

# ECOVOICE



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Working Group:  
Tracking the  
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Informing the Fight

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Local Action to Fight  
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UGA: Toward Balance



Editor & Writer - Beth Gavrilles  
Designers - Brandon Duncan · Tim Welsh · Benjamin Z. Taylor, AB '17

CONTRIBUTING WRITERS

Amanda Budd, AB '23  
Sarah Buckleitner  
Ethan Hackmeyer, AB '23  
Angela Hsiung  
John King, BS '90  
Maria Lameiras  
Kailah Massey, AB '22  
Irene Wright, AB '21

CONTRIBUTING PHOTOGRAPHERS

Misha Boyd  
Richard J. Hall  
Dorothy Kozlowski  
Beth Newman  
Dot Paul  
Benjamin Z. Taylor, AB '17  
Andrew Davis Tucker

ADMINISTRATION

Dean · John L. Gittleman (through June 2021)  
Interim Dean · Sonia Altizer (as of July 2021)  
Associate Dean for Academic Affairs · John M. Drake  
Associate Dean for Research and Operations · Sonia Altizer (through June 2021)

CONTACT US

To change your mailing address, sign up for Ecovoice E-News updates, or to send news, contact Beth Gavrilles:

E: [bethgav@uga.edu](mailto:bethgav@uga.edu) or PH: 706-542-7247

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A TIME OF TRANSITION AT THE ODUM SCHOOL



After serving for 14 years, John L. Gittleman, UGA Foundation Professor in Ecology, is stepping down as dean of the Odum School as of June 30, 2021, and will transition to a role on the faculty. Sonia Altizer, Georgia Athletic Association Professor of Ecology, has been named interim dean of the school; she will assume her new duties on July 1, 2021.

Gittleman, the school's founding dean, has made "an enduring impact on the field of ecology and on the University of Georgia," according to a statement from Senior Vice President for Academic Affairs and Provost S. Jack Hu. He cited the growth in academic

programs, honors achieved by faculty and students, and Gittleman's national leadership roles on the Scientific Advisory Board of the U.S. Centers for Disease Control and Prevention from 2008 to 2013 and the American Veterinary Medical Association Council on Education.

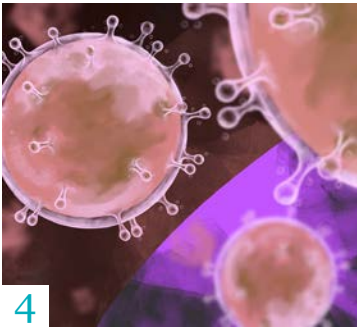
Gittleman shared reflections about his time as dean and what the next chapter holds in an interview that appears on page 32.

Altizer, who joined the faculty in 2005, served as associate dean of academic affairs from 2012-2017 and associate dean for research and operations from 2017 to the present.

"I am confident that Dr. Altizer will provide exemplary leadership as interim dean of the Odum School," said Provost Hu in announcing her appointment. "She has a distinguished record of academic leadership and a demonstrated commitment to excellence in teaching, research and service." He noted her extensive record of scholarly publications, administrative experience, and honors, including election as a Fellow of the American Association for the Advancement of Science.

A Q&A with Altizer, conducted by undergraduate ecology major Amanda Budd, AB '23, appears on page 2.

Please join the Odum community in thanking both Dean Gittleman and Interim Dean Altizer for their service and wishing them well!



Front cover illustration by Hayley Schroeder, BS '18. Hayley is currently pursuing a doctorate at Cornell University, studying how global land use change affects insect interactions with wild plants. [www.hayleythentomologist.com](http://www.hayleythentomologist.com)

Back cover illustration by doctoral student Carol Yang. Carol's research focuses on the role of freshwater crabs in tropical streams. She is co-coordinator of Odum's educational outreach organization EcoReach. [www.ecology.uga.edu/directory/carol-yang/](http://www.ecology.uga.edu/directory/carol-yang/)

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# Q & A WITH SONIA ALTIZER

INTERVIEW BY AMANDA BUDD, AB '23

*Sonia Altizer, Georgia Athletic Association Professor of Ecology, will start her new role as interim dean of the Odum School of Ecology on July 1. She has worked within the school since 2005 and has served in many different roles, including as associate dean since 2012.*

**Amanda Budd:** What kind of initiatives or ideas within the school do you want to promote as interim dean?

**Sonia Altizer:** Our unit recognizes that a commitment to diversity, equity, and inclusion is a centerpiece of a vibrant and engaging school. A top priority is to focus on the recruitment and retention of colleagues that represent gender, racial, and other forms of diversity. We also need to look at ways to sustainably grow our graduate and undergraduate degree programs, while continuing to support rich experiences and a strong mentoring network for our students. In the near term we can also look at ways to increase connections with other units on campus through hiring and interdisciplinary research initiatives.

**AB:** Especially over the past year or so, conversations regarding inequity in STEM have become more prevalent. How do you plan to promote diversity and inclusion within Odum?

**SA:** There are great models for promoting diversity and inclusion through university-wide hiring and mentoring initiatives at the postdoctoral, faculty, and senior leadership levels. We can look to successful efforts at places like Columbia, Emory, Penn State for examples. We also need to listen to our students and junior colleagues who have great ideas for interrupting our 'business as usual' approach.

**AB:** Have you started the transition process into your new role? What has that process been like so far?

**SA:** Yes, Dean Gittleman and I started meeting in April to discuss navigating the role of Dean, and I'm grateful to learn from his example and benefit from his archived notes and advice. We are also recruiting talented faculty to serve new terms as associate deans and in other leadership roles.

**AB:** What challenges are you most looking forward to tackling?

**SA:** Space is a long-standing challenge—both quantity

and quality. We need to create new space and revitalize and rethink existing space use to meet our research and instructional needs. There are some exciting and creative ways to do this, and to simultaneously support new programs and collaborations.

**AB:** What do you want Odum to represent for students, faculty and staff under your leadership?



**SA:** I love hearing about the amazing things our faculty, students and staff are doing, and sharing these stories with people in the community, across the university, and beyond UGA. I would love for Odum to continue to blaze new pathways in ecological research and strengthen our connections with the local and global community.

**AB:** Is there anything else you want us to know?

**SA:** I'd like to thank the faculty, staff and students for their efforts in getting us through the past year and keeping our academic and research programs going during a global pandemic. The people I work with inspire me every day. The coming year will bring challenges, in part as I learn the ropes of the Dean's role, and as our unit adjusts to a different leadership style. I've long said—and continue to believe—that it's hard for me to imagine a better group of colleagues than what we have in the Odum School. It's an incredible place to work.

An expanded version of this interview is online at [t.uga.edu/749](https://t.uga.edu/749)

## ODUM DIVERSITY, EQUITY AND INCLUSION COMMITTEE CREATES ANTI-RACISM ACTION PLAN

Like people around the world, the Odum community was horrified and shaken by the murder of George Floyd by a police officer in Minneapolis on May 25, 2020, the same day a white woman called police and falsely accused Christian Cooper, a Black birder, of threatening her life in Central Park. Together with the killings of Breonna Taylor in Louisville and Ahmaud Arbery here in Georgia, these events and the worldwide protests they inspired injected a new urgency into our efforts to fulfill our stated commitment to be an inclusive and equitable community.

The Odum School's Diversity, Equity, and Inclusion committee was tasked with developing an action plan to guide the school in addressing problems of exclusion and inequity, with an initial focus on combating racial injustice. As the committee wrote in a letter to the entire Odum community on June 5, 2020, "racism is widespread in academia, and our institution is no exception. Our school, like the field of ecology more broadly, continues to be a majority-white institution in which members from underrepresented groups in our community often do not feel supported, included, and cared for...This must change."

The DEI committee—faculty members Rico Holdo (chair), Kait Farrell and Lizzie King, graduate student Joy Vaz, undergraduate student Kailah Massey, and staff members Trippe Ross and Beth Gavrilles (ad hoc)—began by asking students, faculty, staff, and postdocs to share their questions, thoughts, and suggestions for actions that will promote a more inclusive learning and work environment. In response, Odum community members expressed concerns about issues such as the hiring and retention of faculty; the need for diversity in leadership; the importance of inclusive spaces for learning; diversifying course content; the need for lab policies that promote equitable and inclusive workplaces; and ensuring the safety of Black, Indigenous, and People of Color while in the field.

Over the summer, the committee compiled and organized these responses into an initial draft set of proposals and engaged in an extensive effort to gather input on them. Committee members solicited comments at faculty and staff meetings; hosted virtual focus groups of undergraduates, graduate students, and postdocs; and created anonymous online surveys over the course of the fall semester. They spent most of spring semester synthesizing and incorporating the feedback received.

The resulting plan, titled "A Way Forward," lays out a set of short- and long-term actions. The committee

emphasized that while the focus of this plan addresses issues affecting Black and Brown members of our community, their overarching mission is to foster diversity, equity, and inclusion for all who are marginalized and excluded from full participation in ecology, here and as a discipline, because of factors including race, ethnicity, gender identity, sexual orientation, disability, and first-generation college status.

The Way Forward plan is organized into seven categories: training and awareness, development and communication; instruction and curriculum; research and mentoring; community and culture; outreach; and policing and safety. Specific proposals are listed within each category, with timelines and responsible parties identified. These proposals include actions such as offering school-wide anti-racism training; better promoting institutional DEI resources such as scholarships, fellowships, and awards; incorporating inclusive pedagogical practices throughout the curriculum; organizing trainings on effective mentorship of Black, Indigenous, and People of Color; promoting individual reflection and learning about anti-racism; providing more support for community outreach groups like EcoReach that broaden participation in ecology; and developing a set of best practices to ensure the safety of students, faculty, and staff of color while conducting field research.

"This plan represents a first step in an ongoing process," said Holdo. "We expect the plan to be adopted in early Fall 2021."

At the same time as the Odum DEI committee was developing the Way Forward plan, the University of Georgia launched two large initiatives to promote diversity and inclusion on campus more broadly. Members of Odum's DEI committee served as liaisons for these initiatives. The Presidential Task Force on Race, Ethnicity, and Community was formed to explore ways to expand recruitment, retention and leadership development opportunities for faculty, staff, and students from underrepresented groups. And in early May, UGA released its new Diversity and Inclusive Excellence Plan, which is a longer-term comprehensive plan to be incorporated into the University's strategic plan. This plan sets priorities and goals that all units will be required to address in their own plans.

"We're ahead of the curve in terms of formalizing a plan that aligns to the new university standards," said King, Odum's liaison for this initiative. "Our Way Forward plan currently focuses on anti-racism, yet its tenets and action items align with—and in many cases go beyond—the university's plan. By broadening our scope and consideration of other underserved and marginalized groups, the Way Forward plan should be an exemplar of how the university's mission for diversity and inclusion excellence can be pursued at the level of schools, colleges, and departments. We know we still have a lot of work before us, but we've made a start that we hope will give us a strong foundation."



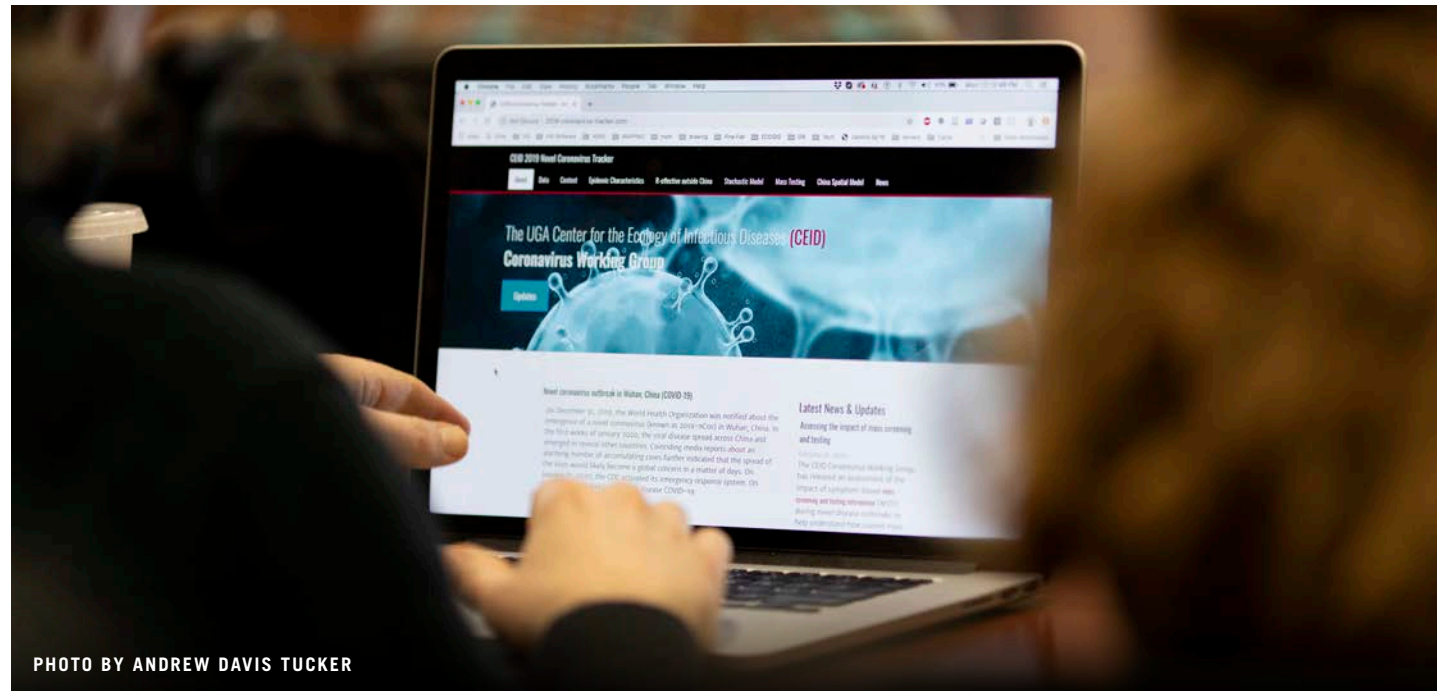


PHOTO BY ANDREW DAVIS TUCKER

## THE CORONAVIRUS WORKING GROUP: TRACKING THE PANDEMIC AND INFORMING THE FIGHT

BY BETH GAVRILLES AND JOHN KING

On January 6, 2020, an article headlined “China grapples with mystery pneumonia-like illness” ran in the *New York Times*. Days later it was followed by reports that Chinese researchers had identified a new coronavirus as the likely source. With no historical data to inform their efforts, public health agencies around the world were soon struggling to respond as the outbreak spread. The need for thorough, immediate analysis of the information that was being collected about the new virus was evident—and exactly the kind of undertaking that the Center for the Ecology of Infectious Diseases was set up to tackle.

Led by John Drake, Distinguished Research Professor and Associate Dean for Academic Affairs in the Odum School, the CEID is a community of faculty, postdoctoral associates, students, and researchers from units across UGA and beyond focused on understanding the interactions of pathogens and hosts in the context of their environment.

Within weeks of the SARS-CoV-2 virus being identified, Drake and his colleagues had formed the Coronavirus

Working Group to help fight the emerging global threat. Members came from the Odum School, College of Public Health, College of Veterinary Medicine, and Franklin College of Arts and Sciences, with expertise in infectious disease ecology, epidemiology, biostatistics, data analysis and visualization, GIS, machine learning, computational statistics, dynamical modeling, and communications.

The group wasted no time getting to work. By early February 2020, they had created the Coronavirus Tracker website to provide up-to-date information and analysis about the rapidly changing conditions of the outbreak. The site, since renamed the COVID-19 Portal, has been updated daily since its launch. It now includes maps of worldwide disease spread; tracks the numbers and rates of U.S. cases, hospitalizations, and deaths; and hosts models that forecast the progression of the pandemic for each U.S. state under different intervention scenarios.

What the group's earliest models and data analysis revealed was that urgent intervention was needed. Drake realized that he needed to get the word out to a far wider audience than typically reads scientific journals.

### COMMUNICATING THE SCIENCE

In early March 2020, as the virus was beginning to spread across in the U.S., Drake wrote an editorial in the *Atlanta Journal-Constitution* sharing some of what he and his team had learned and urging officials to act quickly. “It is tempting to ‘wait-and-see’ how the epidemic progresses before taking action. These data show that we do not have this luxury,” he wrote. “For every 3.8 days we wait, every case will turn into ten. The one thousand cases we have now will turn into ten thousand.”

An analysis completed by Drake and his colleagues in April 2020 estimated that the social distancing measures enacted in Georgia in March, for example, had likely saved 2,900 lives, but that relaxation of those measures would lead to exponential growth of

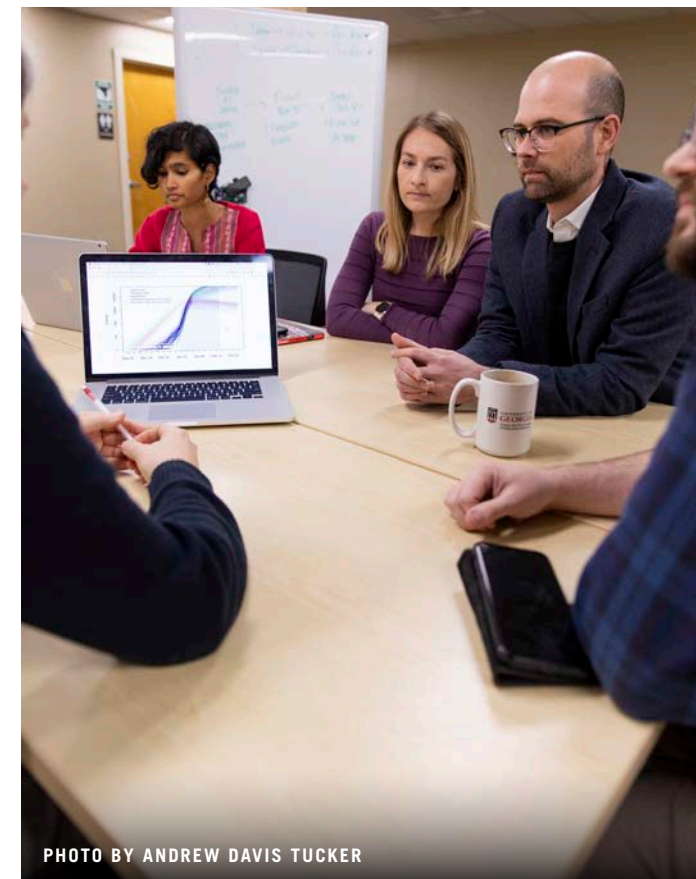


PHOTO BY ANDREW DAVIS TUCKER

cases. “Our models underscore the ease with which the virus can be transmitted, but they also demonstrate the power that everyday citizens have to fight this pandemic through social distancing,” he said.

