national-research-effort-to-protect-freshwater-lake.html)



*Tim Davis*

## Tim Davis shares expertise with EPA, State of New York

Dr. Timothy Davis, an associate professor of biology, was appointed to the EPA's Board of Scientific Counselors, a federal advisory committee that provides advice, information and recommendations to EPA's Office of Research and Development on its research programs. He also participated in harmful algal bloom (HAB) summits in New York that were part of Gov. Andrew Cuomo's large-scale initiative to combat cyanobacterial HABs in upstate New York lakes.

As part of this three-year term with the EPA's Board of Scientific Counselors (BOSC), Davis will serve as a member of the Safe and Sustainable Water Resources (SSWR) subcommittee and, based on his expertise, will provide advice and recommendations on such topics as science and engineering programs, plans, laboratories and research management practices.

Davis participated in Cuomo's summits in Syracuse and Ticonderoga. The \$65 million, four-point initiative focuses on 12 priority lakes vulnerable to harmful algal blooms (HABs) that are critical sources of drinking water and vital to tourism. He shared his research of studying HABS events in Lake Erie and other large lakes around the globe.

Davis joined the BGSU Department of Biological Sciences in August 2017. He has spent the last 11 years studying the ecology of harmful algal blooms. During the course of his research, Davis looked at understanding the environmental drivers of HABs in several lakes throughout the Northeast, including Lake Erie and Lake Champlain. He also studied the ecology of the toxic HABs that occur in drinking water reservoirs that serve the greater Brisbane, Australia, which has a population of 2.3 million people.

# BGSU contributions inform decision to designate Lake Erie impaired



*BGSU researchers look at Lake Erie water quality*

In 2018, Ohio's Environmental Protection Agency and Gov. John Kasich designated the western basin of Lake Erie – from Toledo to Marblehead – as an impaired waterway due to toxic algae. This designation comes after consultation with experts from Bowling Green State University, among other organizations.

"This is a great first step, a recognition of the fact that these blooms are impairing Lake Erie," said Dr. Timothy Davis, BGSU associate professor of biological sciences. "This is clearly the right decision."

Davis and Drs. George Bullerjahn, Professor of Research Excellence, and Michael McKay, Ryan Endowed Professor, all in the Department of Biological Sciences, were part of the team that developed the criteria used to declare the open waters of the western basin of Lake Erie impaired. This included determining what metrics should be used and how they should be used.

"We've known for a while that these blooms have been a major issue to the region, and this is really a formal acknowledgment of that issue," Davis said. "It gives us a benchmark to work toward to delist it."



"It's going to take significant nutrient reduction from the watershed to remove the impairment designation," Davis said. "In conjunction with Annex 4, which recommends a 40 percent phosphorus reduction, we will now have great targets to aim for to reduce the impact harmful algal blooms are having in the western basin of Lake Erie."

The team advising the Ohio EPA also included scientists from the National Oceanic and Atmospheric Administration, Ohio State University's Sea Grant College Program, the University of Toledo and the U.S. EPA in making this determination.

Lake Erie — its water, inhabitants and surrounding habitat — has long been the topic of research by BGSU biology faculty. Bullerjahn, Davis and McKay all have a deep history of expertise in and support of Lake Erie water quality research and support.

Davis has spent the last 11 years studying the ecology of harmful algal blooms (HABs). During the course of his research, Davis looked at understanding the environmental drivers of HABs in several lakes throughout the Northeast, including Lake Erie and Lake Champlain.

Internationally known experts in harmful algal blooms and other aspects of water quality, Bullerjahn and McKay are involved in multiple projects centered on the lake. Their research into dead zones in Lake Erie's central basin, with Dr. Paul Morris, has been supported by the U.S. Department of Energy's Joint Genome Institute. The information they have gained from that study complements their Ohio Sea Grant and National Science Foundation-funded studies of nitrogen cycling in the Great Lakes. They have taken a particular interest in the winter environment of the lake, work that has been supported by the National Science Foundation, with additional in-kind contributions from the U.S. Coast Guard and Environment Canada.

Read more at [www.bgsu.edu/news/2018/03/bgsu-contributions-inform-decision-to-designate-lake-erie-impaired.html?cid=em:zoom:032618](http://www.bgsu.edu/news/2018/03/bgsu-contributions-inform-decision-to-designate-lake-erie-impaired.html?cid=em:zoom:032618)

*Davis and Bullerjahn test water for toxic algae*

## Faculty partner with Kenyan colleagues to share knowledge of harmful algal blooms

The bright green water in the bay was all too familiar to the visiting scientists from Bowling Green State University. It indicated a harmful algal bloom (HAB). But, instead of Ohio's Lake Erie or Sandusky Bay, this bloom was in Kisumu Bay in Kenya's Lake Victoria. As scientists have discovered, toxic algae know no national or geographic boundaries and can cause problems wherever conditions are favorable.

Aboard the Kenya Marine and Fisheries Research Institute (KMFRI) research vessel in April were BGSU biologists Drs. George Bullerjahn, Timothy Davis, Michael McKay and Jeffrey Miner, along with Dr. Kefa Otiso, an urban geographer in BGSU's School of Earth, Environment and Society who is originally from Kenya and previously conducted urban environmental research in Lake

Victoria's catchment basin. Working alongside researchers from KMFRI and nearby Kisii University, Bullerjahn, Davis, and McKay collected water samples from the lake and some of its feeder rivers while Miner caught a number of fish including the invasive Nile perch for further study.

