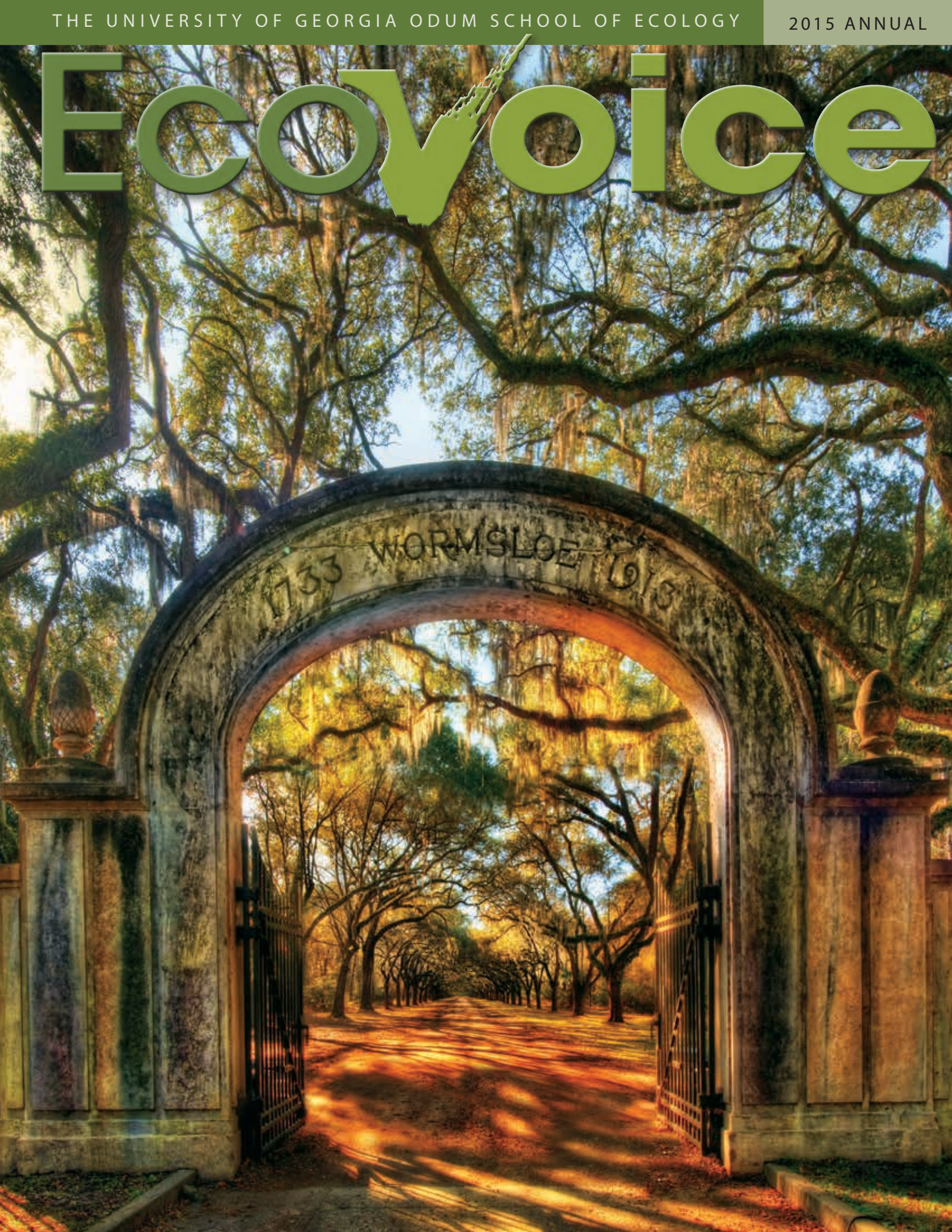


Ecovoice





Notes from the Dean

EcoVoice

2015 Annual Issue

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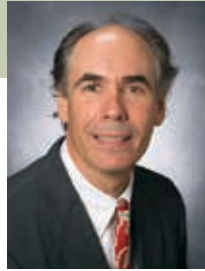
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The University of Georgia is committed to principles of equal opportunity and affirmative action.



ABOUT THE COVER

The iconic entrance to historic Wormsloe near Savannah, where Odum School ecologists are participating in innovative interdisciplinary research on topics of global concern. See story beginning on page 2. Photo detail: Trey Radcliff/
Creative Commons



JOHN L. GITTLEMAN

Take a number

Current rates of extinction are 1,000 times faster than historical patterns; 16 percent of marine species are threatened; maintenance of greenhouse gas emissions could result in 99 percent loss of glaciers; 85 percent of endangered species are vulnerable to habitat loss; 62 percent of human emerging diseases come from animals and plants. Numbers surround us and are, ecologically, often quite frightening!

But not always. At Odum we've been seeing numbers that indicate some very positive, optimistic trends.

PROGRAM GROWTH

We're very excited about our new Ecology degree, a Bachelor of Arts. The AB has an emphasis on engagement, communication, learning skills and "experiential learning." The new program builds on our core Ecology courses that are shared with our existing BS degree, then adds problem solving and communication skills. The quotation marks around "experiential learning" are to highlight that our new degree mirrors the UGA initiative to ensure that all undergraduates have some form of hands-on learning. We've already taken the lead on this with 100 percent of our graduating students this year having some research experience. Currently, we have about 100 undergraduates pursuing the BS; aiming high, we would like to add another 50 to 100 majors via the AB.