Drake redoubled his efforts to inform and educate the general public about COVID-19 and the science behind the models and other tools being deployed to fight it. While continuing to lead the team's modeling and analysis work, he began a communication campaign, contributing articles to outlets like ABC's data analysis blog *FiveThirtyEight* and interviews on programs like BBC *Newsday* and the CBS podcast *Debriefing the Briefing*. In

July he joined *Forbes* as an online columnist, providing explanations about the latest scientific results and educating readers about how epidemic models work and what they can tell us about the pandemic. Many of his posts explain key epidemiological concepts like herd immunity and reproductive numbers, while others discuss other topics in the ecology of infectious diseases.

“In one year of writing for *forbes.com*, I have reached more readers than two decades writing technical articles,” Drake said. “Of course, it is essential to document our research and the peer-reviewed scientific literature is the right way of doing that. But science also needs to be interpreted and translated. This is what I am trying to do when I write for *forbes.com*.”

### LOOKING BACKWARD

Now, more than a year after the start of the pandemic, Drake and his colleagues have published new research exploring whether interventions could have been handled differently. Drake, with postdoctoral researcher Kyle Dahlin, Prof. Pej Rohani, and Prof. Andreas Handel of the College of Public Health, developed models to analyze more palatable alternatives to the kind of social distancing mandates that threw a wrench into the ways businesses, schools, and even family gatherings work. They found that the alternatives—widespread testing, contact tracing, quarantines, certification for non-infected people, and other public health policy measures—can slow the spread when combined together, but only with significant investments and broad public compliance.

The study, funded by the National Institutes of Health under Award Numbers U01GM110744 and R01GM123007 and R01 GM 12480-03S1, highlighted the importance of a robust and widespread testing program, the general adoption of non-pharmaceutical interventions like face masks, and targeted measures to globally control the ongoing pandemic. These approaches are still extremely important as vaccines continue to be distributed.

Pej Rohani, Regents' and Georgia Athletic Association Professor of Ecology and Infectious Diseases in the Odum School and College of Veterinary Medicine, said that the models' conclusions indicated the need for continued research.

“These models are important because infectious disease ecologists and epidemiologists need to understand how SARS-CoV-2 transmission can be reduced using measures that do not have extreme societal consequences,” he said.

To learn more, visit the COVID-19 Portal online at [www.covid19.uga.edu](http://www.covid19.uga.edu).





PHOTO BY BENJAMIN Z. TAYLOR, AB '17

## DRAWDOWN GEORGIA: LOCAL ACTION TO FIGHT GLOBAL CLIMATE CHANGE

Jackie Mohan has been studying the impacts of climate change for years. Now, as part of Drawdown Georgia, she's helping to fight it.

Drawdown Georgia is a collaboration among researchers from UGA, Georgia Tech, Georgia State, Emory, and the Ray C. Anderson Foundation to find and develop local approaches to tackling climate change. The goal is to lower Georgia's carbon emissions as much as possible—and by at least one third of what they are today—by 2030.

The initiative is based on the work of Project Drawdown, a nonprofit organization dedicated to helping achieve “the future point in time when levels of greenhouse gases in the atmosphere stop climbing and start to steadily decline,” according to the group's website. The project consists of a suite of proposed actions to reduce emissions and protect and expand carbon sinks, all while fostering an equitable society.

Drawdown Georgia, which launched in 2020, is the first initiative to apply the methodology at the state level.

“We started with solutions at the global scale, so the first step was whittling down to what's worth thinking about in the state of Georgia,” said Mohan, an associate professor in the Odum School of Ecology.

She and her colleagues evaluated potential solutions based on whether they were technology and market ready, whether there was local expertise available to implement them, whether they were cost-competitive, and whether they would provide enough impact by the target date of 2030. They also examined likely effects on the economy, the environment, public health, and equity.

The proposals that made the cut were organized into five categories, each with a working group assigned to it: electricity, buildings and materials, food and agriculture, land sinks, and transportation.

Mohan leads the land sinks working group with Puneet Dwivedi of the Warnell School of Forestry and Natural Resources. The food and agriculture group is led by Sudhagar Mani of the College of Engineering and Jeff Mullen of the College of Agricultural and Environmental Sciences. Marshall Shepherd, Georgia Athletic Association Distinguished Professor of Atmospheric Sciences and Geography, represents UGA on the project's core leadership team.

### FORESTS IN A WARMING WORLD

Drawdown Georgia was a natural fit for Mohan, who has been studying the effects of climate change on forests since she was a doctoral student at Duke University. Today her research is conducted primarily at her Whitehall Forest soil warming facility in Athens, with the goal of understanding the short- and long-term implications of rising temperatures for forests in Georgia and other parts of the Southeast.

Over the past ten years, she and her students have planted thousands of trees in experimental plots where they raise the soil temperature by different amounts, with some plots left untouched as controls. They regularly measure outcomes like tree growth and survival, susceptibility to herbivory, the chemical composition of leaves, and the amount of carbon dioxide flowing from the soils to the atmosphere. Her findings complement a larger body of soil warming research, which she pulled together for her 2019 textbook *Ecosystem Consequences of Soil Warming: Microbes, Vegetation, Fauna and Soil Biogeochemistry*.

Mohan has found that southeastern forests respond very differently to soil warming than do those in northern regions.

“Heating up the soils, at least in the northern forests where primarily the soil warming research has occurred,

generally it's like heating up a compost heap,” Mohan said. “You're increasing the rate of microbial decomposition, and that converts the carbon in organic matter to carbon dioxide, which goes to the atmosphere. Apparently when we're warming up the different northern biomes on the planet, we're increasing the rate of carbon flow from soils to the atmosphere. But we don't seem to be seeing that in our subtropical soils of the Piedmont in Athens, Georgia. So that would be good news.”

### THE ROLE OF GEORGIA'S FORESTS, FIELDS, AND MARSHES

Mohan's findings, combined with extensive literature reviews, have informed the recommendations developed by the Drawdown Georgia land sinks group. These have focused on ways to increase the amount of carbon stored by Georgia's forests, coastal wetlands, and pastures. Together, these land types make up roughly two-thirds of the state and sequester up to 46 megatons of carbon per year. The group calculates that's enough to offset

that expanding forest acreage by just 2.9% would result in an additional megaton of carbon sequestered in 2030, and that sequestering another 2.3 megatons is an achievable goal.

Mohan said that the benefits would go beyond reducing carbon dioxide emissions, however. Forests cover roughly 60% of Georgia and have a major economic impact—the Georgia Forestry Commission estimates that forests contributed \$36.5 billion to the state's economy in 2019 alone—as well as filtering pollutants from the air and water, providing wildlife habitat, and offering recreational opportunities.

“With our long growing seasons here in the South, we are perfectly primed to expand,” said Mohan.

Likewise, the practice of silvopasture has many positive consequences. “Agricultural scientists have studied this and it turns out that providing pasture animals some shade not only makes them happier, it makes them healthier and it makes them more productive,” said Mohan. “So there's a benefit, an economic benefit, as well as a carbon benefit, of planting maybe 7% of the current pastures with trees. It's a win-win-win.” If combined with afforestation, Mohan and her colleagues found, expanding the use of silvopasture could store an additional 2.8 megatons of carbon dioxide by 2030.

Finally, Georgia's more than 420,000 acres of coastal marshes store approximately 1.4 megatons of carbon per year, while providing crucial habitat and serving as nursery grounds for migratory birds, fish, and other ocean life. They also act as a buffer against storm surges and hurricanes, protecting the lives and property of people living inland. Safeguarding them from development and acquiring buffers that would allow them to expand is another important solution.

“Coastal wetlands pull more than their weight in terms of providing benefits to people and to biodiversity,” said Mohan. “And we really need to think about coastal migration, because as sea levels rise, the coasts need to be able to migrate inward and shoreward.”

Mohan and the other Drawdown Georgia researchers published a summary of their proposals, “Translating a Global Emission-Reduction Framework for Subnational Climate Action: A Case Study from the State of Georgia,” in the journal *Environmental Management* in January 2021. The project is now beginning its second phase, which involves assessing implementation of the proposed solutions.

“Our group is going a little above and beyond this,” said Mohan. “We're working to see what we can do to make them more likely to be implemented. For instance, we don't have very much silvopasture right now in the state of Georgia. Why is that? And I think probably the most sensible thing for us to do at this point is to figure that question out and then to figure out potential solutions to obstacles perceived or real.”

For more information on the project, visit [www.drawdownga.org](http://www.drawdownga.org).



PHOTO BY PAUL EFLAND

more than a quarter of Georgia's emissions; their goal is to see that increase by at least five megatons by 2030.

Their proposals include restoring, protecting, and increasing the acreage of Georgia's forests; maintaining protections for coastal wetlands; and expanding the use of silvopasture and afforestation—the planting of trees in places that once were forested, including degraded farm fields and pastures.

Mohan and her group estimated that between tree biomass and soils, Georgia's forests are currently storing up to 30 megatons of carbon per year. They calculate



# THE FIRST EARTH DAY AT UGA: TOWARD BALANCE

The morning of April 22, 1970, was clear and sunny in Athens, and the atmosphere was both urgent and hopeful as crowds of students, faculty and local residents made their way to Memorial Hall on the University of Georgia campus. The first observance of Earth Day was about to get underway.

"It was a time of doing, of huge anxiety because of the war, but also some optimism that we could turn things around on the planet," said Chris D'Elia, PhD '74, one of the event's organizers who is now the dean of the College of the Coast and Environment at Louisiana State University. "It was a really big thing."

The spring of 1970 was a time of uncertainty. Martin Luther King Jr. and Bobby Kennedy had been assassinated two years earlier. The conflict in Vietnam was raging, and anti-war protests were spreading across the U.S.

the University of Georgia, where organizing efforts were led by students and faculty from the Institute of Ecology and the newly-formed student organization Balance.

"Balance was a group of graduate students from different disciplines on campus," said Julia Krebs, PhD '77, who served as the group's secretary and is now professor emerita of biology at Francis Marion University. "Most of us were biologists or ecologists, but there were students from all over, and of course, the faculty were very supportive."

The main objective of Balance, according to its statement of purpose, was informational. "In this time of environmental crisis both impending and existent, we feel it is necessary that the public be informed in the basic principles of ecology and be made aware of the problems facing the human species in relation to its environment.



Concern about the state of the environment was rising too, galvanized by *Silent Spring*, Rachel Carson's 1962 bestseller about the toll rampant pesticide use was taking on birds and other wildlife. Smog routinely blanketed many of America's major cities, and millions of gallons of raw sewage and chemical wastes were pouring into the nation's rivers and streams every day. *Time Magazine* had recently run a story that featured the heavily polluted Cuyahoga River in Cleveland, Ohio, so full of oil and other wastes that it burst into flames in 1969.

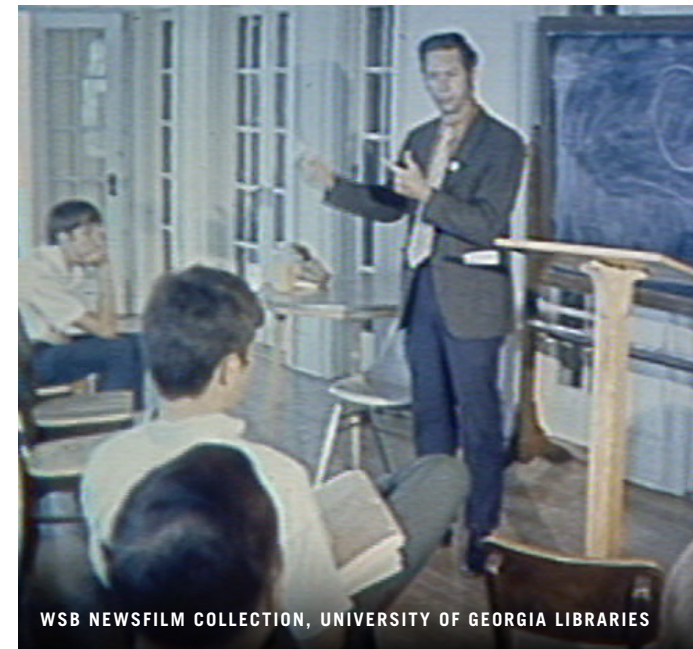
It was against this backdrop that the first Earth Day was conceived by Sen. Gaylord Nelson of Wisconsin. Dismayed by witnessing the results of a catastrophic oil spill off the coast of Santa Barbara, Nelson was inspired to launch a national "teach-in on the environment," to take place at colleges and universities across the U.S. on April 22, 1970.

The idea was enthusiastically embraced, including at

It is to this end that Balance is dedicated," the organizers wrote.

"The first Earth Day at UGA was a natural extension of the faculty and student interests to understand how the world was changing, to figure out the patterns, and to do something beyond our everyday cocoons," said R. Eugene Turner, PhD '75, a graduate student in the Institute of Ecology who helped plan the UGA events; he is now the LSU Boyd Professor of Oceanography and Coastal Sciences at LSU.

The teach-in they designed—one of thousands held across the country that day—focused on educating the public about ecology and our relationship to it, analyzing the roots and scope of the ecological crisis, and exploring alternative options. Thanks to the group's remarkably successful efforts at publicity, it drew an estimated 3,000–5,000 students and community members—an



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impressive number given that UGA's total enrollment was just under 18,000 at that time.

"The thing that I remember the most was how actively people participated," said D'Elia. "It was big for the university and many people were involved, many students were involved."

Classes were cancelled for the day as attendees packed Memorial Hall classrooms from 9 a.m. to 6 p.m. to hear talks on topics like the principles of ecology, environmental planning, agriculture, forest resources, water pollution, and waste disposal. Most of the speakers were faculty members and graduate students recruited from all over campus. Besides the Institute of Ecology, speakers came from units including the schools of Environmental Design, Social Work, Law, Forestry, and Agriculture, and the departments of psychology, music, and philosophy and religion.

Memorial Hall was filled with exhibits and informational tables hosted by organizations ranging from the long-established Sierra Club to the newly formed local group Consumer Action, where the focus was on what individuals could do to protect the planet and reduce pollution. The Georgia Museum of Art hosted a temporary installation in its foyer, a mound of earth created over several days by students who contributed handfuls of soil collected from all over Athens. And students created an Earth Day publication, *Toward Balance*, that covered many of the topics featured at the teach-in.

The day's events were capped with a talk by Eugene Odum, the founder of the Institute of Ecology. He compared Earth's environmental crisis to the Apollo 13 mission, which just a few days before had nearly ended in tragedy when an explosion caused a significant loss of oxygen, leaving barely enough to sustain all three crew members. Odum asked what kind of choice the astronauts would have had to make if there had only been enough

oxygen for two. "Let's don't get the Earth's spaceship where we have to make that kind of decision," he said. "We need to chart another course."

## THE AFTERMATH

In an interview on the UGA radio program *University Almanac* on the one-year anniversary of Earth Day, Odum reflected on the impact of the event.

"Last year I think the activities resulted in a general awareness from everyone of the seriousness of environmental problems," he said. "And what we observed during this past year is a kind of quiet revolution in attitudes, and you might say that the activism has gone to the individual and group level."

This "quiet revolution" would usher in the passage of landmark federal environmental legislation over the next decade. The Clean Air Act, the Toxic Substances Control Act, the Endangered Species Act and the Safe Drinking Water Act, among others, have led to substantial improvements in many aspects of environmental health.

Earth Day changed the lives and experiences of UGA participants in other ways too.

"I hope we did something for the environment, or for achieving balance between human beings and the rest of nature, but we also did a lot for ourselves," said Krebs. "It was an opportunity to work together on something that you believe in. We talked a lot about the issues, and we learned a lot. It was a wonderful little community."

The members of Balance took on new initiatives. They organized a letter-writing campaign to urge the Dept. of Agriculture to extend its ban on DDT. They staged actions like creating a display of ash from the coal-fired power plant that formerly operated on the UGA campus. They created a mail-in information service and a speaker's bureau.

"By participating in Earth Day, we were willing to do more, or were aware that we might be able to do more," said Turner, who was one of the speakers dispatched to address environmental topics at the request of civic groups and schools. "I went to Milledgeville to give a Kiwanis or a Rotary talk, and I'd never done anything like that before. But we were being encouraged to do things like that. It was a precursor to the kind of outreach we're doing now," he said.

"That first Earth Day was a watershed event for me in several ways," said Regents' Prof. Emeritus Bernard Patten, who was a faculty advisor to Balance and contributed an essay to *Toward Balance*. "The memory and the energy unleashed by it are still alive and active drivers in my life."

Looking back on the occasion of the fiftieth anniversary of the first Earth Day, D'Elia reflected on its continuing relevance.

"I remember the issues that were driving us then, and they're many of the same issues today," he said. "And it's kind of the Odum value that I carry with me today, that we need to have a balance on the planet of ecosystems that help support us with our human systems."



## LONG-TERM DATA REVEAL IMPACT OF BARRIERS AND DROUGHT ON MIGRATORY SHRIMP IN PUERTO RICO

BY ANGELA HSIUNG

From the ocean surrounding Puerto Rico, masses of shrimp begin their journey inland, climbing toward their freshwater birthplace. As larvae, these shrimps migrate downstream through rivers and streams into the ocean where they mature before beginning their upstream migration to the headwaters to mate and produce offspring.