The BGSU researchers were in Kenya for a special joint symposium on water quality at Kisii University in southwest Kenya, a collaboration facilitated by Otiso. Titled "Bridging the Gap: Current State of the Science and Future Research Opportunities between the North American and African Great Lakes," the symposium allowed researchers from BGSU, Kisii University, Egerton University and KMFRI to discuss harmful algal blooms and the challenges facing sustainable tourism development around Lake Victoria.

Kisii Vice Chancellor John Akama, whose scholarly interests are in sustainable and cultural tourism, also participated.

"All five of us presented our work at the symposium, along with colleagues from Kisii and KMFRI," McKay said.

In addition, Bullerjahn, Davis and McKay led a half-day workshop for Kisii students at KMFRI's aquaculture center near Kisii town, teaching them techniques for measuring water quality parameters. Bullerjahn had brought biochemical kits to detect different toxins.

Read more at [www.bgsu.edu/content/bgsu/en/news/2018/06/faculty-partner-with-kenyan-colleagues.html?cid=245598592](http://www.bgsu.edu/content/bgsu/en/news/2018/06/faculty-partner-with-kenyan-colleagues.html?cid=245598592)

## HARVARD PROFESSOR PRESENTED 2018 PASAKARNIS-BUCHANAN LECTURES



Dr. Hopi Hoekstra

Dr. Hopi Hoekstra, the Alexander Agassiz Professor of Zoology at Harvard University, presented the Jean Pasakarnis-Buchanan Biological Sciences Lecture Series April 3-4.

For the public lecture, Hoekstra discussed "Digging for Genes That Affect Behavior." Her research interests include the genetic basis of adaptation from morphology to behavior in vertebrates, primarily wild mice. Understanding which genes affect important behaviors and how they work in the brain remains a challenge in biology. She focused on the innate behavior of burrowing, which produces an intriguing and complex animal architecture to explore the genetics and neurobiology of behavioral evolution. She reflected on how studying natural variation in mice can shed light onto the genetics of human behavior.

The lecture for students and faculty focused on "How the Mouse Got Its Stripes." During the afternoon presentation, she talked about how color patterns are among the most conspicuous traits found in nature and which can impact fitness of organisms in the wild. Little is known about the mechanisms underlying their formation and subsequent evolution, especially in mammals. Using the African striped mouse (*Rhabdomys pumilio*), she had developed a model to study how their eponymous dorsal stripes form and evolve. The results reveal a previously unappreciated gene and mechanism for modulating spatial variation in pigmentation, and provide new insight into the ways in which phenotypic novelty evolves across species.

# Biology team provides new insight into beetle-fungus symbiosis

A Bowling Green State University microbiology team played an important role in a scientific discovery about alcohol benefitting fungus farming in beetles.

Dr. Vipaporn Phuntumart, an associate professor in biological sciences, and doctoral students Gayathri Beligala and Satyaki Ghosh contributed to the paper “Symbiont selection via alcohol benefits fungus farming by ambrosia beetles,” which was published in the Proceedings of the National Academy of Sciences.

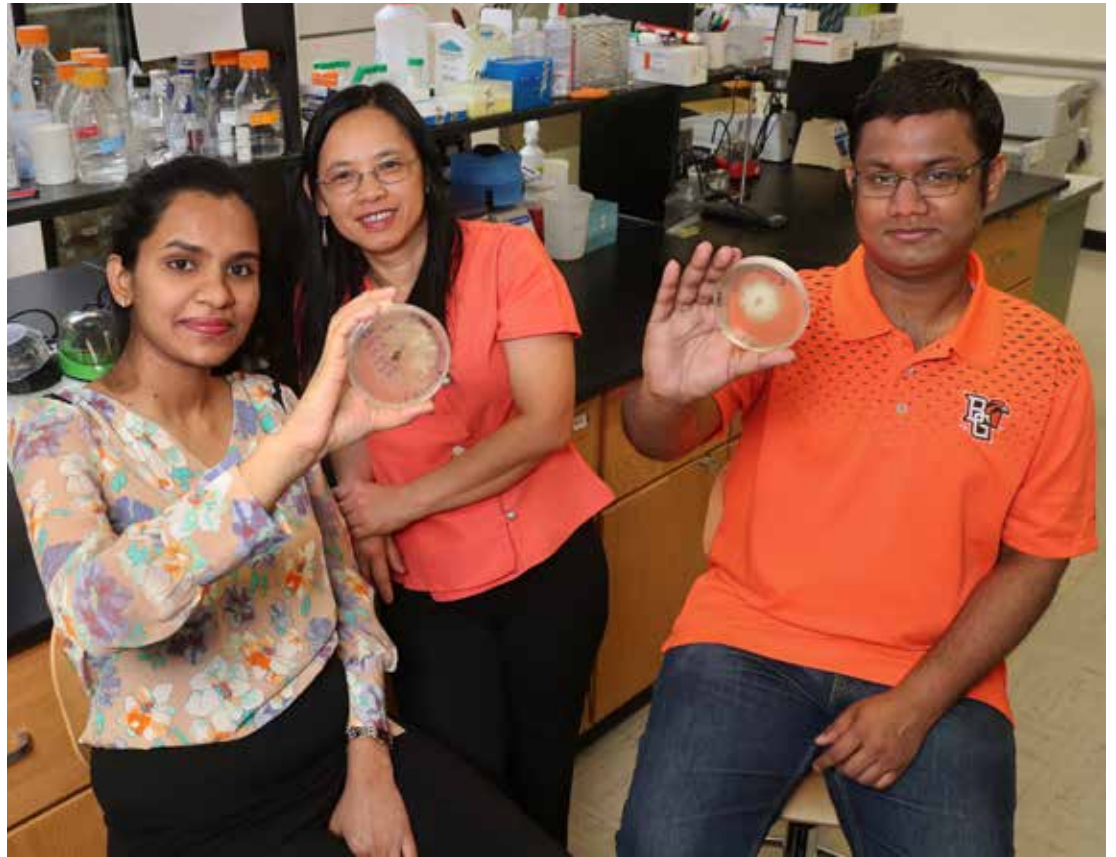
The beetle research, headed by an entomologist Christopher Ranger of USDA-ARS, discovered that alcohol, specifically ethanol, is important for the beetles’ food production, and part of the logic for their attraction to alcohol. Drawn to the smell of alcohol, the beetles can be found, not only floating in beer glasses in a beer garden, but also in weakened trees such as dogwoods and redbuds that produce alcohol.