CELEBRATING MILESTONES

This year we're honoring the 20th anniversary of the Conservation Ecology and Sustainable Development graduate program (see back cover) and in 2017 the Odum School will become a quinquagenarian. Combining the dates of the establishment of the Institute (1967) and of the Odum School (2007) gives us an important anniversary to celebrate. We're already in the planning stages for exciting alumni events, special seminars showcasing past, present and future ecologists at UGA, and attendance from state, national and international leaders in ecology. Our anniversary will be here before you know it, and we'd very much like to hear your suggestions about how to commemorate it—a great way to celebrate your connection with this special place. All ideas are welcome!

So not all numbers are frightening. At the Odum School, the numbers are highlighting a long and storied history and a bright future.

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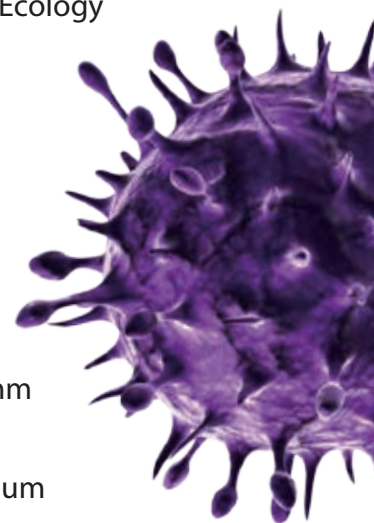
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From Wormsloe to the World

One of Georgia's most historically and environmentally significant places is home to innovative interdisciplinary research

If you're fortunate enough to visit the Wormsloe State Historic Site near Savannah, Georgia, you are likely to experience the distinct feeling of traveling backwards in time. Passing through the iconic gate, you enter the carriage road. Arrow-straight and lined with 100-year-old live oaks, it stretches for a mile and a half toward the ruins of the eighteenth century home of Noble Jones, an original founder of the Colony of Georgia. Beyond the oaks lie acres of seemingly timeless maritime forest and salt marsh. With every yard you travel, the clamor of the twenty-first century recedes.

But this sense of separation from the contemporary world is not entirely accurate. Not only is Wormsloe a place of tremendous historical significance, it also hosts a growing number of exciting contemporary research projects. Evidence can be found in a sunny clearing just off the main road, where ecology doctoral student Ania Majewska is overseeing a set of experimental butterfly gardens to inves-

tigate their effectiveness in maintaining pollinator populations—just one of the research initiatives with global implications taking place at Wormsloe today.

Wormsloe has long been a place dedicated as much to forward-thinking inquiry as to stewardship and conservation. And since the founding of the Wormsloe Institute for Environmental History and the Wormsloe Fellows

program in 2007, it has been at the center of some of the most innovative scientific and historical research being done today. Thanks to the generosity of the Wormsloe Institute for Environmental History, the Wormsloe Foundation, and Wormsloe's owners, ninth-generation Jones descendant Craig Barrow III and his wife Diana, students and faculty from the Odum School are playing a part.





Wormsloe was established in 1736 by founding Georgia colonist Noble Jones; it has remained in his family ever since. Today it is home to ninth generation descendant Craig Barrow III and his wife Diana Deas Barrow, who carry on the family tradition of public service, stewardship, inquiry, and strong ties to the University of Georgia.

A History of Service, Stewardship, and Inquiry

The first human habitation of what is now Wormsloe dates back 6,000 years; archaeological evidence indicates that the Guale people inhabited the site from roughly 4,000 B.C. until the late 1600s. In 1736 Noble Jones established Wormsloe as a farm and fortification on the Isle of Hope outside of Savannah. Located on Jones Narrows, a bend of the Skidaway River that was part of the intracoastal waterway of its era, it was well situated to guard against potential invasion from Spanish Florida.

The historical record reveals that along with his efforts to protect the new colony, Noble Jones was concerned both with the conservation of Wormsloe's natural resources and with horticultural experi-

Wormsloe, encompassing a variety of coastal ecological communities, is ideally situated for research about issues of global concern such as sea level rise and species invasions.

mentation; that family tradition of public service, stewardship, and inquiry has continued ever since, and much of it involves the University of Georgia.

Jones's descendants kept thorough records of their use and management of Wormsloe; those papers, along with the family's collection of documents relating to Georgia history, form the basis of the Hargrett Rare Book and Manuscript Library at UGA. The family created the Wormsloe Foundation to support scholarly research about the history and culture of Georgia and the South, establishing the Wormsloe Foundation Publication and Wormsloe Foundation Nature Book series at the UGA Press. In 1972 Craig Barrow III and his father donated 822 acres to the state to create the Wormsloe State Historic Site.

The Barrows, who live on the property in the 1820s home that replaced the original fortified tabby house, wanted to do more. In 2007, with Sarah Ross as director, they created the Wormsloe Institute for Environmental History, an organization dedicated to the conservation and

interdisciplinary study of Wormsloe and its environmental and cultural history in the context of the southeastern coast. WIEH and the Wormsloe Foundation then partnered with the UGA Graduate School to establish the Wormsloe Fellows program.