A growing number of dams, combined with seasonal changes in water availability, have made it increasingly difficult for the shrimp to reach their destinations, according to a 2020 study from the University of Georgia. The research, based on 37 years of streamflow data from El Yunque National Forest, found that connectivity declined by 27% as low-head dams were installed to accommodate drinking water intakes in the lower reaches of area watersheds.

“Migratory shrimp provide important ecosystem services for the El Yunque streams,” said lead author Jessica Chappell, PhD ICON & Ecology ’19. She explained that shrimp break down leaf litter, facilitating nutrient cycling; keep water clear by reducing sediment and algae buildup; and serve as a food source for other aquatic species. “So it’s important to have these shrimp populations maintained in the system,” she said.

Low-head dams are built to create pools of water deep enough to submerge drinking water intakes for local municipalities. Previous research has shown that Puerto Rico’s freshwater shrimp are able to overcome barriers like dams and waterfalls up to 100 feet high, but only when water is flowing over them. When water levels are too low to allow that, even the much smaller low-head dams are insurmountable.

Not being able to reach the ocean could potentially reduce survival of larval shrimp, while failure to reach spawning ground could reduce adult shrimps’ ability to reproduce; both could cause population decline.

To help water resources managers make decisions that have less impact on the shrimp populations in Puerto Rico, Chappell and colleagues evaluated how human-built structures affect habitat connectivity for shrimp, both over the long term and month-by-month. In particular, they were interested in the effects of drought and dry seasons, as well as the locations of dams and water intakes.

The researchers analyzed monthly water discharge, collected by U.S. Geological Survey water gauges, and withdrawal data in seven watersheds within El Yunque

from 1980 through 2016. They found that total habitat connectivity decreased by 27% and connectivity of refugia habitat—areas the shrimps’ predators are unable to reach—decreased by 16% over the 37-year span. “This really highlighted the importance of thinking about intake location within the watershed,” said Chappell. “The lower down they are in the watershed, there’s the possibility of disconnecting the whole watershed if that one barrier completely blocks water movement.”

Chappell and her colleagues also modeled changes in connectivity during drought years and dry seasons. They found that habitat connectivity for migratory shrimp decreased during drought years by 17% compared to non-drought years. Additionally, connectivity decreased by 7% in the study area during the dry season compared to the wet season.

Taken together, the addition of dams in the lower reaches of El Yunque’s watersheds combined with seasonal changes in water availability have made it more difficult for migratory shrimp in Puerto Rico to move between habitats. And with climate change projected to lead to prolonged dry seasons throughout the Caribbean, connectivity may be reduced even further.



PHOTO BY JESSICA CHAPPELL

Chappell said she hopes that the study’s findings will help water resources managers make decisions to meet the needs of people while taking into account the needs of Puerto Rico’s freshwater shrimp.

Coauthors of the paper, “Long-term (37 years) impacts of low-head dams on freshwater shrimp habitat connectivity in northeastern Puerto Rico,” are S. Kyle McKay, PhD ’14, of the U.S. Army Corps of Engineers, Mary C. Freeman of the U.S. Geological Survey and the Odum School, and Prof. Catherine Pringle. Support came from the National Science Foundation, the International Institute of Tropical Forestry, the USDA Forest Service, the U.S. Army Corps of Engineers Ecosystem Management and Restoration Research Program, and UGA. It was published in *River Research and Applications*. It is available online at [doi.org/10.1002/rra.3499](https://doi.org/10.1002/rra.3499).

## “EMERGE,” NEW PROGRAM TO CREATE ENVIRONMENT OF INCLUSION IN FRESHWATER SCIENCE, RECEIVES NSF FUNDING

BY IRENE WRIGHT, AB ’21

A new project of the Society for Freshwater Science, led by Odum School ecologists Amy D. Rosemond and Amanda T. Rugenski with colleagues from other universities, aims to create an environment of inclusion in freshwater ecology. “Emerge: Broadening Participation and Leadership in Freshwater Science” is funded with a five-year \$2 million grant from the National Science Foundation.

“For all of us in STEM—science, technology, engineering and math—you realize the millions of people we’re leaving behind. In ecology, in freshwater science, we’re still very culturally homogenous,” said Rosemond. She argued that scientists have created a culture of exclusion, failing to recognize value systems that are important to others, as well as creating barriers to scientific integration.

Emerge, which is open to undergraduates, graduate students and early career scholars, is designed to break down those barriers. It builds on the existing SFS “Instars” mentoring program, which is named for an early life stage of aquatic insects. Instars is part of a 10-year commitment by SFS to provide welcoming spaces and growth experiences for students from groups under-represented in STEM fields, including those based on race, ethnicity, disability, sexual orientation, gender identity, and first-generation college status.

“Scientific societies have a huge capacity to change the culture of science,” Rosemond said, “and with the critical need for increased diversity in STEM, it seemed urgent for SFS to grow opportunities for engagement with scholars from under-represented and marginalized groups.”

The Emerge program will connect students and young professionals from around the country with a shared passion for inclusion and freshwater science, building capacity for participants to develop networks and skills with activities throughout the year. The program is based on three processes that have been identified to facilitate retention in science: self-efficacy, science identity, and shared values. Activities such as advanced skill-building workshops are designed to provide knowledge while strengthening the science identity of participants. And by working together throughout the program, Emerge participants and mentors can develop a communal commitment to diversity and inclusion that can further

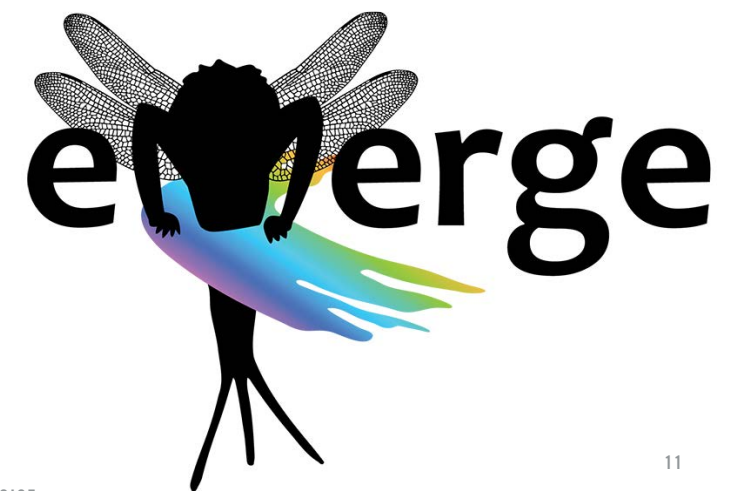
inspire the whole organization.

“You haven’t made an inclusive environment until it becomes important to everyone and a shared value,” Rosemond said. “SFS hopes to lead in creating a model of a supportive and affirming scientific society, particularly for people who have had to face barriers in our field due to their identity.”

Like program participants, the founders of Emerge come from a variety of cultural, scientific, and academic backgrounds, integrating research and experience from four universities. Along with Rosemond and Rugenski, the undergraduate program coordinator in the Odum School of Ecology at UGA, they include Checo Colón-Gaud, professor of biology and associate dean of graduate studies at Georgia Southern University; Patina Mendez, lecturer in environmental science, policy, and management at the University of California, Berkeley; and Daniel McGarvey, associate professor of environmental studies at Virginia Commonwealth University. Program coordinator Breanna Ondich, based at the University of Georgia, shared her excitement about the first year of Emerge and the impact it could have, remaining optimistic despite the setback of a remote start due to the COVID-19 pandemic.

“We are one of the first scientific societies to be leading the way here, and it’s exciting to wonder what it will be like in ten years,” Ondich said. “I’m excited to see what the future holds.”

For more information and to apply to the Emerge program, visit [bit.ly/sfs-emerge](https://bit.ly/sfs-emerge).







## COMPREHENSIVE STUDY REVEALS AN UNEXPECTED ROLE OF FIRE IN LONGLEAF PINE FORESTS

The longleaf pine forests of the southeastern U.S. depend on frequent fire to maintain their structure and the diversity of plants and animals they support. But fire may also be playing another, unexpected role: releasing excessive nitrogen that appears to have accumulated as a legacy of prior land use.

Those were among the findings of a five-year study led by Assoc. Prof. Nina Wurzburger with funding from the Strategic Environmental Research and Development Program of the U.S. Department of Defense in partnership with the U.S. Department of Energy and the U.S. Environmental Protection Agency.

The Department of Defense uses controlled burning to manage the hundreds of thousands of acres of longleaf forests on southeastern military installations, which are located for the most part on land that was formerly used for farming, grazing, and forestry until their acquisition by the DOD in the 1930s. While fire is essential to these systems, it also releases nitrogen from the soil. Wurzburger wanted to learn whether enough of this essential nutrient was being returned to balance what was being lost to ensure continued forest growth.

To find out, she and her team established 54 2.5-acre plots, 30 at Eglin Air Force Base in Florida and 24 at Fort Benning in Georgia. They included both planted and naturally regenerated stands of trees with ages ranging from two years to 227 years old, and with different fire return intervals from 1.5 to 20 years.

For each plot, they calculated how much nitrogen was being fixed by bacteria that associate with the ecosystem's legumes or live in the soil, or that was deposited from sources like rainwater and fertilizer-laden dust from nearby agricultural fields. Then they calculated the amount of nitrogen being lost to fire, comparing soil and vegetation samples from before and after each fire event from each plot.

While there were differences depending on site

location, stand age, and fire frequency, overall they found a substantial deficit in nitrogen inputs compared to outputs. On average, only 38% of nitrogen lost to fire was being replenished through fixation and atmospheric deposition. But they also found, to their surprise, that despite those losses there was plenty of nitrogen in the soil and no evidence of a decline in tree growth.

"Most of the longleaf pine that exists today has been planted, and those areas have legacy effects of agriculture or grazing or fire exclusion," said Wurzburger. "Our research is suggesting that all those things, and nitrogen deposition too, have put too much nitrogen in the ecosystem. So maybe we should think about fire as a management tool to remove nitrogen that accumulated historically, and to help return these ecosystems to their natural nitrogen-poor state."

Understanding the interacting role of fire and historical disturbances in longleaf ecosystems is important for several reasons, including carbon sequestration and the conservation of biodiversity: longleaf savannas can contain more than 40 species of plants in a square meter, and harbor a number of rare species of plants and animals, including the federally endangered red cockaded woodpecker.

"There have been tons of efforts for the past couple of decades to replant stands of longleaf pine and restore this important ecosystem for endangered species," said Julie Tierney, MS '17, lead author of a paper in *Ecology* documenting the findings. "In order to inform management decisions, we need to understand what is happening to the biogeochemistry of this system, what's happening to nutrients that supposedly limit the growth of these trees."

The study, "Nitrogen fixation does not balance fire-induced nitrogen losses in longleaf pine savannas," was co-authored by Lars Hedin of Princeton University. It is available online at [doi.org/10.1002/ecy.2735](https://doi.org/10.1002/ecy.2735).

## EVOLUTION OF THE FASTEST JAWS IN NATURE: FUNCTION BEFORE FORM IN MINIATURE TRAP-JAW ANTS

BY MARIA M. LAMEIRAS, UGA CAES NEWS

Trap-jaw ants are famous for having one of the natural world's fastest movements, and a new study led by UGA Ecology alumnus Doug Booher, BS '98, shows that the core mechanism that allows this speedy movement evolved multiple times within a single ant genus, leading to the spectacular diversification of mandible shape each time.

The ants use their fast jaws to catch their similarly fast prey, springtails, which themselves have a spring-loaded escape mechanism. The new findings may explain why the mechanism has evolved so many times independently around the world, eventually developing into the animal kingdom's fastest-accelerating resettable part.

The study, "Functional innovation promotes diversification of form in the evolution of an ultrafast trap-jaw mechanism in ants," was published March 2, 2021 in the open-access journal *PLOS Biology*. Booher, an honorary associate of the UGA Collection of Arthropods at the Georgia Museum of Natural History, where much of the research was conducted, with Evan Economo

of the Okinawa Institute of Science and Technology Graduate University and colleagues found that the core latch-spring mechanism that drives the jaws of trap-jaw ants evolved independently seven to 10 times in a single ant genus, *Strumigenys*, resulting in the repeated evolution of diverse forms on different continents.

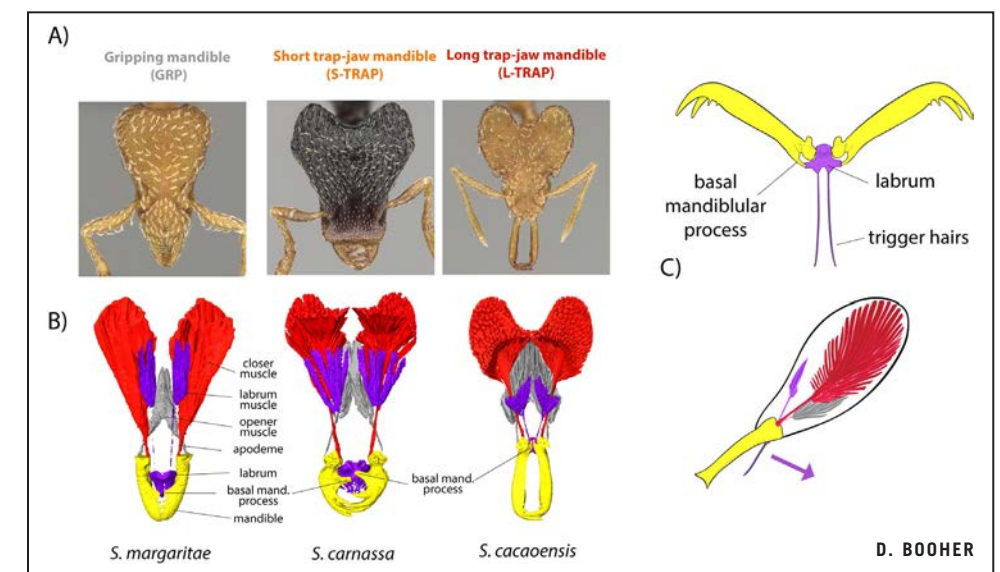
"When the miniature trap-jaw ant genus arose about 35 million years ago and slowly dispersed globally, they did not have the current trap-jaw mechanism that is now present in at least seven lineages within the *Strumigenys* genus of ants," said Booher, who is currently a postdoctoral researcher at Yale. "It is significant that a biologically complex trait evolved independently in each biogeographic realm, resulting in species that look nearly identical in different regions but do not share common ancestors."

Evolutionary change is marked by occasional breakthroughs in the design of organisms, often involving the reorganization of parts into new functional systems.

But understanding how transitions in function evolve in multiple interacting parts remains a major challenge.

"It is a significant finding to understand how relatively small changes of the same morphological features promoted the convergent evolution in biologically complex trap-jaw mechanisms – with each trap-jaw evolution resulting in similarly extreme mandible performance," Booher said. "The seven or more trap-jaw lineages include many ant species that are millions of years apart from sharing a common ancestor that looks completely different, without trap jaws. The result is that these trap-jaw species often look alike and occur in completely different places."

Most diversification of shape—from short triangular jaws to long slender ones—occurred after the evolution of latch-spring mechanisms, which can evolve through only very minor realignments of mouthpart structures. The finding that incremental changes in form lead to a change of function, followed by large morphological reorganization around that new function, provides a model



for understanding the evolution of complex biomechanical traits, as well as insights into why such innovations often happen repeatedly.

As a byproduct of the research, Booher also has been able to identify at least 200 species of *Strumigenys* that have not been described, but that were being held in museum collections around the world, and has submitted or published studies describing 11 new species in the past year. He named his first new species *Strumigenys hubbewatyorum* after his advisors, Professors Emeriti Patricia Adair Gowaty, ecology, and Stephen Hubbell, plant biology.

The paper, "Functional innovation promotes diversification of form in the evolution of an ultrafast trap-jaw mechanism in ants," is available online at [doi.org/10.1371/journal.pbio.3001031](https://doi.org/10.1371/journal.pbio.3001031). Booher recently named another ant for an Athens friend, the late Jeremy Ayers. You can read more about *Strumigenys ayersthey* at [bit.ly/sayersthey](https://bit.ly/sayersthey).



# RESEARCHERS MODEL THE EFFECTS OF SEASONAL ANIMAL MIGRATION ON DISEASE TRANSMISSION

BY KAILAH MASSEY, AB '22

Long-distance animal migrations can trigger relapse of dormant infections, influencing when and where infection risk peaks, according to research led by Odum School alumnus Daniel Becker, PhD '17, and Asst. Prof. Richard Hall. Their findings, published in *Proceedings of the Royal Society B*, have implications for conservation and public health.

With Ellen Ketterson of Indiana University, Becker and Hall developed a mathematical model that describes the annual cycle of a migratory animal, including a breeding season, a migration season, and an overwintering season. It shows that for deadlier and more easily transmitted pathogens, migratory relapse can reduce infection across the annual cycle by culling infected hosts during travel.

"Infection carries costs, and if you thought about running a marathon while having the flu, it would be very hard to complete the marathon," said Hall.

For more benign pathogens that typically don't kill their hosts, however, relapse can amplify infection throughout the year, and may play a key role in maintaining those pathogens in migratory populations.

"For some infections carried by migratory birds, including avian malaria and the bacteria that causes Lyme disease in people, the animal doesn't fully clear the infection, but instead the infection goes dormant until a stressful event like migration allows it to reactivate," Hall said. "In this case, reactivating dormant infections can cancel out the loss of infected animals that die during migration, and can lead to an increase in the number of infected animals throughout the year."

The study is among the first to investigate how relapsing infections influence the seasonal timing of infection risk in migrants.

"When you do not include relapse, generally we find that infection peaks at the sites where animals spend the most time together, such as the breeding or wintering sites," said Becker, at the time of the research a postdoctoral fellow at Indiana University. "However, relapse can cause more animals to be actively infectious during migration, potentially exposing other species they encounter on their journeys, including humans."

Another factor the researchers considered was environmental change, which has altered migration patterns. "Many animal migrations are in decline, and some animals are forgoing migration altogether. This is why we want to study how migration influences parasitism, and what happens to infection patterns as

migrations become less common," Hall said.