Additionally, these beetles are “true fungus farmers that propagate, cultivate and sustainably harvest their fungal gardens,” the paper states. In this symbiosis, the beetles farm the fungus as a food source for the larvae, while the fungus uses the beetle as a mean of dispersal and survival. The beetles are host to the fungi and the fungi provide a food supply for the larvae and the adult beetles.

Phuntumart, Beligala and Ghosh helped determine that the presence of alcohol in the weakened trees promotes the growth of fungus.

The BGSU team’s contribution initiated from a scientific discussion on Ranger’s research presentation at BGSU about ambrosia beetles’ attraction to alcohol. Ghosh asked if they had considered if the alcohol also benefited the fungus. As it turned out, there was no evidence that that research had been done.

“That is what happens when people from different fields talk, with different expertise; people see things differently,” Phuntumart said. “Before that time, the entomologists who had been doing this work for a decade didn’t think about the connection between the alcohol and the fungi.”



*Vipa Phuntumart (center) in the lab with graduate student researchers (left and right) Gayathri Beligala and Satyaki Ghosh*

Because she and her team had the expertise and technique to do the research, they were asked to collaborate and to run that part of the experiment.

The paper concludes that the ethanol benefits the fungus and this fungus is established by the beetles when they tunnel inside the trees. Then the fungus that is established inside the tree tunnels is used as a food source by the newly laid larvae.

Read more at [www.bgsu.edu/news/2018/05/a-new-insight-into-the-beetle-fungus-symbiosis.html?cid=243578546](http://www.bgsu.edu/news/2018/05/a-new-insight-into-the-beetle-fungus-symbiosis.html?cid=243578546)

## University House is learning lab for Restoration Ecology



*Dr. Helen Michaels (left) leads restoration ecology initiative*

The grounds of University House, the official residence of the Bowling Green State University president, is a learning lab for students in Dr. Helen Michaels' Restoration Ecology class. Students can observe and identify native and non-native plant species, encouraging the native varieties while destroying the non-native and "woody invasive" ones. The hands-on and laboratory experiences and field trips of the course complement the theoretical and conceptual background they learn in class.

As part of the laboratory experience Michaels and her students collect seeds of plants such as the fragrant mountain mint, big bluestem grass, pearly everlasting and wild bergamot, or bee balm, for replanting in the spring, when the prairie will be blooming with color. "These hands-on experiences are what give the students the skills they need to actually get a job, and it's clearly

helping," Michaels said. "And the students seem to love it."

Student Katie Wallroff said the experiences have "given me a chance to explore nature in a new way."

The experiences in the course include observing controlled burns, a specialized land management technique, and instruction on how to obtain official certification, also known as the "red card."

Land management skills include deciding which technique to use, when and if to plant, and soil analysis. Students learn about not only the individual plants but how they function in a plant community.

Each student must perform 10 hours of service, mostly independently organized by them. In addition to the University House restoration and extensive work with the Nature Conservancy in

Oak Openings and other of its sites, students also do invasive species removal plus forest vegetation analysis for wetland delineation at the University's Steidtmann Woods. Other activities include campus prairie restorations, seed collecting and herbiciding at Poe Prairie. They also perform similar work for the Wood County Park District, Toledo Metroparks and Ohio Natural Areas and Preserves Association.

"The service-learning also allows them to interact with agency people and helps them define their career path," Michaels said.

Read more at [www.bgsu.edu/news/2017/12/restoration-ecology-students-gain-skills-through-service-learnin.html](http://www.bgsu.edu/news/2017/12/restoration-ecology-students-gain-skills-through-service-learnin.html)

## Dan Pavuk, undergraduate researchers have a hand in important mosquito research



*Dan Pavuk*

BGSU insect biologist Dr. Dan Pavuk was on the cutting edge of West Nile virus research again in 2018. The virus claimed its first Ohio victim of the season in July. He and his team of three undergraduate researchers had a part in the research in conjunction with the Ohio Department of Health.

West Nile virus cases are “hard to predict,” Pavuk said. “It’s a very complicated situation with the mosquitoes, where humans are and how mosquitoes, bird reservoir hosts, and humans interact with each other. There’s a correlation, but there are a lot of epidemiological factors that come into play. People over the age of 50 are the most susceptible.”

Pavuk and the three students submitted more than 10,000 mosquitoes to the Ohio Department of Health, and at least 22 batches of mosquitoes tested positive for West Nile virus. That total

exceeded Wood County’s number of positive cases in 2017.