In 2013 the Wormsloe Foundation deeded 15 acres to UGA to create the UGA Center for Research and Education at Wormsloe. The UGA CREW property includes a restored slave cabin dating to the 1850s, currently used to house researchers. Construction of several new buildings, designed to provide more housing and research facilities while respecting the historic character of the site, is underway. The UGA CREW complex will greatly expand Wormsloe's—and UGA's—capacity for producing world-class research.

“Being a good steward means conserving the past but also looking toward the future,” says Barrow. “As the ninth generation of my family to be entrusted with Wormsloe, I’m responsible for ensuring that it continues, not as a museum piece frozen in time but as a real, functioning place. The best way I know to make sure that happens is through our partnerships with the Georgia Department of Natural Resources and UGA and our phenomenal Wormsloe Fellows. Diana and I are delighted to have them here.”

Wormsloe Fellow Alyssa Gehman and Sarah Ross, director of the Wormsloe Institute for Environmental History and the UGA Center for Research and Education at Wormsloe, travel by boat to set up a pilot experiment with help from volunteer Douglas Duch. He and his wife Barbara are WIEH donors whose gifts support the Wormsloe Fellows program, including allowing the Fellows the use of their boat for research purposes.



Research for the 21st Century

Research at Wormsloe is led by Sarah Ross, director of UGA CREW and the Wormsloe Institute for Environmental History. Ross, who is on the faculty of the UGA College of Environment and Design, is the former director of education for the National Oceanic and Atmospheric Administration and, prior to that, national education coordinator for the National Marine Sanctuary Program. Her first step as director of WIEH was to assemble a multidisciplinary science advisory council. The 11-member group includes Odum School Professor Emeritus Ron Carroll and UGA faculty in history, anthropology, environmental design, and geography, as well as experts from the Georgia Department of Natural Resources and the U.S. Fish and Wildlife Service.

The WIEH research program is organized around questions that apply to Wormsloe itself but also have broader implications. Ross bases WIEH's research priorities on those identified by the American Academy for the Advancement

of Science and the National Academy of Sciences as the most important for the U.S. and globally. These include sea level rise, biodiversity and invasive species, issues related to fresh water, and infectious disease epidemiology.

Because of its location, land use history, and extensive documentation, Wormsloe is ideally suited for studying these kinds of issues. Consider sea level rise. In the 1920s, the U.S. Army Corps of Engineers, deeming Jones Narrows too winding, rerouted the intracoastal waterway by straightening nearby Skidaway Creek. In the 1970s the historic natural flow through the system was eliminated by the dumping of dredge spoil from the construction of the Diamond Causeway.

"We have a living laboratory to study sea level rise and its effects on the coastal ecological communities—the salt marshes, tidal creeks, maritime forests, and freshwater ecosystems we have here at Wormsloe," says Ross. "And with the marsh closed off, we see an amplification of sea level rise trends. That means that what we learn here can provide a basis for modeling how hurricanes and storm events impact the

physical environment—information that could save lives in low-lying coastal population centers."

The Wormsloe Fellows

This kind of research requires an interdisciplinary approach, which is why WIEH and the Wormsloe Foundation partnered with the UGA Graduate School to establish the Wormsloe Fellows program.

Wormsloe Fellowships support a varying number of graduate students each year from areas including history, environmental design, geography, and ecology, among others. The Fellows conduct research on site and meet monthly to report on their progress and exchange information with one another and their faculty advisors.

"Each semester we have at least three different academic areas represented," says Ross. "I think it's not only critically important for the students to have the opportunity to work functionally in an interdisciplinary setting, but a multidisciplinary way of looking at Wormsloe is the most responsible way to do research here. Data

from one area of research is fundamentally important to others.”

Odum School Wormsloe Fellow Alyssa Gehman says that working with students from other disciplines has enriched her research. “Our regular meetings have given me a chance to practice summarizing and communicating the key findings of my research with a diverse group of students,” says Gehman. “In addition it has been fascinating to learn about the graduate research of the other Fellows on site and to get to understand their research. Some of the Fellows were able to provide information that was able to inform and expand on the ideas that I’ve had working on the site. For example the work done by Paul Cady of the College of Environment and Design documenting land use and the changing marsh and river edges sparked ideas for ways we could look at legacy effects on marsh ecosystems.”

Ross also meets regularly with other coastal managers to discuss the research going on at Wormsloe and elsewhere, partly to ensure that there is no duplication of effort but also to make sure that the region’s research needs are being met. “At this juncture, on the coast of Georgia, the threats are coming faster and faster, particularly with sea level rise and invasive

species,” she says. “If there are emerging threats that have a common cause, we at Wormsloe may be able to contribute in an important way.”

Along with financial support, Wormsloe Fellows receive on site housing and access to advanced technology and equipment such as GIS, ground penetrating radar, LiDAR, aerial drones, side scanning sonar, and camera traps.

“I can’t emphasize enough the importance of the support given by the Wormsloe Foundation, the Wormsloe Institute, and the Barrows personally, to the Odum School and our Wormsloe Fellows,” says Odum School Dean John Gittleman. “The research they’re producing at Wormsloe is providing insight into some of the most vexing issues in ecology today.”