The model results suggest that in some cases, a shift from migratory behavior to residency could result in fewer infections, as latent infections are not reactivated. However, for deadlier pathogens the opposite is true. In the absence of the energy demands of migration, infected animals could be less likely to succumb to infection and could thus cause more transmission.

Hall emphasized the need for surveillance to conserve migratory bird populations and to safeguard public health. "One motivation for this study is because migratory animals increasingly share habitats with domestic animals and people, where they could be exposed to novel pathogens that could exacerbate their declines. Alternatively, they could carry diseases that are of public health concern over large distances. This study highlights that surveillance for potentially zoonotic diseases along migratory routes, not just in breeding or wintering areas, is essential," he said.



THE RUSTY BLACKBIRD TYPICALLY MIGRATES FROM NORTHERN CANADA TO THE UNITED STATES DURING WINTER. PHOTO BY JESSICA CHAPPELL

Funding for the research was provided by the Intelligence Community Postdoctoral Research Fellowship Program, administered by Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and the Office of the Director of National Intelligence; Indiana University; and the National Science Foundation. The paper, "Reactivation of latent infections with migration shapes population-level disease dynamics," is available online at [bit.ly/3dTEOrh](https://bit.ly/3dTEOrh).

# CORAL REEFS SHOW "ECOLOGICAL MEMORY" AND RESILIENCE TO RISING TEMPERATURES

Rising ocean temperatures have devastated coral reefs all over the world, but a recent study in *Global Change Biology* has found that reefs in the Eastern Tropical Pacific region may prove to be an exception. The findings, which suggest that reefs in this area may have adapted to heat stress, could provide insights about the potential for survival of reefs in other parts of the world.

"Our 44-year study shows that the amount of living coral has not changed in the ETP," said Prof. Emeritus James W. Porter, the paper's senior author. "Live coral cover has gone up and down in response to El Niño-induced bleaching, but unlike reefs elsewhere in the Caribbean and Indo Pacific, reefs in the ETP almost always bounce back," he said.

The study was conducted by an international team of researchers from across the region led by Dr. Mauricio Romero-Torres of the Pontificia Universidad Javeriana and Unidad Nacional para la Gestión del Riesgo de Desastres (the National Unit for Disaster Risk Management, or UNGRD) in Bogotá, Colombia. The group examined coral cover data for the area, which stretches from Baja California to the Galapagos Islands, from 1970–2014. During that time there were several El Niño events—periods when the equatorial Pacific Ocean reaches unusually high temperatures. Excessive heat can kill the symbiotic algae that inhabit the corals, leading to widespread coral bleaching and death.

The researchers found that while losses of coral cover followed the worst of those episodes, in many cases ETP reefs recovered within 10–15 years.

"So much of my career has been spent documenting coral reef decline that to discover a large area of the tropics where coral reefs are holding their own is very gratifying," said Porter.

He and his colleagues hypothesized that several key factors allowed the ETP reefs to bounce back.

First, corals in this area are mostly pocilloporids, a type of coral that reproduces at high rates. They also contain species of symbiotic algae that are particularly tolerant to extreme temperatures.

Patterns of weather and geography in the ETP may also play a role. Areas having heavier cloud cover or upwelling of cooler waters may survive locally and be able to reseed more severely affected reefs elsewhere.

Another important factor may be "ecological memory," meaning that ETP corals may have become conditioned to heat stress over the years, through mechanisms such as genetic adaptation and epigenetic inheritance, whereby

parents pass on these survival traits to their offspring. "The key to survival for future reefs may not be an immunity to stress, but rather an ability to recover and regrow after stress," said Porter. "ETP reefs show us what this might look like."

Porter said that the study is also important as an example of the need for maintaining long-term original data, which was crucial to the research.



PHOTO BY DAVID A. PAZ-GARCIA

"As soon as Dr. Romero contacted me, I consulted my original dive logs, made when I was a Smithsonian Pre-Doctoral Fellow in Panama in 1970," said Porter. "I realized immediately that my hand-written field notes contained everything needed to anchor this study with the oldest data (1970) used in this long-term survey. Particularly in a changing world, we need to archive and store original data carefully," he said. "Knowing what the world looked like in the past may be the best way to set restoration goals in the future."

"This research teaches the relevance of doing science with FAIR standards (findable, accessible, interoperable and reusable) so that other researchers in the region can continue the work and estimate the effects of the next El Niño phenomenon on the ETP," said Romero.

The study, "Coral reef resilience to thermal stress in the Eastern Tropical Pacific," was supported by Colciencias (the Colombian Department of Science, Technology and Innovation) and Colfuturo (the Foundation for the Future of Colombia), Pontificia Universidad Javeriana, UNGRD and the Kirbo Charitable Trust. It is available online at [doi.org/10.1111/gcb.15126](https://doi.org/10.1111/gcb.15126).



# DISEASE ECOLOGY RESEARCH BRIEFS

## TOXIC POLLUTANTS CAN IMPACT WILDLIFE DISEASE SPREAD

Exposure to toxic pollutants associated with human activities may influence the spread of infectious diseases in wildlife, according to a 2020 study led by Cecilia Sánchez, PhD '19, with implications for both human health and wildlife conservation. Researchers built a mathematical model to explore how toxic substances affect wildlife health and mobility, and how those effects in turn influence wildlife populations and the risk of disease spillover to humans. "We found that while exposure to infectious agents or contaminants on their own might not have large effects on wildlife populations, the combination of the two can be greater than the sum of the parts," said senior author Richard Hall of the Odum School and College of Veterinary Medicine. Read more: [t.uga.edu/6zm](https://t.uga.edu/6zm).

## UNUSUAL 2019-2020 FLU SEASON LINKED TO MORE TRANSMISSIBLE STRAIN

The 2019–2020 flu season in the U.S. was unusual, with cases picking up in August and hitting children particularly hard. It was also dominated early on by a Type B influenza virus instead of one of the much more common Type A viruses like H3N2. A 2021 study by postdoc Rebecca Borchering and Prof. Pej Rohani suggests that these dynamics were driven largely by a new, more transmissible strain encountering a population with very little existing immunity to it. That was in part because the previous year's flu season was almost entirely the result of Type A influenza viruses. "Our study suggests it's important to keep an eye on the evolution of influenza B to avoid a vaccine mismatch in the same way they do with H3N2," Rohani said. The research was supported by the National Institutes of Health through the Models of Infectious Disease Agent Study Project, award number R01GM123007. Read more: [t.uga.edu/6HC](https://t.uga.edu/6HC).

## LONG-LIVED BUTTERFLY PARASITES CAN'T TAKE THE HEAT

By Ethan Hackmeyer, AB '23. Debilitating parasite spores that infect monarch butterflies can persist for years at cool temperatures, but are knocked out by heat, according to a 2021 study led by Cecilia Sánchez, PhD '19. Researchers conducted an experiment exposing *Ophryocystis elektroscirrha* spores to temperatures corresponding to those experienced by monarch butterflies across their range. The parasites were highly infective at all temperatures for the first two weeks, but as time went on, warmer temperatures dramatically reduced parasite infectivity and spore load. "We were a little shocked by how badly the spores survived under warmer temperatures, especially given that monarchs inhabit some very hot places like Florida and central California," said Sánchez. Read more: [t.uga.edu/73p](https://t.uga.edu/73p).

## UGA TO ESTABLISH NATIONAL NIH-FUNDED CENTER TO FIGHT FLU

By Michael Terrazas. The National Institutes of Health has awarded UGA a contract to establish the Center for Influenza Disease and Emergence Research (CIDER). The contract will provide \$1 million in first-year funding and is expected to be supported by the National Institute of Allergy and Infectious Diseases (NIAID), part of NIH, for seven years and up to approximately \$92 million. Scientists in the multi-institutional center will work to increase understanding of influenza virus emergence and infection in humans and animals while also making preparations to combat future outbreaks or pandemics. It will be directed by Prof. S. Mark Tompkins of the College of Veterinary Medicine, and its deputy director will be Prof. Pej Rohani. Read more: [t.uga.edu/73q](https://t.uga.edu/73q).

## SICKER LIVESTOCK MAY INCREASE CLIMATE WOES

By Talia Ogliore and Beth Gavrilles. Climate change is affecting the spread and severity of infectious diseases around the world—and infectious diseases may in turn be contributing to climate change. In a 2021 paper, Prof. Vanessa Ezenwa and colleagues described how parasites can cause animals to produce more methane, a powerful greenhouse gas. "There is evidence that climate change, and warming temperatures in particular, are impacting some infectious diseases, and increasing their prevalence," Ezenwa said. "If that's happening for livestock diseases, and simultaneously higher prevalence is triggering increased methane release, you could end up with what we call a vicious cycle." Read more: [t.uga.edu/60j](https://t.uga.edu/60j).

## NEW ALGORITHM SIGNALS A POSSIBLE DISEASE RESURGENCE

Scientists at UGA used machine learning to predict the reemergence of existing infectious diseases. Postdoc Toby Brett and Prof. Pej Rohani developed an algorithm that monitors case reports to look for statistical patterns associated with impending outbreaks and calculate the level of risk that a disease will reemerge. After training the algorithm on simulated case reports, they tested it on historical outbreaks of mumps and pertussis, which are directly transmitted, and malaria and dengue, which are vector-borne. "I think both Toby and I were astonished by how well the algorithm worked in these different systems with different transmission modes and resurgence that acts over very different timescales, ranging from weeks to many years" said Rohani. Read more: [t.uga.edu/73s](https://t.uga.edu/73s).

# RESEARCHERS IDENTIFY RULES FOR PREDICTING CLIMATE CHANGE EFFECTS ON HOST-PARASITE INTERACTIONS

BY ETHAN HACKMEYER, AB '23

Accelerating climate change and human activity leads to new host-parasite interactions as rising temperatures and habitat loss push species beyond their native ranges. And as parasites interact with these novel host species, the risk of disease outbreaks increases, threatening global health and economic futures.

New research from the University of Georgia, published in *Proceedings of the Royal Society B*, identifies rules to help predict how these host-parasite relationships will be shaped by global change.

In a study exploring the nature of parasite acquisition, ecologists Annakate M. Schatz and Andrew W. Park pinpointed the traits in both host and parasite communities that are likely to be the strongest predictors of parasite acquisition.

"Previous research in this area has often analyzed parasite sharing in general or it's been limited to case studies of relatively small geographic and taxonomic scales," said Schatz, a Ph.D. student in the Odum School of Ecology and the paper's lead author.

"Here, we consider multiple mammal species to get at broad rules. And by focusing on non-native hosts, we're able to examine specific dynamics of parasite acquisition—that is, new associations formed in the non-native range," Schatz said. "This has important implications for understanding parasite spillback, because the invasive species has to acquire a new parasite before it can influence transmission dynamics in other hosts."

Schatz and senior author Park, an associate professor in the Odum School and the College of Veterinary Medicine department of infectious diseases, developed models to predict parasite acquisition, based on traits of both host and parasite communities outside their native ranges.

To conduct their analysis, they used the Global Mammal Parasite Database, pulling data from over 2,700

publications about the host-parasite relationships in wild carnivores, ungulates, and primate hosts.

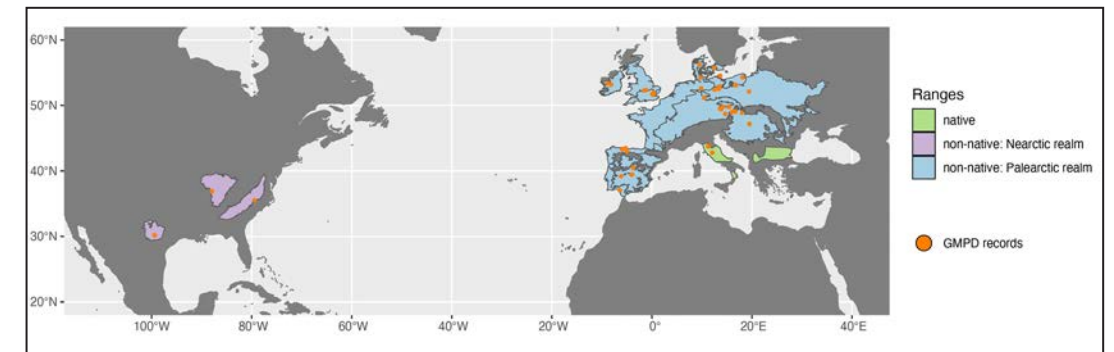
Their results span eleven host and 775 parasite species across three zoogeographic realms. They found that parasite prevalence, host phylogenetic compatibility, and the number of hosts per parasite serve as strong predictors of parasite acquisition.

Further, they found that parasite taxonomy interacts with these predictors, suggesting that parasite and host community traits cannot easily be disentangled.

To better understand parasite acquisition, they encouraged researchers to consider host-parasite community context.

"We also found some interesting patterns about parasite specialism and generalism," said Schatz. "For example, we saw that certain bacteria were acquired despite higher phylogenetic distances between the invading host and the original host; we think this is because they tend to be more generalist than other parasite types. We also saw that parasite specificity interacted with phylogenetic relatedness between hosts. So basically, when hosts are more closely related, they're more likely to acquire specialist parasites, but when they're more distantly related, they'll acquire generalists."

Schatz and Park said that while the data they have generated contributes to knowledge on



novel host-parasite communities, there is still more work to be done. Further studies will be needed to explore trends found by the models.

"Overall, our work shows that parasite acquisition is non-random and predictable. Importantly, our framework shows promise to be extended to other hosts, locations, and contexts not yet studied, so we hope this will be a starting point for further investigations of parasite acquisition," said Schatz.

Support for the study, "Host and parasite traits predict cross-species parasite acquisition by introduced mammals," was provided by the National Science Foundation. It is available online at [doi.org/10.1098/rspb.2021.0341](https://doi.org/10.1098/rspb.2021.0341).

\* ANDREW PARK PHOTO BY DOT PAUL



# U.S. ARMY CORPS OF ENGINEERS, UGA FORM NETWORK FOR ENGINEERING WITH NATURE

BY SARAH BUCKLEITNER

## Network for Engineering with Nature to promote natural infrastructure

The U.S. Army Corps of Engineers and the University of Georgia recently announced a partnership that connects the interdisciplinary expertise of UGA's Institute for Resilient Infrastructure Systems with the vast on-the-ground experience of USACE's Engineering With Nature® (EWN®) Initiative to form the Network for Engineering With Nature.

Through this partnership and a new \$2.5 million award to UGA from USACE, researchers are expanding and accelerating EWN and the practice of natural infrastructure in the public and private sectors.

EWN is an initiative developed by USACE to efficiently and sustainably deliver economic, environmental and social benefits through the use of natural infrastructure. By using a combination of natural and conventional processes and materials, natural infrastructure can protect people, homes, and habitats. It can come in many forms and scales, including sand dunes engineered to prevent erosion, floodplains along rivers, which allow the river to ebb and flow without flood risk to communities, and coastal wetlands, which filter out pollution and provide habitat.

Odum School faculty members Amy Rosemond and Seth Wenger are among sixteen UGA researchers from 10 different colleges and departments who will apply their expertise to N-EWN's mission. The project leader for UGA is principal investigator Brian Bledsoe, UGA Athletic Association Professor in Resilient Infrastructure in the College of Engineering.

The N-EWN partnership will also draw from the expertise of the UGA's River Basin Center and Center for Integrative Conservation Research. In addition, an equal number of researchers from USACE will add their knowledge and skill to the network, led by Dr. Todd

Bridges, the EWN National Lead and Dr. Jeffrey King, EWN Deputy National Lead.

"We are delighted to be working closely with USACE's world class researchers. Together, we can take our research on natural infrastructure to the next level and inspire a new generation of engineers and scientists who will reshape the nation's water resources infrastructure," Bledsoe said of the partnership.

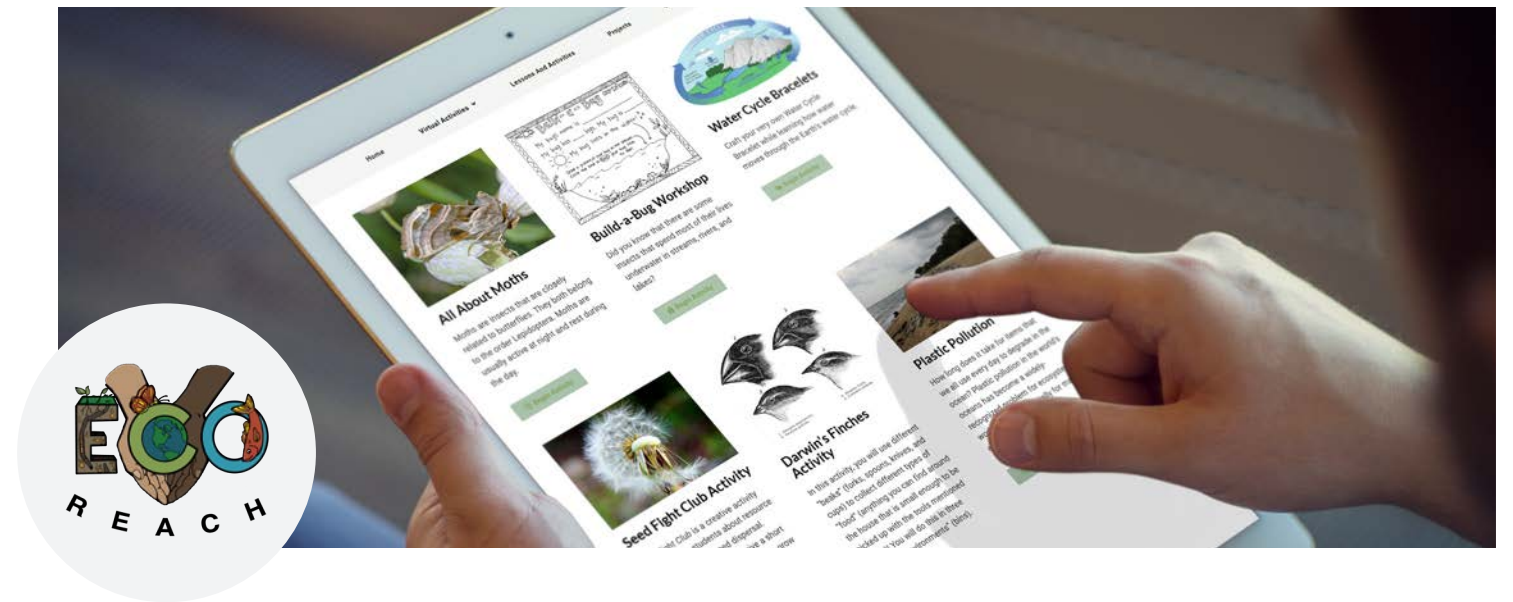
In an ambitious set of pilot projects, the researchers



PHOTO BY N-EWN

will improve methods for using natural infrastructure to strengthen community resilience, create models and dashboards that allow designers to map out how natural infrastructure can provide more benefits to society, and inspire a new generation of engineers, ecologists and social scientists to utilize natural infrastructure through education and workforce development.