“Many counties around northwest Ohio probably also have many more mosquitoes carrying West Nile virus, but they just don’t have the funds to trap as much as we do in Wood County,” he said. BGSU’s work is funded by the Ohio Environmental Protection Agency through the Ohio Department of Health and the Wood County Health District.

Typically, August through early October is when most human cases of West Nile virus occur.

Last year in Wood County, West Nile virus didn’t show up in mosquitoes “probably until mid to late August,” Pavuk said. “This summer, we had positive tests in the third week of June at one location,” and positive tests increased steadily in Wood County and the state.

More than 300 species of birds harbor West Nile virus, including robins, house wrens, house finches, crows and blue jays, he said.

“The virus builds up in the bird populations and then the mosquitoes get infected more and more as the summer progresses,” Pavuk said.

Read more at [www.bgsu.edu/news/2018/08/optick-in-west-nile-virus-infections-expected-this-mosquito-seas.html](http://www.bgsu.edu/news/2018/08/optick-in-west-nile-virus-infections-expected-this-mosquito-seas.html)

## Students see interaction of biology, geology on Ecuador trip

Traveling by plane, boat, van, on foot and even underwater, a group of Bowling Green State University students and faculty explored the geological and biological wonders of Ecuador's equatorial Andes and Galápagos Islands this past summer. From cloud forest to desert to ocean, they traced the natural and human impact on the environment and followed in the footsteps of Charles Darwin through this most fascinating part of the world.

They experienced hummingbirds alighting on their hands and stood aside to make way for a giant Galápagos tortoise lumbering down a path. They saw sea turtles and schools of sharks swimming beneath them as they snorkeled, watched a blue-footed booby fend off a Galápagos hawk trying to attack her chick, and climbed on rocky slopes formed by volcanoes.

The diverse group of students and faculty brought equally diverse perspectives to the experience. Led by Dr. Juan Bouzat, a professor of biology, and Dr. Jeffrey Snyder, an associate professor of geology and director of the School of Earth, Environment and Society, the eight students represented a wide range of majors including biology, geology, psychology, economics, travel and tourism and pre-engineering.

With their yellow field note books always in hand and often with magnifying glasses around

their necks, the students observed and learned about their surroundings as they moved from one distinctive biome of the country to the next.

"We looked at biodiversity, volcanology, island formation and evolution. It's the perfect place for an integrative learning experience," said Bouzat, who organized the trip. A specialist in evolutionary and conservation genetics, he has written on Darwin's theories and studied South America's Magellanic and Galápagos penguins and other bird species.

Although Darwin is most widely known for his theory of evolution and the origin of species, "he made many important contributions to the science of geology from his observations on the famed Beagle voyage," Snyder said. Combining the two disciplines of biology and geology in the education abroad experience provided students a deeper understanding of how biology is influenced by the environment.

"It definitely broadened my horizon on how the geology is interacting with the biology," said geology major Paul Dress, a sophomore from Port Clinton who went for the opportunity to see firsthand Ecuador's various types of volcanic rock and its many active volcanos.

"There's not really anything like that here in the United States," he said. But his up-close encounters with the animal and marine life proved almost equally amazing, as when he came face to face

first with an octopus and then a large eel while snorkeling, and learned that the blue-footed booby gains its signature foot hue from elements in its diet.

"The whole idea of the survival of the fittest — the Galápagos is where it all happened," said Isaac Rogers, a junior from Bowling Green. "Being in the place that caused Darwin to have that thought was incredible."

Beyond the specific facts the group learned, "realizing that science is fluid and we don't have all the answers, grasping that ideas are ever-changing, gave me a way better understanding of science and how, as Socrates said, if you keep asking questions you will keep expanding your knowledge," said Rogers, an Honors student whose academic major is behavioral economics.

Two of the students' trips were supported by Geotrac Charitable Foundation, which was founded by BGSU alumnus Daniel White of Norwalk. Geotrac's mission is "to expand the worldview of our community by bringing the world to Norwalk and sending Norwalk to the world."

In addition to all the scientific knowledge gained by the students, they also benefited from an expanded world view.

Read more at [www.bgsu.edu/news/2018/09/in-the-footsteps-of-darwin.html](http://www.bgsu.edu/news/2018/09/in-the-footsteps-of-darwin.html)



*Students make way for tortoise to pass*



*Geological wonder provides backdrop for lesson*



# Researchers hope to turn dredge into agricultural resource

Northwest Ohio is on the clock. By mid-year 2020, a long-held practice on Lake Erie will come to an end.

Each year, eight Ohio harbors along the Lake Erie coast are dredged to keep shipping channels open, with 25 percent coming from Toledo Harbor, according to the Ohio EPA. The dredged material is dumped in the open waters of Lake Erie, which has been standard practice for some time. That practice, thanks to Ohio Senate Bill 1, passed in 2015, will come to an end on July 1, 2020.

Three researchers from Bowling Green State University and another from Wright State University have been tasked to come up with an agricultural solution to how to use the displaced dredge.

BGSU's Drs. Shannon Pelini, associate professor, and Louise Stevenson, assistant professor, both in the Department of Biological Sciences, and Angélica Vázquez-Ortega, assistant professor in the School of Earth, Environment and Society (SEES), and Wright State University's Dr. Megan Rúa, assistant professor in the Department of Biological Sciences, are teaming up on two Ohio EPA grants to study the effects of dredge on crops. Each grant is worth \$50,000 and funded through the Lake Erie Protection Fund. A fourth collaborator from BGSU is Dr. Anita Simic, an assistant professor in SEES, who has drones and is an expert on remote sensing.