Ecology Research at Wormsloe

Research by the Odum School’s Wormsloe Fellows has spanned the gamut of WIEH’s research priorities, increasing the body of knowledge about the ecology of Wormsloe itself while contributing to questions of regional, national, and global significance.

As the Odum School’s first Wormsloe Fellow from 2010–2011, doctoral student Jenny Pahl, MS CESD ’09, studied the feasibility of using constructed wetlands for wastewater treatment and wetland mitigation in the coastal plain region, under the direction of Professor Emeritus Ron Carroll. Her work at Wormsloe was driven by the projected increase in visitors to the Wormsloe State Historic Site and the need to deal with problems with existing septic system capacity—an issue of concern in areas like the coastal plain with its sandy soils, where septic systems can contribute to degraded water quality. Constructed wetlands also create freshwater habitats which are declining rapidly along the coast.

Emily Cornelius, MS ’13, now a doctoral student at the University of Wisconsin-Madison, was a Wormsloe Fellow from 2011–13. She studied how parasites influence migrations in Neotropical songbirds. These birds undertake extreme long-distance journeys that require immense amounts of energy, so identifying factors that can hinder their energy supply—like parasites—provides useful information for the conservation of bird migrations. Wormsloe, with its nearly 1,400 acres of coastal habitat surrounded by suburban development, is an important migratory stopover point on the Atlantic flyway, making it an ideal place for this kind of research. Cornelius worked with Sonia Altizer, associate dean and UGA Athletic Association Professor in Ecology and Assistant Research Scientist Andy Davis to investigate how fat storage, stress, parasites, and immune defenses interact during the migrations of several songbird species that pass through coastal Georgia each fall. Her master’s work was published in 2014 in the journal *Physiological and Biochemical Zoology*.



Wormsloe Fellow Emily Cornelius, MS ’13, works in the De Renne Library at Wormsloe to record data about a ruby-crowned kinglet as part of her study of the effects of parasites on Neotropical songbird migration. The bird was later released to continue its migratory journey.

Mud Crabs and Monarchs

The Odum School's current Wormsloe Fellows are studying the complex inter-connections of species invasions, biodiversity conservation, and infectious diseases, issues that are impacting ecosystems at Wormsloe and around the world, in very different systems.

Doctoral student Alyssa Gehman, a Wormsloe Fellow from 2013-2015, is interested in understanding the ecological drivers of parasite abundance in southeastern salt marshes, particularly how parasite-host interactions are affected by predators and by rising temperatures.

Gehman, who works with Professor Jeb Byers, studies an invasive parasitic barnacle and its host. The barnacle, *Loxothylacus panopaei*, originally from the Gulf of Mexico, is today found along the Atlantic sea coast from the Chesapeake Bay to Florida. It infects mud crabs, a species of small crabs that live on oyster beds. The barnacle castrates its host and creates an

externa, an external reproductive organ, essentially converting the mud crab into a producer of barnacle offspring—even if the crab happens to be male. Up to 80 percent of mud crab populations may be infected.

The barnacles are not the only threat to mud crabs; they must also avoid predators like the much larger blue crab, which are native to the region. Gehman has found that infected crabs are consumed at higher rates than healthy ones—on average, three times higher—possibly because the externa protruding from their bodies prevent them from escaping into the nooks and crannies of their oyster reef homes. While this is bad news for the individual mud crabs in question, it could prove just the opposite for the species as a whole; by feasting selectively on the infected crabs, this native predator could potentially reduce or even wipe out the invasive parasite populations.

Gehman is also interested in the effects of temperature on host-parasite dynamics. Rising temperatures can be associated with

an increase in parasite reproduction—meaning that as global temperatures rise, parasites and disease may also increase. But if a host species can tolerate higher temperatures than its parasite, overall parasite numbers could decline. Gehman is conducting experiments to find out how temperature affects the parasite's reproduction and host and parasite survival rates. What she learns will inform our understanding of how these species may respond to climate change.

Ania Majewska's butterfly garden project is also focused on a problem of global concern.

Pollinators like butterflies and bees, which are critical to the world's food supply, are in decline. Among the culprits that have been identified are habitat loss and infectious diseases. Monarch butterflies in North America, which migrate between wintering grounds in Mexico to breeding areas in the U.S. and Canada, face both problems. Monarchs have experienced dramatic habitat loss in both their breeding grounds

Gehman and undergraduate ecology major Aaron Penn use the facilities at the nearby Skidaway Institute of Oceanography to work with oysters collected from Wormsloe. Gehman studies a parasite that infects mud crabs, which live in oyster beds.





Wormsloe Fellow Ania Majewska oversees the 12 experimental butterfly garden plots at Wormsloe, which were installed with help from Craig Barrow III and Sarah Ross. She is studying the effectiveness of different planting and maintenance regimes in supporting pollinators.

in the U.S. and at wintering sites in Mexico in recent decades. Moreover, monarchs are commonly infected by a protozoan parasite that can cause deformities, inhibit flight, and increase mortality.

One potential solution to support the conservation of monarchs and other pollinators is backyard butterfly gardens, which are often planted in an effort to replace some of the butterflies' lost natural habitat. There has been little, if any, research showing whether such gardens are beneficial, however. Majewska's Wormsloe butterfly garden project aims to fill that gap by determining how well pollinator gardens work at attracting butterflies, whether butterflies are reproducing there, the survival rate of butterflies in gardens, and how different planting and maintenance regimes influence their effectiveness.