Find more at [n-ewn.org](http://n-ewn.org) and by following the hashtag #N-EWN on Twitter and Instagram.



## ECOREACH CREATES VIRTUAL SCIENCE LESSONS FOR KIDS

For many K-12 students, hands-on activities are an important tool for learning about science. When schools closed in the spring of 2020 due to the COVID-19 pandemic, students no longer had access to labs or other facilities for experiential learning. To fill that gap, University of Georgia student organization EcoReach created a suite of online hands-on science activities that students could do from home.

"EcoReach officers and members have been hard at work developing online environmental education resources for teachers and caregivers working with K-12 students during the COVID-19 shelter-in-place," said Carolyn Cummins, a doctoral student in the Odum School of Ecology and the organization's co-president at the time. "We've turned several of our classroom activities into an at-home format and uploaded them to our website for anyone to use."

EcoReach, housed in the Odum School of Ecology, connects graduate, undergraduate, and professional ecologists at the University of Georgia with school-age children in the Athens area. Their goal is to raise awareness about the science of ecology and environmental issues while supplementing local schools' courses to meet objectives in the state curriculum guidelines.

Typically, EcoReach works with teachers to provide flexible programs designed to meet the needs of their students. They also provide informal educational opportunities, such as presenting programs to local Scout groups, serving as judges for science fairs, and holding programs at local science days.

With those kinds of in-person opportunities no longer possible, EcoReach members realized they could adapt

their approach to an online-learning format.

Virtual EcoReach activities include "Seed Fight Club," geared for elementary to middle school students to learn about resource competition and seed dispersal, and "Plastic Pollution," for elementary students to learn about how long it takes plastic to break down in the ocean, as well as activities about the water cycle, freshwater invertebrates, and moths.

"In addition to our online resources, we are also available for virtual meetings and lessons with K-12 students," said Kaylee Arnold, a doctoral student in the Interdisciplinary Disease Ecology Across Scales program and at the time an EcoReach co-president. "We've already teamed up with a few middle school classes to discuss how sheltering-in-place is impacting our environment."

Arnold said that one of EcoReach's goals has been to bring scientists from diverse backgrounds into classrooms.

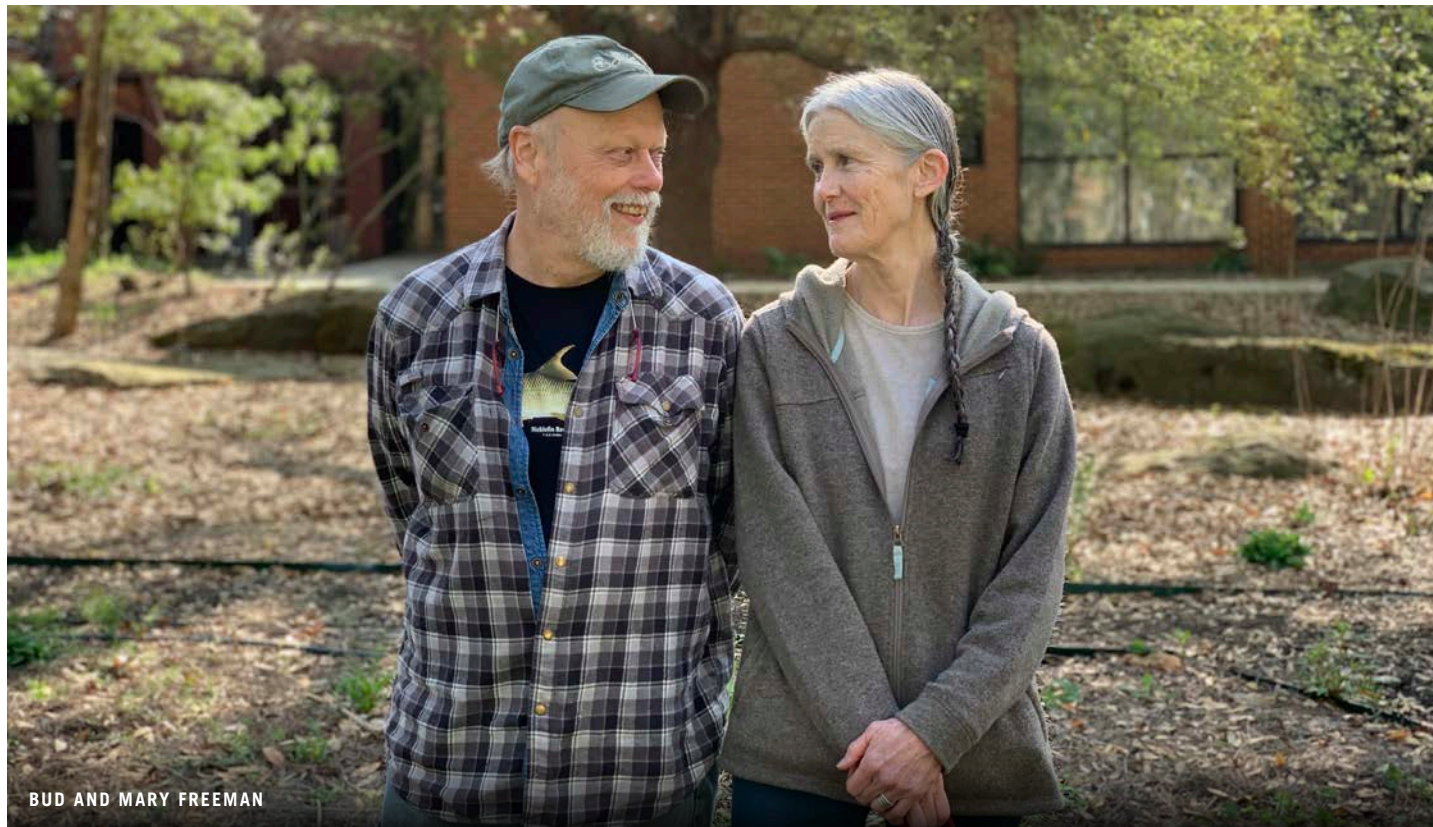
"It's important for kids to know that scientists are real people that can also look like them," said Arnold. "With this move to virtual learning, we hope to keep connecting with the schools and introducing students to our many different scientists."

EcoReach members also compiled a list of online environmental education resources, which they are continuing to expand.

"We would love to invite anyone to contribute additional resources to the resource list and to encourage folks to disseminate all of our resources as they see fit," said Cummins.

To learn more about this and other EcoReach activities, visit [ecoreach.ecology.uga.edu](http://ecoreach.ecology.uga.edu).





BUD AND MARY FREEMAN

## NEWLY DESCRIBED FISH SPECIES NAMED IN HONOR OF BUD AND MARY FREEMAN

BY IRENE WRIGHT, AB '21

University of Georgia ecologists Mary and Byron “Bud” Freeman are being recognized for their contributions to freshwater science in the most fitting way possible—with the naming of a newly discovered fish species in their honor.

The Etowah Bridled Darter (*Percina freemanorum*) was identified by Thomas Near, an ichthyologist and evolutionary biologist at Yale University. Near and his colleagues examined nearly two hundred specimens of darters collected from the Etowah River system in North Georgia. Based on DNA sequencing and notable differences in physical form, he determined that what had long been thought a population of the bridled darter *Percina kusha* was in fact a different species altogether.

*Percina freemanorum*—the suffix “-orum” is a designation used in taxonomic naming to honor a group or pair—is described in a paper published April 2, 2021 in the *Bulletin of the Peabody Museum of Natural History*.

Near cited the Freemans’ influence on freshwater science—and scientists—as his motivation for naming the new species in their honor.

“The citizens of Georgia have a wonderful Etowah River watershed, and any limits to impacts from human activity are in a large part due to the efforts of Mary and Bud Freeman,” Near said. “From the very start of my career, both Mary and Bud were always encouraging, freely open with their observations and data, and helped set a tone of collegiality among the large community of scientists studying the species-rich North American aquatic biodiversity.”

“[The Freemans] have helped revitalize a pride for people in terms of what the diversity of the Southeast is about,” said John Wares, a professor of genetics and ecology and curator of genomics and aquatic invertebrates at the Georgia Museum of Natural History. “They are a really unique resource for us here at the University of

Georgia, and I think their impact has been huge across the Southeast and beyond.”

The Freemans have done groundbreaking research about freshwater species and ecosystems for decades, with hundreds of publications to their names. Much of their work has been done in the Etowah River system, bringing attention to the region’s status as a hotspot of aquatic biodiversity. Their findings have informed efforts to protect species diversity throughout the Southeast and beyond: Many of the freshwater species in the area, including *Percina freemanorum*, are found nowhere else in the world and are considered imperiled.

Bud Freeman, PhD ’80, a senior public service associate in the Odum School and director of the Georgia Museum of Natural History, has focused his research in large part on the distribution and abundance of southeastern fishes. Mary Freeman, a research ecologist with the U.S. Geological Survey and an adjunct faculty member in the Odum School, works to understand how human activities affect the characteristics of streams and rivers and, in turn, the persistence of the species that live in them. This combination has made them a powerful team.

“Between the two of them, they have made important contributions to our understanding of the genetics, the systematics—meaning what species are assigned to different groups—and to our understanding of the ecology and natural history of native fishes and freshwater organisms,” said Assoc. Prof. Seth Wenger, PhD ’06, director of science at the UGA River Basin Center, who has

worked with the Freemans for many years. “They also have complementary strengths, although they both share a love of the fish themselves, and the ecosystems...an excitement and an appreciation for the natural history.”

The Freemans have also had a major influence through their teaching and mentoring. “For many of us who have



**PERCINA FREEMANORUM. BOTH SPECIMENS COLLECTED FROM AMICALOLA CREEK, DAWSON COUNTY, GEORGIA. (PHOTOGRAPHS BY GEORGIA DEPARTMENT OF NATURAL RESOURCES)**

come to work on these issues and with these critters over the last few decades, the Freemans have served as wonderful role models, mentors, and inspirations. Lately they’ve been getting more recognition, which many of us feel is long overdue, given the dedication that they have had,” said Wenger, noting that Mary Freeman was recently named a Fellow of the Society for Freshwater Science and the recipient of that organization’s Environmental Stewardship Award.

“They have a phenomenal power to open up new ways of thinking about ecology and freshwater ecosystems,” Wares said. “Their ability to deeply immerse the people around them in thinking about natural history and its relevance to why species are disappearing, or thriving, is really why I got into biology.”

The Freemans’ passion for ecology, for learning, for nature has not waned over a career of more than 40 years, and they are both eager to get back to work on some larger projects that have been on hold for the past year.

“That’s what we do. This has been our lives. We complement each other in our interests and our skills,” said Bud Freeman. He called the naming an “enormous honor.”

“I think you have to believe that you can make a difference, or we can make a difference, and be able to envision a future where streams are clear,” said Mary Freeman of the future of their work, “We’ve got to move forward, we can’t go back.”

The paper by Near et al., “A New Species of Bridled Darter Endemic to the Etowah River System in Georgia (Percidae: Etheostominae: *Percina*),” is available online at [doi.org/10.3374/014.062.0102](https://doi.org/10.3374/014.062.0102).



**THE HABITAT OF THE NEWLY DISCOVERED FISH IN AMICALOLA CREEK, DAWSON COUNTY, GEORGIA. (PHOTOGRAPHS BY GEORGIA DEPARTMENT OF NATURAL RESOURCES)**



## 2020 AWARDS &amp; HONORS 2021



Prof. **SONIA ALTIZER** was named a Fellow of the American Association for the Advancement of Science (AAAS) in 2020.



Doctoral candidate **DENZELL CROSS** received an Endowment Fellowship and was selected to participate in the Emerge Fellowship program, both from the Society for Freshwater Science in 2021.



Doctoral student **EMILY BERTUCCI** was the inaugural recipient of the new Dr. Rebecca Reyburn Sharitz and Carl Byrne Hatfield Fellowship, which was established in 2020 by a generous gift from the family of the late Prof. Emerita Becky Sharitz to support graduate students in ecology or plant biology working at the Savannah River Ecology Laboratory. Doctoral student **SAMANTHA BOCK** was named the award's second recipient in 2021.



Doctoral student **CAITLIN CONN** received a UGA Graduate School Dissertation Completion Award in 2021.



Undergraduate Ecology major **EMMA BAY DICKINSON**, BS '21, won the UGA Libraries Undergraduate Research Award, 1st-3rd Year Division, for her presentation "Landscape and Local Determinants of Non-breeding Bird-Use in Powerlines" at the 2020 UGA CURO Symposium.

Incoming master's student **FABIOLA LOPEZ AVILA** was selected to participate in the Emerge Fellowship program of the Society for Freshwater Science in 2021.



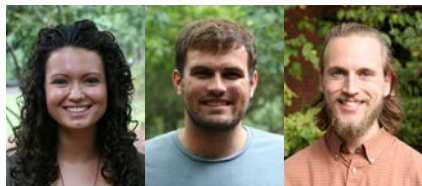
Asst. Prof. **KRISTA CAPPS** was awarded a CAREER grant from the National Science Foundation Faculty Early Career Development program.



Doctoral student **CAROLYN CUMMINS** received first place in the Graduate Student – Applied Sciences category for her virtual poster, "Thermal responses in growth, survival, and development of the stream shredder Tallaperla: Implications for carbon processing under climate change," at the Society for Freshwater Science annual conference in 2020.



Professors **JOHN DRAKE** (2020) and **PEJMAN ROHANI** (2021) were named Fellows of the Ecological Society of America.



Master's student **DESSA DUNN** and doctoral students **JEFF BEAUVAIS** and **NATE TOMCZYK**, MS '17, received Outstanding Teaching Assistant Awards administered by UGA's Center for Teaching and Learning in 2021 in recognition of their dedication to undergraduate education and the integrity they bring to our teaching program.



Undergraduate ecology major **JARED BENNETT** received the 2021 UGA Presidential Award of Excellence, given to students representing the top 1% of undergraduates at UGA who excel in academics, service, and leadership.



Postdoctoral associate **TOBY BRETT** received the 2021 UGA Postdoctoral Research Award from the UGA Office of Research.



Master's student **KYLE CONNELLY** received an Endowment Fellowship from the Society for Freshwater Science and a Presidential Management Fellowship from the U.S. Office of Personnel Management in 2021.



Undergraduate **ELIZABETH ESSER**, who is pursuing a dual degree in ecology and genetics, was one of two UGA students named a 2021 Udall Scholar. A Foundation Fellow and Honors student, she plans to pursue a career in conservation and environmental protection, with a particular interest in applying genetic techniques to help endangered species and mitigate the effects of invasive species.



Prof. **WILLIAM FITT** received a Fulbright Fellowship to research the role of climate change/global warming in the spread of the jellyfish *Cassiopea* to Brazil.



Professors **VANESSA EZENWA** and **GENE RHODES** were named Georgia Athletic Association Professors in 2020.



Doctoral students **ANECIA GENTLES** (2020), **ADAM MCFALL** (2020), **LAURA KOJIMA** (2021), and **DANIEL SUH** (2021) received Graduate Research Fellowships from the National Science Foundation.



Postdoctoral associate **CECILIA SÁNCHEZ**, PhD '19, received the Robert C. Anderson Memorial Award from the UGA Office of Research in 2021, given for outstanding research at the university or immediately after graduating.



Doctoral student **KELSEY SOLOMON** was inducted into the Blue Key National Honor Society in 2021.



Doctoral student **DANIEL SUH** won Best Student Poster award at the 2020 virtual meeting of the Ecological Society of America for his poster "Exploring the differential competence of communities by observing ranavirus in larval amphibian communities."



Adjunct faculty member **MARY FREEMAN** was named a Fellow of the Society for Freshwater Science and received the organization's Environmental Stewardship Award in 2021.



Undergraduate Ecology major **CULZEAN KENNEDY**, BS '21, won the award for Best Paper in the Life Sciences for "Enhancing malaria vaccine immunogenicity and stability using VacSIM delivery method" at the 2020 UGA CURO Symposium.



Master's student **JESSIE MOTES**, BS '19, won the 2020 Best Student Presentation Award sponsored by the Ecological Society of America Biogeosciences Section and the New Phytologist for her talk "Nitrogen inputs and losses following disturbance: A slippery slope" at the 2020 Ecological Society of America Annual Meeting.



Doctoral student **CLAIRE TEITELBAUM** was awarded the 2020 James L. Carmon Honorarium from the UGA Office of Research for innovative use of computers in advancing research as a graduate student at UGA. She also received the award best student presentation at the North American Congress for Conservation Biology 2020 virtual conference for her poster "Local and Behavioral Adaptations to Temperature in a Trailing Edge Population," and in 2021 received the Stoddard-Burleigh-Sutton Award from the UGA Warnell School of Forestry and Natural Resources.



Doctoral student **RENI KAUL** received a dissertation completion award from the UGA Graduate School and a 2020 Graduate School Excellence in Teaching Award in honor of ongoing commitment to developing innovative teaching strategies to enhance student learning.



**ANIA MAJEWSKA**, PhD '19, received the 2020 Robert C. Anderson Memorial Award from the UGA Office of Research in recognition of significant academic and research accomplishments.