The researchers want to determine if dredge offers any benefits in terms of nutrients such as cost savings on fertilizer and good soil health. Also, they want to ascertain if dredge introduces additional contaminants into food chains and the environments compared to native soils. Other goals include identifying the appropriate native topsoil to dredged material ratio to achieve the best corn crop yield; determining the benefits of amended soils with dredged material on corn crop yield; identifying the correct fertilizer (phosphate) addition



Working together are (from left) Shannon Pelini, Angélica Vázquez-Ortega and Louise Stevenson

to corn crops, if any, when farms' soils are amended with dredged material; determining nutrient, metal and organic contaminants' (such as PCBs or PAHs) release into soil solution when using dredged material; profiling impacts on abundance, identity and functioning in soil fauna such as bacteria, fungi and invertebrates; and determining metal and organic contaminant bioaccumulation in crops and invertebrates in farm soils amended with dredged material.

"We're combining the grants to work together because we all have different expertise," Stevenson said. "The strategies of the two grants complement each other really well."

Read more at [www.bgsu.edu/news/2018/10/bgsu-researchers-hope-to-turn-dredge-into-useful-resource/](http://www.bgsu.edu/news/2018/10/bgsu-researchers-hope-to-turn-dredge-into-useful-resource/)

## BIOLOGY GRADUATE NAMED TO BGSU'S '10 UNDER 10'

Congratulations to BGSU Biology Alumnus Christopher Winslow, who was one of the "10 under 10" alumni to be recognized at BGSU's homecoming this fall. Winslow, who is director of the Ohio Sea Grant, earned a master's and Ph.D. in biology from BGSU. In his role as director, Winslow has spearheaded efforts to understand, educate and disseminate research on harmful algal blooms and secured \$11 million in grant funding for various causes pertaining to Lake Erie research, teaching and outreach. He holds

membership and leadership roles on a number of committees and boards, including serving as co-director of the Lake Erie Millennium Network. Winslow briefly served as an instructor and advisor for marine and aquatic science majors at BGSU after earning his doctoral degree.



## Ph.D. student brings science, communication skills to Knauss marine policy fellowship

In January, Bowling Green State University Ph.D. student Audrey Maran, her husband, their cat and two dogs will decamp for Silver Spring, Maryland, where she will serve for a year as a communication specialist in the National Sea Grant office, a division of the National Oceanic and Atmospheric Administration.

Maran, who is finishing her doctorate in biology, was chosen for the John A. Knauss Marine Policy Fellowship, one of the most competitive marine policy fellowships in the United States. She is only the second BGSU student to ever receive the award, and the first in many years.

She will be part of the fellowship's executive branch; there is also a legislative branch, whose fellows work primarily on Capitol Hill with lawmakers. The 66 finalists represented 30 of the 33 National Sea Grant programs. Since 1979, Sea Grant has provided one-year Knauss fellowships for more than 1,200 early career professionals to work in federal government offices around Washington, D.C.

"This is one of the most prestigious awards that a junior scientist in environmental sciences can be awarded," said Dr. Shannon Pelini, Maran's thesis adviser and an associate professor of biological sciences.

"It's meant for people with a science background, but it gives you a window into how policy works and how science is turned into policy and how policy affects science on the ground. The idea is it's science to policy," Maran said. "I have very little background in policy but I'm very interested in it because I firmly believe we need science-based policy in our government, and I want to see if I can play a role in helping make our policy more science-based."

Brooke Carney, communications lead for Sea Grant and leader of the NOAA Facilitation Network, will be Maran's mentor at Sea Grant and will work with her to help her reach her goals. For example, Maran said, "I'm really interested in evaluation of the effectiveness of science communication. I'm excited about exploring that."

Sea Grant is a federal-university partnership program, with a network of university-based researchers and outreach specialists located within the coastal communities they serve. The communication specialists' job is to communicate effectively with a variety of audiences, from the public to the legislative, about issues and research and their application to both policy and everyday life.

In her new position, which begins Feb. 2, Maran will have a diverse array of assignments on a wide range of subject matter. As part of her information gathering and disseminating, she may be called upon to interview Sea Grant researchers. She will use her science background to explain complex material and messages through stories and visual aids, from video to infographics to social media. She will also be talking with the people doing the field work about how their applications of science are helping the community, as well as sharing information with them.

"Sometimes we'll get requests from congressmen asking for information and background on topics. In this position, I will do a little bit of that," she said.

According to Sea Grant, "the 2019 fellowship will include specific projects on communicating research impacts as well as a focus on communicating aquaculture research and collaborating with aquaculture operations in other NOAA offices."

Maran said she was initially doubtful about whether her background, which is both in aquaculture and terrestrial systems, would be attractive to the Knauss program since it is specifically aimed at marine science. But that may have turned out to be a plus, along with her education background.

"My first Ph.D. project was at the aquatic/terrestrial interface, looking at nutrient runoff from farm fields, and bugs' role in that," she said. "We hope to improve the number of insects in fields and their role in nutrient cycling. I've always been interested in both aquatics and terrestrial systems, so for me this fellowship felt like a good move."

Not only did the Knauss selection team want her, at the end the intensive "matchmaking" placement week in Washington with 65 agencies, she found herself in the top slots for a number of them, and had to make a decision about which to accept.