With the enthusiastic support of Barrow and Ross—who cleared the land, dug the post holes, and installed the fencing—

Majewska and her faculty advisors Sonia Altizer and Andy Davis established 12 experimental garden plots. To ensure that they were ideally sited, the Barrows offered the use of their own property for 10 of the gardens, and installed an irrigation system to make sure that each plot receives equal amounts of water.

The experiment is designed to find out whether plant type—native or non-native—and intensity of garden maintenance have significant effects on butterfly populations. Majewska will also explore how plant choice and maintenance regimes affect parasite loads in monarch butterflies, a question raised by the work of another Odum School doctoral student, Dara Satterfield (see “Cancelled Flights,” page 9). The results of Majewska's research will motivate scientifically-informed management strategies for backyard gardens as one of many tools for pollinator conservation.

From Wormsloe to the World

Research at Wormsloe, according to Ross, is still in its initial phase. “Not only do we have some very basic questions that we need answered about this site, there are questions that need to be answered for this coastal margin in Georgia,” she says. And some of those questions, whether focused on rising sea levels, invasive species, the spread of infectious diseases, the decline of pollinators, or maintaining water quality, address issues of worldwide importance.

“In the Odum School, our mission is to shape the future of ecological inquiry so that we better understand and sustainably manage our rapidly changing planet,” says Dean Gittleman. “And that's exactly what is happening with the work being done at Wormsloe.”

Epidemic Modeling, Ebola, and Tipping Points

Odum ecologists develop new disease forecasting tools

Epidemic modeling is an important tool in the fight against infectious diseases. But in the case of the 2014 Ebola crisis, existing models did not incorporate all the variables needed to accurately forecast the course of the disease.

Enter Odum School Associate Professor John Drake, who had just received a five-year, \$3.178 million grant from the National Institutes of Health Institute of General Medical Sciences Models of Infectious Disease Agent Study for a project to develop models to forecast the emergence and re-emergence of infectious disease outbreaks.

Drake and his team, including Odum doctoral student Reni Kaul, undergraduate Laura Alexander, postdoctoral associate

Using a mathematical formulation known as branching processes—a way of keeping track of all possible epidemic outcomes in proportion to their probabilities—calibrated with newly developed methods, Drake and his team found that the response by the Liberian government and international groups had greatly reduced the likelihood of a massive epidemic. They reported their findings in *PLOS Biology* in January 2015, predicting that if the then-current rate of hospitalization and vigilance could be maintained, the Ebola epidemic in Liberia would likely be eliminated by June 2015. And the model, with its new methods, should

when a disease system is approaching a “tipping point”—a threshold at which conditions become favorable for an outbreak to occur.

Drake explains that tipping points occur in all kinds of complex systems—everything from financial markets to earth’s climate system. Once a tipping point has been passed, the system is vulnerable to collapse. But before that happens, there are signals that can alert observers that a tipping point is imminent.

In 2010, Drake became the first scientist to demonstrate that tipping points could be used to predict extinction in biological systems.

“Shortly after that, it occurred to me that there’s a deep similarity between those tipping points and the ones we see in emerging infectious diseases,” he says, an idea that led to his proposal to the NIH to develop an early warning system for disease outbreaks.

Drake’s preliminary research suggests that patterns characteristic of an approaching tipping point can be detected in public health reports based on fluctuations in the number of cases of the disease being monitored. If public health officials are able to spot such a pattern as it happens, they might have time to prepare for an outbreak—or possibly even intervene and reverse the changes that are pushing the system toward one.

The researchers ultimately aim to produce open source computer software that will allow anyone to analyze and interpret disease surveillance data to forecast tipping points and provide the earliest possible warning of disease outbreaks.

The research is funded through a grant from the National Institutes of Health under award number 1U01GM110744-01.

Read more about Drake’s Ebola forecasting model: t.uga.edu/1aB

Learn more about Project AERO: t.uga.edu/1tS



Suzanne O’Regan, Associate Research Scientist Andrew Kramer, programmer Tomlin Pulliam, and Associate Professor Andrew Park, created a more complex model that, as Drake put it, “captures all the things we think to be most important and ignores the rest.” Those included the location of infection and treatment, the development of hospital capacity, and the adoption of safe burial practices.

prove useful in future rapid response scenarios as well, Drake says.

Meanwhile, Drake and his colleagues, including Park and Pejman Rohani, who will rejoin the Odum faculty later this year, are focused on Project AERO (Anticipating Emerging and Re-emerging Outbreaks), their MIDAS-funded work to develop mathematical models to forecast



A monarch caterpillar munching on tropical milkweed, January 2014 at The Landings in Savannah.

Photo: Dara Satterfield

Cancelled Flights

For monarch butterflies, loss of migration means more disease

Every year, millions of monarch butterflies travel from breeding grounds in the eastern U.S. and Canada to spend the winter in central Mexico. In recent years, however, their numbers have declined sharply—in 2014, the acreage occupied by overwintering monarchs in Mexico was the second-lowest ever recorded—as changing agricultural practices and land use patterns have reduced the availability of milkweed, the plant on which monarchs lay their eggs.