Postdoctoral associate **MAURICIO SEGUEL** received the 2020 Robert C. Anderson Memorial Award, given by the UGA Office of Research in recognition of significant academic and research accomplishments at UGA.



Undergraduate ecology major **SYDNEY SPEIR** won the UGA Libraries Undergraduate Research Award, 1st-3rd year division, for her research on "Expansion of Known Ringtail (*Bassariscus Astutus*) Diet within Zion National Park" at the 2021 UGA CURO Symposium.

## 2020 AWARDS &amp; HONORS 2021



# 2021 GSS AWARD WINNERS

## PEOPLE'S CHOICE AWARD Doreen Chaussadas

### SESSION AWARDS

#### SESSION 1

#### Claire Teitelbaum

Urbanization and habitat specialization interact to drive infection outcomes for mobile wildlife

#### SESSION 2

#### Robbie Richards

The macro-ecology of predator-prey-parasite interactions

#### SESSION 3

#### Doreen Chaussadas

Impacts of bio-loggers' weight on their carrier: Is 5% of the body mass an acceptable charge to put on a bird's back?

#### SESSION 4

#### Kate Sabey

Antibiotic treatment alters gut microbiota plasticity in a wild mammal

#### RAPID FIRE 1

#### Carolyn Cummins

Where will carbon go when it enters warmer streams? A test of temperature effects on shredder physiology

#### RAPID FIRE 2

#### Emily Bertucci

Intrinsic and extrinsic factors interact during development to influence telomere dynamics in a long-lived apex predator

## UNDERGRADUATE POSTER AWARDS

#### 1ST PLACE

#### Niki Gajjar

Morphological root traits and phylogenetic signals in Southern Africa trees and grasses

#### 2ND PLACE

#### Christopher Brandon

Walking while parasitized: Effects of a nematode parasite on locomotion activity of horned passalus beetles

#### 3RD PLACE

#### Amelia Foley

Plastic in the urban environment: An exploratory study of microplastics in the Athens, GA community

## GRADUATE STUDENT SYMPOSIUM 2021

The 27th annual Odum School of Ecology Graduate Student Symposium took place online from Feb. 5–6, 2021. This year's keynote speaker was Ethell Vereen, PhD '10, an assistant professor of biology at Morehouse College.

As in years past, GSS 2021 was organized and run by Odum graduate students and featured talks by graduate students in ecology, conservation ecology and sustainable development, integrative conservation, and the IDEAS doctoral program, as well as undergraduate research posters.

While organizing the two-day GSS has always required an enormous amount of preparation and planning, the 2021 edition presented the additional challenge of converting an in-person conference into a virtual format. Coordinators Jeff Beauvais and Nate Tomczyk, with the help of the entire program committee, Odum staff, and all the participants, rose to the occasion, pulling off an event that went without a hitch. Presenters pre-recorded their talks, which were streamed and followed by live question and answer periods over Zoom. The undergraduate poster session was conducted via breakout rooms, making the experience as much like the traditional GSS as possible.

Keynote speaker Ethell Vereen received both a master's degree in environmental health and a doctorate in ecology at UGA, where his research focused on investigating the presence of the pathogens Salmonella and Campylobacter in the stream network of the Satilla River Basin. He completed postdoctoral training in the Fellowship in Research and Science Teaching (FIRST) Institutional Research and Academic Career

Development Award Program at Emory University, which combined mentorship in research and teaching. In his current faculty position at Morehouse College, Vereen focuses on diversity and inclusion in natural resources while continuing his research in environmental health, water quality, and environmental microbiology.

Vereen's talk, "Life in Flowing Water," addressed his interests in research and teaching, covering contemporary issues and challenges of urban watersheds and life lessons he's learned as a researcher fascinated by flowing water, rivers and streams.



As has become traditional, GSS coincided with the annual John K. Spencer Memorial 5K Run and Walk, which was held virtually from Feb. 1–7. It drew more than 60 participants from across the country and raised over \$700 for the River Basin Center's John Spencer Research Grant Program. This event honors the memory of the late John Spencer, MS '16, a graduate student in the Odum School and River Basin Center who was an extraordinary individual loved for his humor, generosity, enthusiasm and kindness. John studied urban streams and was passionate about freshwater ecology, conservation and ecological restoration. Contributions to the fund may be made at [t.uga.edu/76x](http://t.uga.edu/76x); put "JKS Small Grants" in the comments.

## FELLOWSHIP HONORS LATE PROF. EMERITA REBECCA SHARITZ

Trailblazing ecologist Rebecca R. Sharitz spent almost her entire career at the University of Georgia Savannah River Ecology Laboratory. A world-renowned expert on wetlands with more than 160 peer-reviewed publications to her credit, she was also revered as a teacher and mentor to graduate students, postdoctoral researchers, and volunteers.

Sharitz's husband, Carl Byrne Hatfield, was a computer systems analyst at the U.S. Department of Energy's Savannah River Site, within which the Savannah River Ecology Laboratory is located. Over the course of their 42-year marriage, he was an enthusiastic supporter of his wife's work.

Now, a generous gift from their family has established a fellowship in their memory to ensure that their legacy continues. The Dr. Rebecca Reyburn Sharitz and Carl Byrne Hatfield Fellowship Fund will provide support for doctoral candidates in ecology or plant biology at the University of Georgia, particularly those affiliated with the Savannah River Ecology Laboratory.

"Becky Sharitz was not only a brilliant researcher, but a gifted teacher and a role model for many young scientists," said John L. Gittleman, UGA Foundation Professor and dean of the Odum School of Ecology. "This fellowship is a truly meaningful tribute."

Sharitz was born and raised in Wytheville, Virginia. She came to the Savannah River Ecology Laboratory as a research associate in 1972, two years after receiving her doctorate in botany from the University of North Carolina at Chapel Hill. She spent the next 38 years conducting groundbreaking research on southeastern wetlands and educating dozens of students. At the time of her death in 2018, she was Professor Emerita in the department of plant biology, adjunct professor in the Odum School of Ecology, and senior research ecologist at the Savannah River Ecology Laboratory.

Much of Sharitz's research focused on the ecosystems

of swamp and bottomland forests, as well as their conservation and restoration. She was especially known for her work on isolated wetlands and southeastern U.S. floodplains, and was considered one of the world's leading experts on Carolina bays, oval-shaped depressions that are found throughout the coastal plain.

Among her many honors, Sharitz was recognized by the Environmental Law Institute, which presented her with its National Wetlands Award in Science Research in 2010. She was a Fellow of the Society of Wetland Scientists and the Ecological Society of America, for which she served as national vice president. She also served as president of the Association of Southeastern Biologists and vice president and member of the executive board of the International Association for Ecology (INTECOL).



(ABOVE) REBECCA SHARITZ IN HER ELEMENT IN THE WETLANDS. SUBMITTED PHOTO. (TOP LEFT) REBECCA SHARITZ EXAMINES CATTAILS IN A WETLAND AREA AT THE SAVANNAH RIVER ECOLOGY LABORATORY IN 1978. (BOTTOM LEFT) INSTITUTE OF ECOLOGY.

The inaugural Sharitz-Hatfield Fellow was Emily Bertucci, a doctoral student in ecology who conducts research at SREL on the effects of environmental stressors on biological aging.

"Emily is a gifted researcher who is already publishing and receiving recognition for her work on ecological physiology and how the environment influences it," said Gittleman. "It is especially gratifying that Emily, like Becky Sharitz, is committed to educating the next generation and has served as a teaching assistant in ecology and a volunteer educator at SREL. We are enormously grateful to the Sharitz-Hatfield family for creating this fellowship to support outstanding students like Emily, now and into the future."

To support the Sharitz-Hatfield Fellowship Fund, visit [www.ecology.uga.edu/give/](http://www.ecology.uga.edu/give/).



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# SPRING FLING AWARDS

The Odum School of Ecology recognized the achievements of students, faculty, postdoctoral associates, and staff at the 2021 Spring Fling awards celebration on April 23. This year’s theme was “Odum Gone Viral.” Although this year’s event took place over Zoom, hosts Prof. Amy Rosemond, Undergraduate Lab Coordinator Kait Farrell, PhD ’17, and special guest John Kominoski, PhD ’08, set the stage for a celebratory (and hilarious) evening aboard the “S.S. Odum.” Doctoral student Dan Cryan won the costume contest for his beatnik-inspired look, triumphing over the likes of Zsa Zsa Gassyflux, Sippy Lysimeter, and Captain Salty/DJ Secchi Disco.



## ODUM SCHOOL OF ECOLOGY AWARDS

GEORGIA POWER HORSESHOE BEND  
STUDENT RESEARCH AWARD

**Elizabeth Johnson**  
**Doreen Chaussadas**

JOSH LAERM MEMORIAL OUTSTANDING  
ECOLOGY UNDERGRADUATE AWARD

**Liz Jurado**

THELMA RICHARDSON AND FRANK GOLLEY  
UNDERGRADUATE SUPPORT AWARD

**Christopher Brandon**  
**Jillian Wilson**

BEST STUDENT PAPER AWARD

**Annakate Schatz**  
“Host and parasite traits predict  
cross-species parasite acquisition  
by introduced mammals”  
*Proceedings of the Royal Society B*

DISTINGUISHED GRADUATE  
STUDENT TEACHING AWARD

**Dessa Dunn**  
**Nate Tomczyk**  
**Carol Yang**

FRANK GOLLEY MEMORIAL AWARD

**Caitlin Conn**

GRADUATE DIVERSITY AWARD IN ECOLOGY

**Laura Kojima**  
**Akanksha Sharma**

DR. REBECCA REYBURN SHARITZ AND  
CARL BYRNE HATFIELD FELLOWSHIP

**Samantha Bock**

ROBERT A. SHELDON AWARD

**Andrew Nagy**



ODUM SMALL GRANTS

**Supraja Rajagopal**  
**Izzy Ragonese**  
**Kelly Ridenhour**  
**Megan Tomamichel**

EMPLOYEE OF THE YEAR AWARD

**Tyler Ingram**  
**Brian Perkins**  
**Leslie Sitz**

OUTSTANDING FACULTY  
INSTRUCTORS OF THE YEAR

**Kait Farrell**  
**Amy Rosemond**

DEAN’S AWARD

**Kait Farrell**  
**Alli Injaian**  
**Amanda Rugenski**

KEYSTONE STAFF AWARD  
(FORMERLY THE PURPLE HEART AWARD)

**Patrick Kelley**  
**Jennifer Yearby**

## WELCOMES AND FAREWELLS

In addition to the presentation of awards, attendees welcomed colleagues who joined the Odum School during the past year, including faculty members **ALEX STRAUSS** and **ALLI INJAIAN**, staff members **KATE GALBRAITH**, **JOHN KING**, **LAURA LEACHMAN**, **JENNIFER MATHEWS**, **SUZANNE O'REGAN**, **BREANNA ONDICH**, **PAUL SNYDER**, and **EMMA SPIEGEL**, and postdoctoral associates **KYLE DAHLIN**, **JASON DONALDSON**, **KANIZ FATEMA NIPA**, **MEKALA SUNDARAM**, and **CHARLES VAN REES**.

Participants also paid tribute to three recent retirees, **TERRY CAMP**, **ALAN COVICH**, and **LAURIE FOWLER**.

Professors Emeriti Alan Covich and Jim Porter made remarks honoring Odum Librarian **TERRY CAMP**, who retired in 2020, for her herculean efforts to ensure that the legacies of Eugene Odum and Frank Golley were preserved in the UGA Special Collections Libraries, which included coordinating the transfer of hundreds of boxes of papers and other memorabilia. She also played a pivotal role in helping Prof. Emeritus Dave Coleman with his book *Big Ecology*, helped organize the archives of the Ecological Society of America at UGA, and assisted faculty, staff, and students with research for projects large and small. With her unassuming, compassionate nature and sense of humor, she has played an essential role in fostering a sense of community within the Odum School.

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# RETIREMENTS

**Alan Covich**, Professor Emeritus

Alan Covich served as Director of the Institute of Ecology from 2003-2006, prior to the creation of the Odum School of Ecology. His enthusiasm and dedication to teaching and the field of aquatic and ecosystem ecology is something that we have all benefited from and it is hard to imagine him retiring! Indeed, he is not leaving the halls of Odum yet, and he will still be active in an emeritus status, retaining his office in the Ecology Building over the next year.

He remains actively involved in research at the NSF-funded Luquillo Long-Term-Ecological Research Program which focuses on the effects of the increased incidence of extreme climate events on tropical stream ecosystems in Puerto Rico. His contributions to this project continue to be invaluable. He is also synthesizing his research on stream and decapod ecology in the Brazilian Pantanal which is supported by a Fulbright Award.

Alan has been a great colleague to us in the Odum School and a teacher and mentor to so many students in Odum and beyond! His contributions to freshwater science are vast and

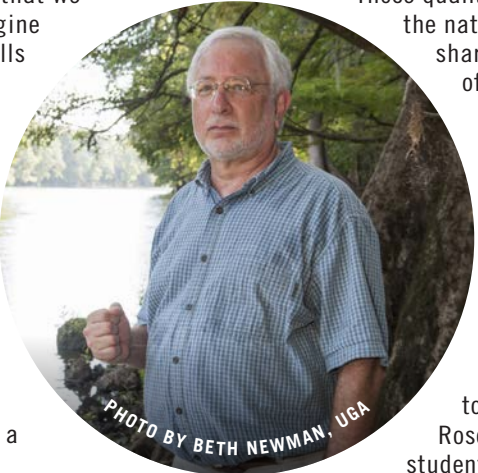


PHOTO BY BETH NEWMAN, UGA

deep, and he maintains a strong relationship with ESA, where he is a past president and Fellow. He has led with and emulated the qualities that have built the foundation of the Odum School.

Those qualities are his wonder and enthusiasm for the natural world and his care for students. He shares his awe of the organisms and functions of freshwater ecosystems with students, stimulating their interest in the material and helping them to see the needs for conservation and restoration of streams and lakes.

He is kind and generous with his time. Alan has been a role model to many of us in showing us it’s not what you do that matters, but how you do it. In these times when there is more and more to do, Alan has a gift for making time and space to talk to people and not be rushed. With Amy Rosemond, he took the Freshwater Ecosystems students to Cali-n-Tito’s for a get-together. He was in his element, telling lots of stories and just enjoying being part of a learning community.

- Mary Freeman, Catherine Pringle, and Amy Rosemond

**Laurie Fowler**, Senior Public Service Associate Emerita

Laurie Fowler retired in May 2020 from her joint position with the Odum School of Ecology and the School of Law. As the Director of Policy for the River Basin Center for the last 15 years, Laurie established the RBC as an international hub for applied water research and policy development. She held multiple positions within the Odum School, including Director for Public Service and External Affairs and Associate Dean for Administrative Affairs, and was instrumental in raising the profile of the school and attracting external donations. Over the course of her career she has been honored with at least two dozen awards from a range of nongovernmental organizations, government agencies, and the university.

Laurie taught the popular Environmental Practicum course, a class in which students worked in interdisciplinary groups to tackle real-world management and policy problems brought by external partners. It’s a class that many students have described as transformative. In fact she is still teaching that course as of May 2021, despite her retirement,



PHOTO BY DOT PAUL, UGA

along with a brand new course in climate change policy. Perhaps Laurie’s greatest contribution for many of us is how she expanded the idea of what was possible for her students and her colleagues. Her response to a challenge was “well, why not?” and “let’s figure it out.” She inspired the people around her to try more and to accomplish more. No obstacle was too big to try to overcome if the goal was worthy.

And finally, Laurie led by example in demonstrating that being a productive academic doesn’t have to come at the expense of being a good person. If there was a birthday, she would bring the cake. When things went wrong, Laurie would do what needed to be done to quietly fix it. When someone was in need, Laurie was there to help. We’ll miss having Laurie around, but we’re happy that she’s still staying engaged and that she’s taking more time to be with her family and to do all the other things that she loves.

- Seth Wenger



## MEET OUR NEWEST FACULTY

**K**ait Farrell, PhD '17, joined the Odum School faculty as the undergraduate lab coordinator in June 2019 after two years as a postdoctoral researcher at Virginia Tech. There Farrell, whose dissertation explored drivers of ecosystem functions in headwater stream networks, conducted lake modeling research. A large component of her duties, however, focused on developing teaching modules to bring macrosystems ecology concepts into undergraduate classrooms, an effort known as Macrosystems EDDIE (Environmental Data-Driven Inquiry and Exploration.)

"That was where I realized how much I enjoyed making ecology curriculum and teaching tools, and in a lot of ways led to me being here now," Farrell said.

When she was offered a teaching-focused position at Odum, it was an easy choice.

"For my postdoc I was in an ecology lab within a biological sciences department, so the opportunity to come back to somewhere where you're surrounded by other ecologists and immersed in ecological ideas was a really exciting option," she said.

In her role as the undergraduate lab coordinator, Farrell develops activities and prepares materials for Odum's two large-enrollment lab courses.

"Most of what I do as the undergrad lab coordinator is behind the scenes," she said.

Her duties also involve classroom teaching, including the senior seminar for ecology majors and an ecology-focused section of the required seminar for new graduate teaching assistants. Her favorite teaching role thus far, however, has been as an ecology instructor for UGA's Interdisciplinary Field Program, which takes students across the U.S. for an immersive semester on wheels each summer.

"I love it because all the students are taking ecology and



KAITLIN FARRELL, PHD '17,  
UNDERGRADUATE LAB COORDINATOR

geology and anthropology and we're in the field, steeped in all three disciplines at the same time," Farrell said. "It's just an amazing way to learn about natural systems and how they connect with everything else."

Of course, due to COVID-19, Farrell didn't have the chance to teach in the IFP in 2020, and the program was also cancelled for 2021. And that was not the only disruption caused by the pandemic. When UGA decided to switch to online-only instruction following the 2020 spring break, Farrell had to quickly redesign half a semester's worth of labs to virtual formats. Fall offered new challenges, requiring a hybrid of in-person and online opportunities.

Farrell's goals were to make sure the students were learning the core ideas and skills from the labs regardless of format, and to take some of the burden off teaching assistants who were also dealing with pandemic-related challenges in their own coursework and research.