"It was a hard choice, and I sat with it for a second, but Sea Grant felt right. I loved the people, the atmosphere, and I love Sea Grant," Maran said, adding humorously, "I asked myself, 'What would Shannon say?' She'd tell me to go for this. I used my inner Shannon voice."



Audrey Maran conducts field work for her research



It was a series of transformative educational experiences that led Maran to where she is today. She vividly remembers a field trip to Stone Lab on Gibraltar Island, an Ohio Sea Grant station now led by Dr. Christopher Winslow, a BGSU graduate.

“When I was in elementary school I was part of a program called Horizons,” she said. “We went to Stone Lab, and I have never forgotten that trip because I loved it so much. I remember dissecting a fish shortly after it was killed so we could still see its beating heart, and we looked at zooplankton in the water. During graduate school, we went again as part of my limnology class and did a lot of the same things. It’s cool that now I can look back at that and think, ‘Oh, now I work for the national group of Sea Grant!’”

Maran attended Start High School in Toledo, and then went to Owens Community College for two years before transferring to BGSU with the goal of becoming a science teacher. She studied life sciences and earth science, receiving her bachelor’s degree in science education, “which is why these communication positions appeal to me so much,” she said.

“When I was an undergraduate, Jeff Miner (chair of the biology department) asked me to work in his lab, which gave me so much more confidence, because I was pretty low in that,” she said. “That’s why I’m so passionate about science communication, especially in public schools, because they do the best they can but the funding isn’t great so you don’t always get a whole lot of that. And that (working in the Miner lab) is what led me to go back to grad school and follow a research path.”

Fondly remembering her own formative experiences in public schools, Maran is dedicated to providing more opportunities to students today. While she was outreach chair for the Biology Graduate Association (of which she is now president), she started a “STEMpals” letter-writing program for elementary school students in nearby Pemberville, a rural district. She reached out to BGSU faculty and graduate students in all the STEM disciplines and got 26 participants, who each wrote four letters to their student STEMpal, and “the kids came here,” Maran said. “It was really cool.” Before she leaves for her fellowship,

she made sure to find a successor to ensure the program will continue. Kristi Weighman, a student in Dr. Paul Moore’s lab, will take over the project.

Between receiving her bachelor’s degree and enrolling in graduate school, Maran worked in two aquatics labs, Miner’s lab again at BGSU and Dr. Christine Mayer’s at the University of Toledo, another inspiring faculty member.

“Someone in Jeff’s lab knew I was into insects and asked if I had met Shannon, who had just come to BGSU and who also worked with insects. I did my master’s with her, so I stayed on and did my Ph.D. In fact, I was her first grad student.”

Today, Maran is working on her Ph.D. on the impact of habitat structure on arthropods who are predators, and detritivores, who consume dead plant materials, and how habitat structure impacts their activities. She’s considering the type of plants present and how dense they are, how much room the arthropods have to move around in, and other factors. She is interested in urban ecosystems, specifically, urban prairies, and whether what’s in them or their location matters more for insect predation.

## DEPARTMENT NEWS

### NEW FACULTY



**Louise Stevenson, Ph.D.**, joined the biological sciences faculty in August 2018. She is an environmental toxicologist focused on predicting the impacts of contaminants on freshwater ecosystems.

Most data on the impacts of any stressor, such as a contaminant, are collected at the individual level: a fish is exposed to increasing concentrations of a chemical and she and her team record its response to this stress. However, they are interested in quantifying the stressor's impacts on whole populations or ecosystems. For example, resource-consumer or predator-prey interactions complicate the extrapolation from individual-level effects to those at the population-level. Her goal is to understand the impact of a contaminant on an individual organism's bioenergetics (how the organism uses energy to grow, reproduce, and survive) and then use this information to predict impacts of contaminants on entire populations.

She uses empirical and theoretical tools: in the lab, she and her team expose an individual organism, such as *Daphnia* (filter-feeding zooplankton), to a chemical and follow impacts on survival, growth, and reproduction. These data are used to create a model of the individual

organism's bioenergetics which demonstrate the chemical's impact. With this model in hand, they predict the impacts of this contaminant on a population using tools such as individual-based models, stage-structured models, or matrix population models.

She is also interested in using suborganismal data (e.g. changes in gene expression) to predict impacts on individuals by connecting this molecular data directly to a model of an individual's bioenergetic response to a contaminant. The goal of her work is to use data that are easy to collect in a lab to predict responses that aren't, such as using suborganismal or organismal-level data to predict impacts of a contaminant on populations. Current projects include predicting the impacts of PCBs on Atlantic killifish, as well as more locally relevant projects like investigating the implications of using dredged material from Lake Erie as an agricultural amendment. She is already involved in some exciting collaborations within the department and the new Lake Erie Center for Fresh Waters and Human Health.



The Biological Sciences Department welcomed **Dorothy (Dotti) LaForce** in June 2018 as the graduate secretary. Her primary role is assisting graduate students with their progress through the M.S. and Ph.D. programs.

### IN MEMORY

#### **N. William "Bill" Easterly**

We are sad to report that Dr. N. William "Bill" Easterly, professor emeritus, biological sciences, passed away Oct. 26, 2018 at the age of 91. He joined the BGSU Department of Biological Sciences in 1957, where he remained until he retired in 1985. His legacy lives on as a former curator for the BGSU herbarium and as a dedicated professor. In 1979, he completed a 15-year study of the flora in the Oak Openings region and updated the 1928 book by BGSU's first science faculty member Edwin Moseley. His work contained an annotated list of 999 species - 301 more than the original. He also was active in the community, serving as former president and secretary of the Bowling Green Kiwanis Club and as an officer of the National Alliance on Mental Illness of Wood County. His obituary is available at [www.hannemanfh.com/obituary/nathan-bill-easterly](http://www.hannemanfh.com/obituary/nathan-bill-easterly).