In response, concerned gardeners have started planting milkweed—often the exotic species *Asclepias curassavica*, or tropical milkweed, the variety most often sold by garden centers. Monarchs love it, but, according to Odum School doctoral student Dara Satterfield, it can have unintended consequences.

Tropical milkweed does not naturally die back in fall like perennial milkweeds

native to North America, and in parts of the southern U.S. from the Gulf Coast to the Atlantic it can produce foliage and flowers year-round. This allows monarchs in those areas to forego migration, stay put and keep breeding all winter. In a paper published in the *Proceedings of the Royal Society B*, Satterfield reported that these monarchs are five times more likely to be infected with parasites than migratory monarchs sampled in their summer breeding range or at overwintering sites in Mexico.

Previous research by study coauthor Sonia Altizer, Odum School associate dean and UGA Athletic Association Professor in Ecology, has shown that long distance migration can help reduce infectious disease transmission by culling sick individuals who can't survive the strenuous journey or by allowing migrating animals to move away from contaminated habitats.

Because the monarchs' winter-breeding behavior is made possible by the presence of tropical milkweed, Satterfield recommends that gardeners replace it with native milkweeds as they become available.

"If you do have tropical milkweed, we recommend cutting it back every few weeks to within six inches of the ground in fall and winter," she says. "That's especially important in coastal areas of the southern U.S. where we now know disease is a problem." She notes that some locations such as the extreme southern portions of Texas and Florida have supported tropical milkweed for many decades or longer, and there it can be left in place.

Satterfield's research received widespread media coverage, including stories in the *New York Times*, the *Washington Post*, and the journal *Science*.

Read more: t.uga.edu/1b6

Nutrient Pollution Damages Streams in Ways Previously Unknown

Excess nitrogen and phosphorus reduce an important food resource for stream life

An important food resource has been disappearing from streams without anyone noticing—until now.

In a study published in *Science*, researchers led by Odum School Associate Professor Amy Rosemond report that nutrient pollution causes a significant loss of forest-derived carbon from stream ecosystems, reducing the ability of streams to support aquatic life.

Stream food webs are based on carbon from two main sources. One is algae, which produce carbon through photosynthesis.

Nutrient pollution has long been known to increase carbon production by algae, often causing nuisance and harmful algal blooms.

The second source is leaves and bits of wood from streamside forests. This forest-derived carbon typically persists year-round, making it a staple food resource for stream organisms.

Working at the Coweeta Hydrological Laboratory, a U.S.D.A. Forest Service and National Science Foundation Long Term Ecological Research site in North Carolina,

Rosemond and her colleagues—including Odum School doctoral student David Manning, alumni Phillip Bumpers, MS '14, Jonathan Benstead, PhD '01, and John Kominoski, PhD '08, and Emeritus Professor J. Bruce Wallace—set up a system to continuously add nutrients to several small headwater streams. One experiment ran for six years in two streams, and another for three years in five streams, with different combinations of nitrogen and phosphorus to mimic the effects of different land uses.

They found that the in-stream residence time of forest-derived carbon, which provides much of the energy that fuels stream food webs, is cut in half when moderate amounts of nitrogen and phosphorus are added to a stream—reducing stream health in a way that was previously unknown.

Rosemond hopes the study's findings will be incorporated into policies aimed at reducing nutrient pollution, which currently focus on algae.

“There has been limited national progress in efforts to reduce the impact of nutrient pollution in the U.S., according to a U.S. Geological Survey study,” she says. “Our results provide a more complete picture of nutrient effects in streams, suggesting that increased efforts at addressing their impacts can now improve stream health in more than one way.”

Read more: t.uga.edu/1kB

David Manning, a UGA doctoral student, and John Kominoski, a former UGA postdoctoral researcher who is now an assistant professor at Florida International University, perform maintenance on the pump used to add nutrients to one of the streams in their experiment.

Photo: Jon Benstead/University of Alabama



NEWS BRIEFS



At the time when Audubon painted this depiction of passenger pigeons, the birds were so numerous that they were described as blackening the sky when flocks flew overhead. Overhunting and disruption of their nesting grounds drove them to extinction. In 1914, the last known passenger pigeon died at the Cincinnati Zoo.

Species Going Extinct 1,000 Times Faster Than in Pre-Human Times

Odum School Dean and UGA Foundation Professor in Ecology John Gittleman and Assistant Research Scientist Patrick Stephens are contributors to a major study that finds that species are going extinct today 1,000 times faster than during pre-human times—a rate an order of magnitude higher than the previous estimate—and that future rates are likely to be 10,000 times higher.

The study, led by Jurriaan de Vos of Brown University, appeared in *Conservation Biology* in September 2014.

The researchers were able to establish the faster current extinction rate by pinning down a more accurate pre-human rate, explaining that estimating recent rates is straightforward, but establishing the pre-human rate for comparison is not.

The current study makes use of new techniques and databases that were not available when the earlier estimate was made in 1995 by a team that included Gittleman and was led by another coauthor on the new study, Stuart Pimm of Duke University. It was based chiefly on an examination of the fossil record.

The new study incorporates the fossil record, but also uses novel analytical computer models to estimate extinction rates from phylogenetic, or evolutionary, trees—essentially maps of the genetic history of a group of organisms. In this new, more rigorous study, both sets of evidence converge on the same—lower—estimate of the normal background rate of extinction: 0.1 extinctions per million species years, meaning that one out of every 10 million species on earth became extinct each year during that time.