But in spite of the obstacles posed by COVID-19, Farrell has been able to find some silver linings, including a renewed focus on collaboration and data skills that should serve the students well in their future endeavors in academia and beyond.

"Teaching during the pandemic has pushed me to rethink how we engage our students in ecology," she said. "So for example, we usually would have student teams go out to the Botanical Gardens, collect data about the forest or streams, and use that data to answer a research question. But because we couldn't go out into the field together, we instead said, 'OK, find and use public data sets online to answer your questions.' And students came up with creative and interesting questions that they never would have been able to explore if they were constrained to collecting their own data."

Farrell said that she intends to retain some of these new methods and learning outcomes even when fully in-person labs return—whenever that may be. "I'm looking forward to finding out what a 'normal' year might look like," she said.

me," she said. "A lot of smaller colleges that have more of a focus on teaching don't necessarily have ecology departments, they just have a biology department and maybe you'd be one of two, if not the only ecologist there. So this position is unique in that I am teaching focused but I still get to be part of a community that focuses on ecology and stay up to date on research."

Starting a new faculty position in the midst of the COVID-19 pandemic presented a number of challenges. For one thing, many faculty, staff, and students were working remotely when Injaian arrived on campus, meaning she was one of a very few people in the Ecology building.



ALLISON INJAIAN,  
LECTURER

**A**lli Injaian was completing a Rose Postdoctoral Fellowship at Cornell University in 2019, studying the effects of light pollution and noise pollution on birds, when she saw the job posting for a lecturer at the Odum School of Ecology.

"I thought that being at a bigger university where there is a designated ecology department and having a teaching focused position within that could be a really great fit for

## MEET OUR NEWEST FACULTY

"I don't know what it's like in normal times, but I definitely look forward to meeting more people, passing more people in the hallways and just getting to know folks better in the department," she said.

Injaian's first courses were two large lecture classes, both of which she taught in a hybrid format, with some students participating in person and some online. "There was a learning curve to that," she said. But despite the difficulties it presented, she found that the format also offered opportunities.

"Students have really taken to the Zoom chat, and I think that it allows for participation from students who wouldn't feel comfortable speaking up in a normal class," she said. "I don't know how to implement that once classes all go to in-person format once again. But I do recognize that perhaps having a less intimidating way of participating could engage a more diverse group of students."

Injaian said she was excited about expanding her teaching portfolio in the spring with Ecology 4900, the

environmental practicum, a service learning class for AB ecology majors.

"The students develop a project alongside community stakeholders and carry out that project, do a few different writing assignments associated with their project, and ultimately create some sort of outreach product," she said. "They have to communicate whatever project they did with both the stakeholders they worked with and the general public."

Besides her classroom duties, Injaian serves on the Ecology undergraduate program committee and advises BS majors who are interested in graduate school. She will be the Odum School's representative on the University Council starting this summer.

And while her position is centered on teaching, Injaian will continue to conduct research, but now with an emphasis on undergraduate pedagogy.

"I'm planning to collect data on my own teaching to better understand how I can make it more effective for student learning," she said.

**A**lex Strauss, who joined the Odum School faculty in fall 2020, describes himself as a community ecologist who takes a multi-pronged approach to understanding the roles of parasites and pathogens.

"I like doing field studies," he said. "I feel like the most important questions are ones that are grounded in nature. I also like to do experiments in the lab; experiments are really a scientist's best friend, the best way to test hypotheses. And I also like to use mathematical models. When there are complex feedbacks involved in ecological systems, often a model can help me understand what I'm seeing."

Strauss uses all these tools to explore two very different study systems: zooplankton and grasses.

"Zooplankton are sort of the bottom of the food web in lakes, in aquatic ecosystems," Strauss said. "They get infected by a wide variety of parasites that have important impacts on community structure and ecosystem functioning. They're also a great model system for studying population and community ecology and epidemiology and disease transmission."

Strauss also studies pathogens of grasses, in particular a fungus called *Epichloë* that infects tall fescue.

"It's an endophyte that lives inside the leaves, and it actually protects the plant from insect herbivores and other leaf pathogens, but it produces a toxin that causes symptoms in livestock that graze on it," he said. "So it's



ALEXANDER STRAUSS,  
ASSISTANT PROFESSOR

sort of an interesting interaction between host-microbe interactions in an ecosystem and community context with some implications for applications."

Strauss came to UGA from the University of Minnesota, where as a postdoctoral fellow he was part of a multidisciplinary collaboration with researchers in ecology, veterinary medicine, and natural resources studying chronic wasting disease in deer.

"It was a really neat opportunity to bring a bunch of experts from completely different disciplines together, and it seems like there's that same potential at UGA, with all these departments in applied sciences and the ecology school," he said. "I'm excited to learn how to best use UGA's resources to support my research program."

Along with his research, Strauss is co-teaching graduate courses, including classes in population and community ecology with Prof. Andrew Park and the population of infectious diseases with Prof. Sonia Altizer.

"These are the two courses that are probably most closely related to my areas of expertise, so it's fun for me to be able to teach topics that I'm passionate about," he said. "And it's also really fun for me to get to work with Andrew and Sonia, because they're leaders in my field."

Teaching and setting up his laboratory have been challenging given the restrictions in place in response to COVID-19, but Strauss is looking forward to the future in Athens.

"Everybody that I've been interacting with has been wonderful and very supportive," he said. "It's exciting because any sort of direction that I can imagine wanting to take my lab, there's an expert in that field who seems excited to collaborate and work with."



# LAWRENCE R. POMEROY

## JUNE 2, 1925 – MARCH 26, 2020

Lawrence R. Pomeroy, Alumni Foundation Professor Emeritus of Ecology at the University of Georgia, passed away peacefully on March 26, 2020, in Burlington, North Carolina. He was 94.

“Larry Pomeroy was one of the most influential ecologists of our time,” said John L. Gittleman, dean of the Odum School of Ecology and UGA Foundation Professor. “He changed the way we understand nutrient cycling, particularly through the concept of the microbial loop. His work had an impact beyond academia too, contributing to the protection given to Georgia’s coastal ecosystems. Despite his achievements, he was a sincerely modest, kind and generous person. He will be greatly missed by all who had the privilege of knowing him.”

Larry Pomeroy was born June 2, 1925, in Sayre, Penn., and grew up in Watkins Glen, New York, and Pass-a-Grille, Florida. His interest in the natural world and marine science began early. He wrote a nature column for the local newspaper while a high school student, and worked for a time as a commercial fisherman, gaining invaluable experience that would serve him well for the rest of his career. He received his bachelor’s and master’s degrees in zoology from the University of Michigan and a doctorate in marine science at Rutgers University in 1951, studying oysters with Prof. Hal Haskins. It was there that he developed his interest in biogeochemistry.

After doing postdoctoral work at the Oyster Research Lab—now the Haskin Shellfish Research Laboratory at Rutgers—he accepted a position at the newly established University of Georgia Marine Institute on Sapelo Island in 1954. Along with his wife Janet, he spent the next six years there, developing a research program from scratch.

His early work on Sapelo was based on studying the organisms and ecological processes of the island’s salt marshes and estuary as a system, a highly innovative concept at that time. This required not only scientific knowledge and curiosity but also practical skills. Besides his ability to handle boats, he was able to make do with the limited resources of this brand new and quite remote field station to create the scientific equipment he needed. After four years on Sapelo he became the Marine Institute’s acting director. By the time he left to join the zoology department on UGA’s main campus in Athens in 1960, he had helped build the program and facilities into a modern and highly productive research institute.

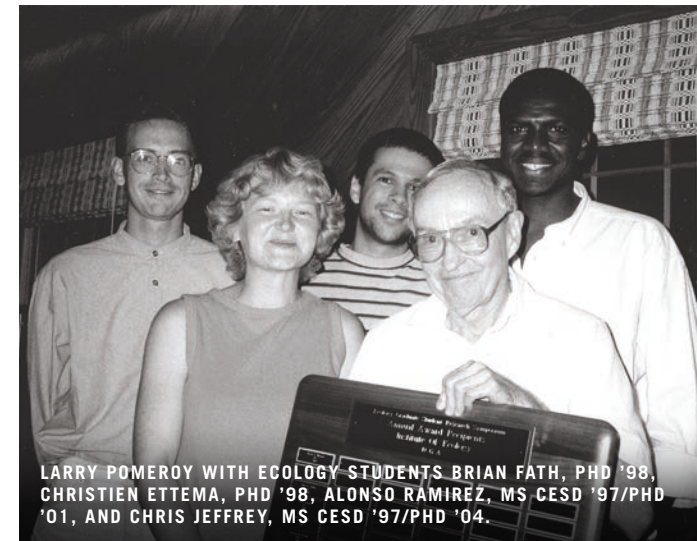
Once Dr. Pomeroy joined the zoology department at UGA, his research interests began to expand to include studies of microbial ecology in both coastal

and oceanographic systems. He also began conducting research in the Pacific Ocean. In 1971 he and his postdoc, the late Bob Johannes, led the Symbios Expedition to Enewetak Atoll in the Marshall Islands aboard the R/V *Alpha Helix*. With an interdisciplinary crew of 25 ecologists and oceanographers, the two-month Symbios Expedition was the most comprehensive study of coral reefs to have been done at that time. It was designed to follow and expand upon Eugene and Howard T. Odum’s groundbreaking 1954 study of energy flow across the coral reef ecosystem on Enewetak. The results of the Symbios Expedition continue to influence the scientific understanding of coral reef ecosystems to this day.



Dr. Pomeroy’s contributions to science were many, including research that changed our understanding of phosphorus cycling, the promotion and use of high-quality food web modeling, and studies of how temperature limits Arctic food webs. He is probably best known, however, for developing the concept of

the “microbial loop.” His 1974 paper in *BioScience*, “The Ocean’s Food Web: A Changing Paradigm,” completely upended the established scientific understanding of the trophic dynamics of the ocean. His idea that microbes, rather than large organisms, were the driving force in marine food webs was radical at the time, and only began to be accepted in the 1980s when it was backed up by another scientist, Farooq Azam, using new technology. This concept of the microbial loop became highly influential in terrestrial soil ecology as well. In 1993, the Microbial Loop Symposium was held in honor of Dr. Pomeroy’s enormous contributions to microbial ecology.



LARRY POMEROY WITH ECOLOGY STUDENTS BRIAN FATH, PHD '98, CHRISTIEN ETTEMA, PHD '98, ALONSO RAMIREZ, MS CESD '97/PHD '01, AND CHRIS JEFFREY, MS CESD '97/PHD '04.

Dr. Pomeroy was elected a Fellow of the American Association for the Advancement of Science in 1958 and served as president of the Association for the Sciences of Limnology and Oceanography from 1983–84. Among his many other honors and awards were the Antarctica Service Medal from the National Science Foundation, the A.G. Huntsman Award for Excellence in the Marine Sciences from the Royal Society of Canada, the Odum Lifetime Achievement Award from the Coastal and Estuarine Research Federation, the G. Evelyn Hutchinson Medal from the Association for the Sciences of Limnology and Oceanography in recognition of his “clear thinking and leadership in studies of phosphorus and microbes in estuaries and oceans,” and the University of Georgia Creative Research Award. He published more than 100 scholarly works and mentored 27 graduate students. He retired in 1992 as Alumni Foundation Distinguished Professor.

He left behind his children, Cheryl Pomeroy of Cuenca, Ecuador, and Russell Pomeroy, of Greensboro, North Carolina, and three grandchildren, Claire P. Gerner and Jacob and Katy Pomeroy. He was predeceased by Janet Klerk Pomeroy, his beloved wife of 57 years, who passed away in 2009.

### IN MEMORIAM

We are deeply saddened to learn of the passing of these extraordinary individuals who were members of the Ecology alumni community. We extend our deepest condolences to their families and friends.

Jay W. Becker, MS CESD '95  
of Yakima, Washington  
July 9, 2020

Callie M. Hall, MS '98  
of Diamondhead, Mississippi  
Jan. 31, 2021

Amy J. Janvier, BS '17  
of Loganville, Georgia  
July 1, 2020

Lucy W. King, BS '56  
of Colbert, Georgia  
Dec. 31 2020

Erin S. Lindquist, PhD '03  
of Raleigh, North Carolina  
Aug. 2, 2019

George B. Rose, PhD '69  
of Springfield, Illinois  
July 19, 2019

Carolyn L. Thomas, MS '78  
of Ferrum, Virginia  
Jan. 14, 2020



To view tributes to Dr. Pomeroy from family, friends, students, and colleagues, visit [t.uga.edu/5Pf](http://t.uga.edu/5Pf). Gifts in memory of Dr. Pomeroy may be made to the Ecology Fund at the University of Georgia to support students working in the areas of coastal ecology and marine ecosystem studies by visiting [ecology.uga.edu/give/](http://ecology.uga.edu/give/) and including Pomeroy in the Special Instructions / Comments area, or by sending a check to:

UGA Foundation  
One Press Place  
Suite 101  
Athens, GA 30602

Please make your check out to UGA Foundation with Ecology Fund/Pomeroy in the memo line.



# JOHN L. GITTLEMAN MOVES TO FACULTY ROLE AFTER 14 YEARS AS DEAN

John L. Gittleman arrived at UGA from the University of Virginia in 2006 to become the director of the Institute of Ecology, then part of the College of Environment and Design. Within a year, the Institute became the Odum School of Ecology, and on July 1, 2007, Gittleman was named dean. After 14 years, on June 30, 2021, he steps down from the position. He will remain on the school's faculty.

While director of the Institute, Gittleman developed the proposal to form the Odum School. As dean, he oversaw many associated changes, including the development of the administrative structure required of a standalone school within the university and a new comprehensive strategic plan, and created the iconic images for the school's original logo.

During his term, the Center for the Ecology of Infectious Diseases, which like the River Basin Center draws members from across campus but is housed in the Odum School, was launched in 2016. In terms of instruction, the School added two new degrees, the doctorate in Integrative Conservation and Ecology in 2011 and the Bachelor of Arts in 2015, as well as the Interdisciplinary Disease Ecology Across Scales (IDEAS) doctoral training area of emphasis. Faculty numbers increased by a third, external funding doubled, and, mainly driven by the AB degree program, undergraduate majors have more than doubled. Throughout, the quality of scholarship has remained consistently high, with faculty and students regularly publishing in journals such as *Science*, *Nature*, and *Proceedings of the National Academy of Sciences*.

"When I look back, it's the intellectual ideas, new ecological discoveries and the teaching of these ideas to the next generation that mean the most to me," said Gittleman. "I think this is what academic institutions should care about, what really matters."

As Gittleman transitions to a faculty role, his plans for the future include continuing his involvement with the American Veterinary Medical Association and the Committee for International Veterinary Affairs. He will also continue to work with the UGA administration on

projects focused on sustainability and the environmental sciences and on artificial intelligence and computational approaches. "I think these are areas the university could be a national and world leader," he said.

Gittleman is also looking forward to delving into research again. "As I look back on my years as dean, I probably spent maybe 30% of my time doing some research and teaching graduate students and working with postdocs, but that has gradually declined," he said. "And so a part of my future in the next three to six months or so is to have time to think and assess. The

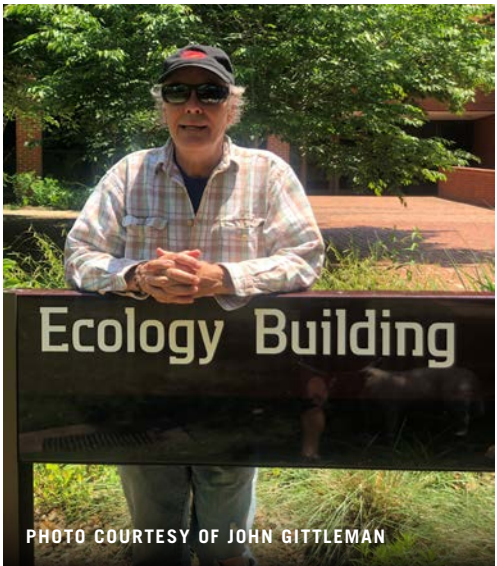
area that I'm most excited about is global macro perspectives on what I see are the three most important interactive terms that are changing the planet. And those are climate, declining species biodiversity, and disease."

He will also continue working with an international group of researchers led by Assoc. Research Scientist Patrick Stephens. "We're trying to get a handle on conservation and disease in the most unknown vertebrate group, which are the reptiles," he said. "We know a lot about birds, mammals, and amphibians; we know very little about reptiles."

Other potential projects involve research questions Gittleman has been curious about for many years but hasn't had the chance to explore. Many of these relate to the effects of life histories, body size, and social structure on disease and extinction in mammals.

Looking ahead to the next chapter for the school, Gittleman feels the future is bright as Sonia Altizer takes over as interim dean.

"Sonia Altizer has been at the university for many years. She is one of the leading researchers and educators at the University of Georgia and I think that she will do a fabulous job with new, different approaches than I've taken," he said. "I felt when I started and I feel now, that the Odum School of Ecology has a unique position and contribution to make to the University of doing the best integrated interdisciplinary ecological science that we can possibly do."