#### **Kristen Vessey**

Kristen Vessey, who conducted research and taught in the Department of Biological Sciences from 1972-1998, died Jan. 11, 2018 in Bowling Green. She worked in various labs with Dr. William Jackson (rats), Nancy Seifert (salamanders), and Dr. Arthur Brecher (human hearts) and took courses such as Dr. Jane Forsyth's geology. She earned a Master of Science and a doctoral degree, both in biology from BGSU. In 1998, she transferred to the Center for Environmental Programs where she taught until her retirement in 2006. Her obituary is available at [www.dunnfuneralhome.com/obituaries/obituary-listings?obId=2864483#/obituaryInfo](http://www.dunnfuneralhome.com/obituaries/obituary-listings?obId=2864483#/obituaryInfo)

# Moira van Staaden awarded Professorship of Research Excellence

Biologist Dr. Moira van Staaden has pursued her teaching and research in communication, social systems and the interplay among them from her native South Africa to Europe to the United States, and she has gained a reputation as a top scholar in her field of neuroethology. But in response to what she has observed over her career, and in the past 19 years at Bowling Green State University, she has made the professional decision to also dedicate herself to imparting the joy and methods of science to students and to improving its pedagogy for faculty. Her goals are to encourage and increase study in the STEM disciplines and to develop and share research-based instructional practices for teaching them. In this she has become an internationally recognized expert in STEM education.

In recognition of her extraordinary efforts and achievements, BGSU awarded her a 2018 Professorship of Research

Excellence. The title is conferred upon members of the faculty already holding the rank of professor and who have established outstanding national and international recognition through research and publication or creative/artistic achievement in their disciplines. The title is for a period of three years, with an annual stipend of \$5,000 — a \$3,000 salary stipend and \$2,000 for professional development.

Read more at [www.bgsu.edu/news/2018/04/professorship-of-research-excellence.html?cid=em:zoom:041218](http://www.bgsu.edu/news/2018/04/professorship-of-research-excellence.html?cid=em:zoom:041218)



*Moira van Staaden*

## REGISTRATION OPEN FOR BGSU'S KIDS TECH UNIVERSITY

Can you ride a bicycle and SnapChat at the same time? That's just one of the questions that will be addressed at this year's Kids' Tech University@BGSU. KTU is a science outreach program now in its eighth season at Bowling Green State University that provides a true university experience for children by introducing them to scientists and providing hands-on activities that let kids explore scientific concepts.

The morning sessions feature a talk and extended question period with the invited speaker. Afternoon sessions will include a series of hands-on activities relevant to the session topic that the children can participate in with their parents.

### Topics covered this year will include:

**February 9, 2019** | "Can you ride your bike and Snapchat at the same time?"  
Answered by Jennie J. Gallimore, Ph.D.

**February 16, 2019** | "Flavor is More Than Taste: Adventures in Chemosensory Science"  
Answered by Dr. Mary-Jon Ludy

**March 2, 2019** | "Lakes as recorders of Earth's past climate" - Answered by Dr. Jeff Snyder

**March 30, 2019** | "Plants are just very slow animals" - Answered by Jack C. Schultz

To participate, children must be 9-12 years old as of Sept. 30, 2018. There is a \$100 registration fee to participate. However, scholarship support for registration fees is also available. Contact KTU Program Director Dr. Paul Morris at [pmorris@bgsu.edu](mailto:pmorris@bgsu.edu) for more information.



*Kids Tech participants eyeball algae under a microscope*



*Dr. Peg Yacobucci talks about paleontology during a Kids Tech session*

# Bio:Life

## Biological Sciences Scholarship and Award Recipients

Following is the list of scholarship recipients for 2018-19. This list includes awards for graduating seniors. Congratulations to these outstanding students and special thanks to our donors!

**To view scholarship criteria, please visit:**  
[www.bgsu.edu/biologyscholarships](http://www.bgsu.edu/biologyscholarships).

### **Beta Beta Beta Award**

Bonnie Plickert (Jacksonville, FL)

### **Edward J. Karlin Memorial Scholarship**

Mahnur Khan (Perrysburg, OH)

### **Biological Sciences Alumni Scholarship**

(incoming freshmen)

Dakota Jenkins (Maumee, OH)

### **Jean Pasakarnis Buchanan Junior/Senior Scholarship in Biology**

Kathleen Duwve (Sylvania, OH)

Jordan Hennemyre (Ludlow Falls, OH)

Makayla Manes (Farmdale, OH)

Gabriel Skrobot (Thornville, OH)

### **T. Richard Fisher Biology Scholarship**

Nicolette Salisbury (Lima, OH)

Mary Walther (Whitehouse, OH)

Stephanie Wittman (Marysville, OH)

### **James D. Graham Scholarship**

Evan Blados (West Chester, OH)

Abigail Havice (Fremont, OH)

### **Barbara Long Masters Graduate Award**

(graduate students)

Michael Balinski (Tecumseh, MI)

Meigan Day (Oak Harbor, OH)

Cassidy Florey (Sanford, MI)

Abigail Jarosz (Mayfield, OH)