“Being able to look at the pre-human, or background, rate of extinction is important,” says Gittleman. “We now know that the current rate of extinction is worse than we thought because the background rate is an order of magnitude slower than the original estimate. Having a real rate of extinction will allow us to look at causal mechanisms much more carefully.”

Read more: t.uga.edu/W7

Not a win-win: Treating for worms helps animals survive infectious diseases—and spread them

Parasitic worms, which infect millions of people and animals around the world, have been shown to influence how the immune system responds to diseases like HIV and tuberculosis. In a study of African buffalo, Associate Professor Vanessa Ezenwa found that de-worming drastically improved an animal’s chances of surviving bovine tuberculosis—but with the consequence of increasing the spread of TB in the population. The findings, published in *Science* in January, have implications for human health.

Read more: t.uga.edu/1a6

Setting a dinner table for wildlife can affect their risk of disease

Supplemental feeding of wildlife can increase the spread of some infectious diseases and decrease the spread of others. A study by Odum School ecologists has found that the outcome depends on the type of pathogen and the source of food. The results, published in *Ecology Letters* in March, have implications for human health and wildlife conservation, and contain practical suggestions for wildlife disease management and a roadmap for future study.

Read more: t.uga.edu/1mR

Threatened reef-building corals have diverse symbiotic algae partners

Continued UGA research on the threatened Caribbean reef-building mountainous star coral, *Orbicella faveolata*, has found that latitudinal patterns play a key role in the type of symbiotic algae the coral associates with. The findings, recently published in *Coral Reefs*, may have implications for future management practices in the face of increasing environmental stressors. *Orbicella faveolata* is unusual in that it associates with multiple types of photosynthetic symbiotic algae depending on where it lives; *O. faveolata* corals in Florida have different species of algae than those in Belize, Mexico, and the Bahamas. “Some types (of symbiotic algae) are more susceptible to thermal stressors,” says lead author Dustin Kemp, PhD ’10. “This suggests that different corals may be affected differently by climate change.”

Read more: t.uga.edu/1vi

Odum School partners with Sewanee on wetlands research station

The Odum School has partnered with the University of the South and the Sewanee Utility Board to design a new wetlands research station in Sewanee, Tennessee. The project, which grew out of work done by students in the Environmental Practicum service learning graduate course led by Laurie Fowler, Odum School associate dean and River Basin Center director of policy, is funded by a grant from the Coca-Cola Foundation and the Coca-Cola Bottling Company UNITED, Inc.

The project will serve to demonstrate the ability of human-made wetlands to remove emerging contaminants from treated wastewater. It is a cost-effective technology that can treat up to 100,000 gallons of water daily.

Read more: rivercenter.uga.edu

WiSci: Women in Science

New organization promotes equality in the sciences

Concerned about retaining and advancing women in science and technology careers, a group of Odum School graduate students have formed an organization to promote equality in the sciences. Since its initial meeting in November, Women in Science—WiSci for short—which is open to the entire UGA community regardless of gender, has instituted a mentoring program and hosted a variety of career development and networking events. WiSci received a \$5,000 grant from the UGA Parents and Families Association to support professional development and outreach events, and in April was named Outstanding New Organization at the UGA Student Organization Achievement and Recognition Awards ceremony.



In March 2015, Meg Lowman, American biologist, educator, ecologist, writer, explorer, and public speaker gave a seminar at the Odum School, Plant-Insect Interactions in Tropical Rain Forest Canopies. Photo: Carlton Ward Jr.

A Conversation with Meg Lowman

By Laura Early, MS CESD student

In March, WiSci hosted an open discussion about women in science with pioneering canopy ecologist Meg Lowman during her visit to the Odum School.

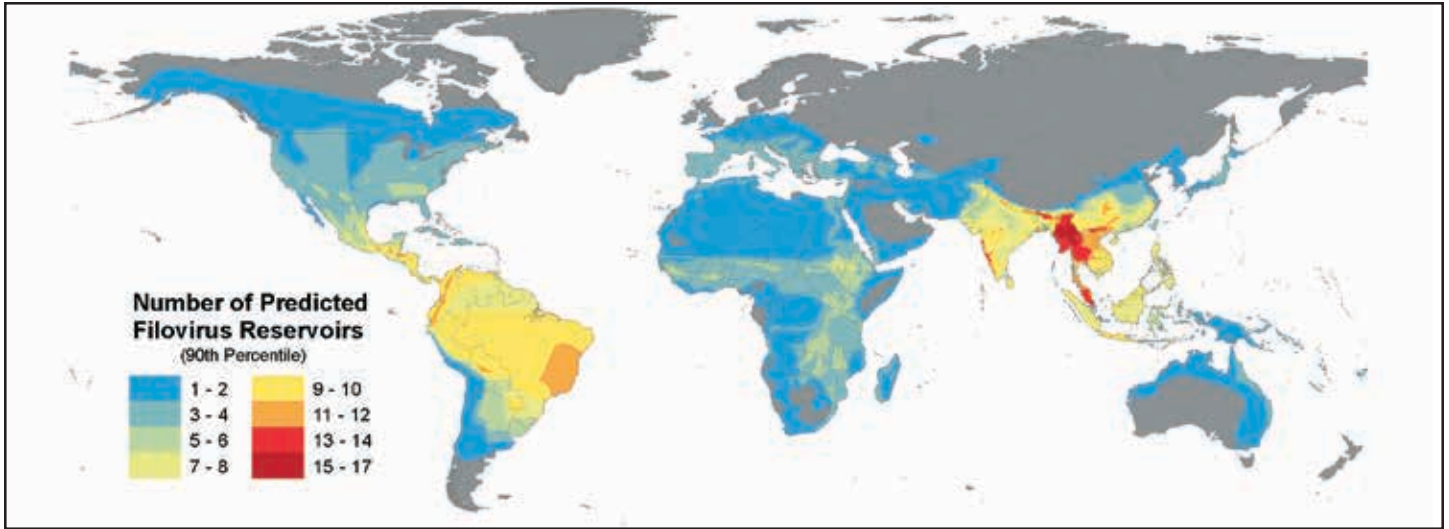
Dr. Lowman's career has taken her from Massachusetts to Australia to Chief of Science and Sustainability at the California Academy of Sciences, with many adventures in between. As she chatted with a room full of people eager to learn how to solve gender inequality issues in science, she admitted to not having all the answers, but she had valuable experiences to share.