# CONGRATULATIONS GRADUATES!



## GRADUATE STUDENTS

### CLASS OF 2020

Zachary Butler, MS CESD  
Michelle Evans, PhD ICON and Ecology  
Christine Fallon, MS Ecology  
Daniel Hawkins, MS CESD  
Emily Johnson, MS CESD  
Alexandra Kenna, MS Ecology  
Ashley LaVere, MS CESD  
Cara Love, PhD Ecology  
Paige Miller, PhD Ecology  
Laura Rack, MS CESD  
Jonathon Skaggs, MS CESD  
Dexter Strother, PhD Ecology  
Pedro Torres, PhD Ecology  
John Vinson, PhD Ecology

### CLASS OF 2021

Zachary Arnold, MS CESD  
Theresa Hudson, MS CESD  
Gregory Jacobs, PhD Ecology  
Cody Prouty, MS Ecology  
Claire Teitelbaum, PhD Ecology

## UNDERGRADUATES

### CLASS OF 2020

Bailey Andree, AB  
Harrison Arnold, BS  
Zachary Arnold, BS, *summa cum laude*  
Vincent Artigues, BS  
Evan Barnard, AB, *cum laude*  
Jaime Becker, BS  
Andrew Bennett, BS  
Savannah Brock, AB  
Marley Brown, AB  
Thomas Brown, AB  
Flora Chanda, BS  
Campbell Caldwell, AB, *magna cum laude*  
Eleanor Duffy, AB, *magna cum laude*  
Benjamin Edelman, BS  
Taylor Eidson, BS  
Rebecca Farley, BS

Reilly Farrell, BS, *magna cum laude*  
Elizabeth Felt, AB  
Mia Fernandez, AB  
Grant Foster, BS, *summa cum laude*  
with Highest Honors  
Ivy Francis, BS, *magna cum laude*  
Brady Griggs, BS  
Katie Gwaltney, AB  
M. Hall, AB  
Richard Hull, BS, *magna cum laude*  
Mary Hunt, AB, *magna cum laude*  
Christian Hurd, BS  
Joseph Kinsinger, BS, *cum laude*  
Diane Klement, AB, *summa cum laude* with Highest Honors  
Amy Kuhn, BS  
James Mack, AB  
Reagan Mahaley, BS, *magna cum laude*  
Allison Martin, BS  
Kelly Mayes, AB, *cum laude*  
April McCoy, AB  
Emily Monroe, BS  
Emily Noakes, BS  
Rebecca Owens, BS  
Wesley Peebles, AB, *summa cum laude*  
Candace Pinney, AB  
Nicole Reisinger, BS  
Greyson Roberts, BS  
Jackson Roper, AB  
Myles Rosenberg, BS  
Abigail Sawyer, AB, *cum laude*  
John Mark Simmons, BS  
Jacob Simon, BS, *magna cum laude*  
with High Honors  
Ashley Strickland, BS  
Victoria Swyers, AB, *cum laude*  
Kayla Wagner, BS  
Sydney Wright, AB

### CLASS OF 2021

Cydney Abel, AB  
Caroline Aikins, BS, *magna cum laude*  
Kaylyn Barnes, AB, *summa cum laude*  
Jared Bennett, BS, *cum laude*  
Amaad Blades, BS  
C. Seth Carey, AB, *cum laude*

Katherine Christie, BS, *summa cum laude* with Highest Honors  
William Churchwell, BS, *magna cum laude*  
Emma Bay Dickinson, BS, *cum laude* with Honors  
Miriam Edelkind-Vealey, BS, *cum laude*  
Juliet Eden, AB  
Brendan Everling, BS  
Maya Ferguson, BS  
Thomas Fitzpatrick, BS, *cum laude*  
Nathaniel Haulk, BS, *summa cum laude*  
Amanda Howard, AB, *magna cum laude* with Honors  
Presley James, BS, First Honor Graduate and *summa cum laude*  
Elizabeth Jurado, BS, *cum laude*  
Lauren Keeler, BS, *magna cum laude*  
Culzean Kennedy, BS, *summa cum laude* with Highest Honors  
Kathryn King, AB, *cum laude*  
Lucas Lambert, AB  
Samuel Lopez, AB  
Hannah Maddux, BS  
Karis Mahaffey, AB, *magna cum laude*  
Jenna McLoughlin, AB  
Taylor Mizelle, BS  
Ansley Nash, AB  
Somerlin Nixon, BS, *summa cum laude*  
Sarah Petrea, AB  
Chancey Phillips, AB  
Mackenzie Ressel, AB  
Sarah Sellers, AB  
Ella Settle, BS  
Lyndon Sullivan-Brugger, BS, *magna cum laude*  
Benjamin Thomas, BS  
Kerstin Thulé, BS, *summa cum laude*  
Lauren Towe, AB, *cum laude*  
Isabel Wargowsky, BS, *magna cum laude*  
Jacob Warren, BS  
Matthew Whiting, AB  
Destiny Willard, AB  
Brett Williamson, BS, *cum laude*  
Irene Wright, AB





2010s

**JACOB ALLGEIER**, PhD '13, was named an Early Career Fellow of the Ecological Society of America in 2020. Jake, an assistant professor of ecology and evolutionary biology at the University of Michigan, was recognized for “integrating ecosystem and community ecology to help advance understanding of nutrient dynamics in marine ecosystems and the role of consumers in mediating these processes, and for efforts to apply this information towards the conservation of coastal marine ecosystems.” Early Career Fellows, elected to a five-year term, are chosen from among members within eight years of completing their doctoral or other terminal degree. They are selected for advancing ecological knowledge or application and showing promise for continuing to make outstanding contributions to ecology.

**DANIEL BECKER**, PhD '17, received the Sidnie Manton Award from the British Ecological Society in 2020. The award recognizes the best review article in the *Journal of Animal Ecology* by an early career researcher. In 2020, Dan joined the faculty of the University of Oklahoma as an assistant professor of biology. He was previously the Intelligence Community Postdoctoral Fellow at Indiana University and a postdoctoral researcher at Montana State University.

**ANYA BROWN**, PhD '18, is currently a postdoctoral scholar at the Woods Hole Oceanographic Institution, where she is studying the microbial changes as temperate coral go into and out of dormancy to understand how microbes influence coral recovery. She joined WHOI after two years as the John J. and Katherine C. Ewel Postdoctoral Fellow at the University of Florida. In 2022 she will begin a new position as an Assistant Professor at the University of California, Davis, at the Bodega Bay Marine Lab.

**MAURA DUDLEY**, PhD '18, adjunct professor of biology at Oglethorpe University, led a study that was recently published in *Forest Ecology and Management*. “Rethinking foundation species in a changing world: The case for *Rhododendron maximum* as an emerging foundation species in shifting ecosystems of the southern Appalachians,” (online at [doi.org/10.1016/j.foreco.2020.118240](https://doi.org/10.1016/j.foreco.2020.118240)) was featured in an article on the LTER Network website: “Seeing the forest for the shrubs in southern Appalachia” is online at [bit.ly/dudley18](https://bit.ly/dudley18).

**ADAM HAVILAND**, BS '12, is currently an Infectious Disease Fellow at the Albert Einstein College of Medicine and Montefiore Health System, and wrote in the spring of 2020 that he is among the medical personnel fighting COVID-19 in New York City.

**CARMEN KRAUS**, BS '15, is serving as a Natural Resources Interpretive Assistant at the North Rim of Grand Canyon as part of the Scientists in Parks program, a joint venture of Stewards Individual Placements, the National Park Service and the Geological Society of America.

**ERIN MALSBUY**, BS '19, received a master’s degree

in science communication from the University of California, Santa Cruz, in 2020, and is now a freelance science writer and photographer. Her work has appeared in *Smithsonian Magazine*, *Science Magazine*, the *Mercury News*, the *Monterey Herald*, and *Good Times*, among other outlets.

**JULIE RUSHMORE**, PhD '13, joined the U.S. Centers for Disease Control and Prevention in 2019 as an Epidemic Intelligence Service Officer, and is now serving as an epidemiologist there. She came to the CDC from the One Health Institute at the University of California, Davis, where she was a postdoctoral researcher. Julie received a DVM with a focus in public health from the UGA College of Veterinary Medicine in 2017.

**DARA SATTERFIELD**, PhD '16, is a CITES Policy Specialist with the U.S. Fish and Wildlife Service, where she helps to represent the U.S. in the Convention on International Trade in Endangered Species, one of the world's oldest and largest multilateral environmental treaties. Working with USFWS and State Department colleagues, Dara assists with writing U.S. positions on CITES proposals for species protections and communicates with other countries and with U.S. Embassies to improve CITES capacity abroad. She served previously as an AAAS Science & Technology Policy Fellow at USFWS and as a James Smithsonian Postdoctoral Fellow at the Smithsonian Migratory Bird Center. Dara recently spoke about her career path to Odum students as part of the Non-Academic Careers Panel hosted by the Ecology Graduate Student Organization.

**JOHN MARK SIMMONS**, BS '20, and a group of friends including current ecology undergraduate Josiah Lavender, set a new state record for a birding Big Day on April 25, 2021. Starting immediately after midnight, John Mark and Josiah, along with Patrick Maurice and Mac McCall spent the next 24 hours crossing the state. In their travels from Athens to the Georgia coast they found 196 species, beating the Big Day record of 193 that was set in 2004.

**DANIEL STREICKER**, PhD '11, was featured on National Public Radio's *TED Radio Hour*. “Daniel Streicker: What If We Could Stop A Virus at Its Animal Source?” aired in December 2020 (Listen here: [bit.ly/streickerr11](https://bit.ly/streickerr11)). Dan is a Wellcome Trust Senior Research Fellow in the Institute of Biodiversity, Animal Health, and Comparative Medicine at the University of Glasgow and in the Medical Research Council-University of Glasgow Centre for Virus Research.

**WARING “BUCK” TRIBLE**, BS '13, was lead author on a study, “Globally invasive populations of the clonal raider ant are derived from Bangladesh,” published in *Biology Letters* in 2020 (available online at [doi.org/10.1098/rsbl.2020.0105](https://doi.org/10.1098/rsbl.2020.0105)). Buck completed his doctorate in 2019 at Rockefeller University and is now a John Harvard Distinguished Science Fellow at Harvard University and a recipient of the National

Institutes of Health Early Independence Award. Buck’s lab focuses on the development and evolution of morphological castes in ants. He was recently profiled in a story in the *Harvard Gazette*, “Tracking an invasive ant species to its native land,” available online at [bit.ly/tribler13](https://bit.ly/tribler13).

**AMY TRICE**, MS '11, Director of Ocean Planning for Ocean Conservancy, coauthored a paper in *Nature Ecology & Evolution*, “Integrated ocean management for a sustainable ocean economy.” It is available online at [bit.ly/trice11](https://bit.ly/trice11).

**2000s**

**ANDREW DURSO**, BS '09, joined the faculty at Florida Gulf Coast University in January 2020 as an assistant professor of wildlife biology. He was previously a postdoctoral researcher at the University of Geneva and the technical and scientific publications editor at the Max Planck Institute for Biogeochemistry in Jena, Germany. Andrew received his doctorate from Utah State University in 2016.

**REBECCA ESSELMAN**, MS CESD '01, was named executive director of the Huron River Watershed Council, a nonprofit coalition of residents, businesses and local governments working to protect and restore the Huron River and its tributaries, lakes, and groundwater, in 2019. She was recently featured in a story on public radio station WEMU: [bit.ly/2T4hZuk](https://bit.ly/2T4hZuk).

**JOHN KOMINOSKI**, PhD '08, associate professor of biological sciences at Florida International University, has been named the lead principal investigator for the Florida Coastal Everglades Long Term Ecological Research (FCE LTER) program. He takes over the reins from **EVELYN GAISER**, PhD '97, who has led the program since 2007; she is the Endowed George Barley Eminent Scholars Chair at FIU's Institute of Environment. In 2021 the National Science Foundation issued a four-year \$4.75 million renewal of the FCE LTER program.

**MICHAEL MADRITCH**, PhD '02, was named associate dean of the College of Arts and Sciences at Appalachian State University in 2020. Mike joined the faculty in the department of biology at Appalachian in 2009 as an assistant professor, was promoted to full professor in 2019, and has served as assistant chair for the department of biology since 2015.

**CARALYN ZEHNEDER**, PhD '06, coauthored a book, *Learning That Matters: A Field Guide to Course Design for Transformative Education*, published by Myers Education Press in 2021, to help educators craft meaningful and motivating learning experiences. Caralyn, who is currently a lecturer in biology at the University of Massachusetts, Amherst, said that she and her coauthors wrote the book to provide a resource for faculty who want to motivate, challenge, engage and affirm their students, which she described as an urgent need. “As the events of 2020 and early 2021 have underscored, never has it been more apparent that change to our basic institutions is needed. Trajectory-altering learning

experiences can no longer be secreted away for a favored few. We wrote this book to empower faculty to teach transformative courses that support all students,” she wrote.

1990s

**SHUIJIN HU**, PhD '94, a professor of soil ecology in the department of entomology and plant pathology at North Carolina State University, was elected a Fellow of the Ecological Society of America in 2021 in recognition of his “influential research in the fields of plant–microbe interactions, ecosystem ecology and global change ecology, and for his dedication to pedagogy.”

1980s

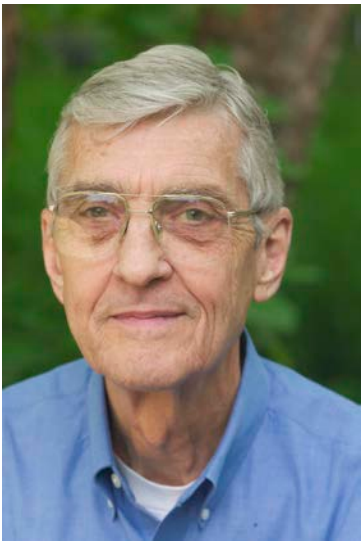
**BOPAIAH BIDDANDA**, PhD '87, Professor of Water Resources at the Annis Water Resources Institute at Grand Valley State University, was lead author on a paper inspired by the work and communication style of the late Prof. Emeritus Larry Pomeroy. In “Housekeeping in the Hydrosphere: Microbial Cooking, Cleaning, and Control under Stress,” published in the journal *Life* in February, 2021, Biddanda and his colleagues discussed developments in the study of aquatic microbial ecology prompted by Pomeroy’s foundational *BioScience* paper “The Ocean’s Food Web, a Changing Paradigm” in, as they describe it, a “light-hearted but rigorous review” that aims to make science relatable to a general audience. The paper is available online at [doi.org/10.3390/life11020152](https://doi.org/10.3390/life11020152).

**RANDALL HICKS**, PhD '83, retired from University of Minnesota Duluth in 2020. According to a story from UMD News, “Randall Hicks received his B.S. (zoology) from University of Oklahoma, Ph.D. (ecology) from University of Georgia, and postdoctoral experiences at Woods Hole Oceanographic Institution and the Illinois Natural History Survey. At UMD, he was the Department of Biology head, director of the Center for Freshwater Research and Policy, and a co-director of graduate studies for the Water Resources Science Graduate Program. His research includes evaluating Duluth–Superior harbor biocorrosion, ballast water discharge for harmful microbes, the sources of indicator bacteria at beaches, and planktonic Archaea in great lakes. He is widely published and has trained 40 undergraduate researchers, 26 graduate students, and 2 postdoctoral investigators.” Read more: [bit.ly/hicks83](https://bit.ly/hicks83).

**MARY ANN MORAN**, PhD '87, Regents' Professor in Marine Sciences at UGA, was elected to the National Academy of Sciences in 2021. “An internationally recognized leader in marine microbiology and microbial ecology...her work illuminates the roles that microbes play in mediating globally significant processes associated with the cycling of nutrients such as carbon and sulfur between the ocean and atmosphere,” according to the announcement from UGA.

THE NONAGENARIAN ECOLOGIST LECTURE

A gathering of alumni, friends, faculty, and students joined Regents' Prof. Emeritus **Bernard Patten** for what he dubbed “the first Nonagenarian Ecologist Lecture” on April 1, 2021—the fifty-third anniversary of his first day as a faculty member at the University of Georgia. The virtual talk, “The Network Trophic-Dynamic Aspect of Holoecology,” took place over Zoom. Patten described it as “a takeoff on a classic 1942 paper by Raymond L. Lindeman, ‘The Trophic-Dynamic Aspect of Ecology,’ which proved foundational in the development of ecosystem ecology.” **Stuart Whipple**, PhD '95, provided the introduction.



Alumni participants included **Thomas Burns**, PhD '89, **Robert Buschbacher**, PhD '84, **William Cale**, PhD '75, **Chris D'Elia**, PhD '74, **David Dow**, PhD '71, **Alyssa Gehman**, PhD '16, **Nicole Gottdenker**, PhD '09, **Efraim Halfon**, PhD '75, **Richard (Tom) James**, PhD '89, **Bart Johnson**, PhD '95, **Craig Markham**, PhD '68, **Jane Shevstov**, PhD '12, **Amy Trice**, MS '11, and **Jack Webster**, PhD '75.



Dear Alumni and Friends of Ecology,

It's been a tough year and a half filled with uncertainty, change, and fear, but also one of inspiration, fortitude, and accomplishment. I am choosing to focus on the latter.

As you've read through the pages of this magazine, I would like you to know that none of the work we've accomplished could have been done without you. You have been the calm within the storm while we've forged ahead with teaching, research, and public service and outreach through extraordinary circumstances.

You've provided consistency for our student-led initiatives like EcoReach and the Graduate Student Symposium and through awards given at Spring Fling that further enrich students' academic experiences.

I am looking forward to regaining a stronger sense of community through some of our normal activities and events like Friday Coffee Hour, Waffle Wednesday, First Friday, and convocations. For those of you who are local, please join us whenever you like. For those of you who are not so close to Athens, we welcome the opportunity to find ways to come to you.

With resilience at our core, we are headed for future growth and new opportunities led by Dr. Sonia Altizer as our new interim dean. I am excited to see what we will all continue to do together.

With your help, our faculty, postdocs, and students are further seeking ways to keep human societies thriving while protecting biodiversity, preventing species extinctions and maintaining healthy, functioning ecosystems for both land and water and implementing policy for protection; identifying climatic and environmental factors that shape the transmission of infectious diseases combined with state-of-the-art computational approaches to foreshadow disease emergence.

Thank you for the generosity of your gifts through your time, counsel, or financial resources as you partner with us and advocate for a healthy planet.

With kind regards,

*Allison Walters*

— Allison Walters  
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# RIVER BASIN CENTER POLICY CELEBRATION

**SAVE THE DATE**  
SEPT. 24-25, 2021

Join us in Athens as we highlight the past, present and future policy work of the faculty, staff, and students of the River Basin Center.

Check [rivercenter.uga.edu](http://rivercenter.uga.edu) for details.

Be sure to book your room early! The Policy Celebration coincides with AthFest ([athfest.com](http://athfest.com)), Athens' local art and music festival, and there'll be plenty of time to enjoy the festivities.