Josephine Lindsey-Robbins (Woodstock, IL)

Audrey Maran (Toledo, OH)

Preston Thompson (Waterville, OH)

### **Ralph V. McKinney, Jr. –**

#### **Eloise Whitwer Scholarship**

Savanna Brown (Elyria, OH)

Maddison Fortman (Minster, OH)

### **Dr. Suzanne K. Miller-Kobalka Undergraduate Assistantships in Biological Science**

Kelsey Dietrich (Port Clinton, OH)

Eric Noss Jr. (Strongsville, OH)

Erin Soule (Butler, PA)

### **Barry R. Morstain Biology Scholarship**

Monica Florez Garcia (Bogota, Columbia)

Mason Moser (Defiance, OH)

### **Lee Meserve Biological Sciences Scholarship**

Malika Day (Huber Heights, OH)

### **Multicultural Student Scholarship in Biological Sciences**

Azora Sisson-Gorman (Fort Wayne, IN)

### **Linda and Larry Oman Scholarship**

(graduate students)

Justin Burdine (Toledo, OH)

Melanie Marshall (Ada, OH)

Alexandra Steele (Saginaw, MI)

### **Myra L. Patchen Biology Scholarship**

Kristina Gara (Mentor, OH)

### **Dawson S. and Sylvia A. Patterson Scholarship**

Mahra Crone (Defiance, OH)

Cameron Friedman (Pickerington, OH)

### **Robert C. Romans Biological Science Scholarship**

(incoming freshmen)

Megan Carmen (Bowling Green, OH)

Tyler Stull (Bowling Green, OH)

### **Joseph J. and Marie P. Schedel Scholarship**

Emily Eberly (Fairview, PA)

Eric Huber (Lancaster, OH)

Griffin Spilman (Cincinnati, OH)

### **Waldo and Evelyn Steidtmann Scholarship**

Emily Breech (Commercial Point, OH)

Jamie Hawkins (Fletcher, OH)

Karen Potter (Strongsville, OH)

Jarett Trendel (Toledo, OH)

### **Cynthia Collin Stong Marine Biology Scholarship**

Brody Arens (Powell, OH)

Ashtyn Bauer (Hicksville, OH)

Ben Costanzo (Sylvania, OH)

Tara Lanzer (Malinta, OH)

Jacob Murray (Mentor, OH)

Megan Semler (Toledo, OH)

Jarett Trendel (Toledo, OH)

Shane Wever (Goshen, OH)

Kelsi Wygant (Jackson, MI)

### **Harold E. Tinnappel Scholarship**

Nicole Marks (Vermilion, OH)

Trevor Parkes (Toledo, OH)

### **Dennis R. Whitmore Memorial Scholarship**

Katherine Marita (North Olmsted, OH)

Emily Verbrugge (Westfield, IN)

## Biological Sciences Scholarships

Visit [www.bgsu.edu/biologyscholarships](http://www.bgsu.edu/biologyscholarships) for a list of funded scholarships that are available to our undergraduate and graduate students thanks to the generous contributions of alumni, friends and other donors. We thankfully accept donations to any of these scholarships for assistance of our students.

# November 2017 – October 2018 Alumni/Retired and Current Faculty/Staff/Friends Contributions (\$18,365)

Again this year we want to recognize and thank our donors for their generous contributions. If you have provided a monetary gift to the Department of Biological Sciences and are not listed below, please let us know and we will include it in the next newsletter.

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## Biological Sciences General Scholarship Fund

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Michelle Alicia  
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## Electron Microscopy Center

Carol Heckman

## T. Richard Fisher Biology Scholarship

Robert Brodberg  
 Marjorie Smith

## James D. Graham Memorial Scholarship

Fred & Jaclyn Hendricks  
 David McCormick  
 Thomas & Virginia McQuiston

## Edward J. Karlin Memorial Scholarship

Gerald & Paula Levy

## Marine Lab Operations Fund

Patricia Biesiot  
 James & Christine Downing  
 Phyllis Evans  
 Donald Macoy Jr. & Janna  
 Ronald & Janet Partin  
 Michael & Susie Socha

## McKinney-Whitwer Biological Sciences Scholarship

Patricia Bauer

## Dr. Suzanne K. Miller Undergraduate Research Assistantships

Kenneth & Suzanne Miller-Kobalka

## Robert C. Romans Biology Scholarship

Robert Brodberg  
 Lorraine DeVenney  
 Lee & Marge Meserve  
 Terry & Phyllis Morrow  
 John & Bonnie Mucha  
 John Parrish Jr. & Paula  
 Jean Romans (in memory of Dr. Robert Romans)  
 Brent & Carla Takemoto

## Cynthia Collin Stong Marine Biology Scholarship

Patricia Biesiot  
 Michael & Susie Socha

## Cynthia Collin Stong Marine Lab Operations Endowment Fund

Cynthia Collin Stong

## Dennis R. Whitmore Memorial Scholarship

Charles & Marianne Burkett  
 Jonathan & Jane Eby  
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Enclosed is my contribution of:

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- Marine Lab Operations Fund

**Note:** Make checks payable to BGSU Foundation Inc., Dept. of Biological Sciences



## Bio:Life CONTRIBUTORS

Jeff Miner  
 Kelly Stewart  
 Louise Stevenson  
 Tamera Wales



**Bowling Green State University**  
Department of Biological Sciences  
217 Life Sciences Building  
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What might be added to better prepare current students for positions such as yours?  
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