After completing her Ph.D. at Sydney University, she started a family with a sheep farmer in the Outback and was immersed in a culture that did not approve of women having careers outside of the home. However, unable to stray from her science, she found herself heading into the canopy with two kids in tow. Speaking to the challenges women often face in balancing family and careers, she said, don't forget that children make the best field assistants!

Children also make a great audience for practicing the delivery of your scientific message. Being able to convey a concept to a middle school student is an ideal way to capture interest and communicate science effectively to a broader audience. In addition, she urged us to think about the relevance of our research. In light of the environmental state of the planet, we "need to do the most relevant things we can," she said.

We need both genders to make change, Dr. Lowman said, and it's urgent that we make change. In her current position at the California Academy of Sciences, Dr. Lowman has a staff of over 50 scientists, of whom only a handful are women. In other countries this disproportionality is much more pronounced. We need to raise men and women to accept and support all genders in the sciences, she said.

In response to a question from Ecology professor Richard Hall, Dr. Lowman said one of the most valuable things for male mentors to do for their female mentees is to be flexible and supportive of different work styles and schedules, in particular in accommodating family life. However, female scientists supporting each other, both in our local workplaces and across the world, is a key component to achieving gender equality and having the best scientists working together to address the most pressing environmental questions.



During one of over 30 presentations, former Odum School postdoctoral researcher Barbara Han, now at the Cary Institute of Ecosystem Studies, spoke in depth on the unidentified reservoirs of filoviruses in the wild. The above slide shows the global distribution of candidate reservoirs for intra- and inter-species transmission of diseases.

UGA Hosts International Conference on Ecology, Evolution of Infectious Diseases

More than 350 scientists from around the world gathered in Athens in May 2015 when the University of Georgia hosted the 13th annual Conference on the Ecology and Evolution of Infectious Diseases.

The conference brought together experts from more than 100 institutions to share research findings and discuss issues related to the spread and evolution of infectious diseases. Participants explored both small- and large-scale mechanisms that underlie infectious disease spread and emergence and pathogen impacts on humans, agriculture and natural ecosystems.

“Research on the ecology of infectious diseases has never been as relevant as it is today, in part because human changes to the environment are affecting the ecology of pathogens like never before,” says conference co-chair Sonia Altizer, associate dean and UGA Athletic Association Professor in Ecology in the Odum School. “Most people think of diseases as problems for medicine to solve, but there’s growing awareness that an ecological understanding of pathogens can inform strategies to predict, control and prevent infectious diseases.”

This year’s EEID conference high-

lighted the connections between infectious disease ecology and other fields.

Conference co-chair Andrew Park, associate professor in the Odum School and the College of Veterinary Medicine’s infectious diseases department, says the theme was particularly apt for UGA, with more than 100 faculty members engaged in the study of infectious diseases across campus.

“The strength of the infectious disease faculty here is unprecedented, and part of that is the linking across schools and departments,” he says. “Traditional disciplinary boundaries are far less apparent at UGA.”

The conference opened with a welcome from Dean John Gittleman. Session themes included the dynamics of neglected tropical diseases, the interface between infectious diseases and the social sciences, within-host processes and evolution and the macroecology of infectious diseases.

In addition to conference talks and poster presentations, the 2015 EEID meeting featured a lunch session on careers in disease ecology, designed to give students and postdoctoral scholars the opportunity to meet and ask questions of researchers and professionals in areas beyond academia, such as science communication and government agencies.

The EEID conference was sponsored by

a number of units at UGA, including the Office of the Vice President for Research, the College of Public Health, the Odum School of Ecology, the College of Veterinary Medicine, the Biomedical and Health Sciences Institute, the Center for Tropical and Emerging Global Diseases, the Faculty of Infectious Diseases, One Health at UGA and the President’s Venture Fund through the generous gifts of the University of Georgia Partners, as well as Emory University, Georgia Tech and the National Science Foundation.

In addition to Altizer and Park, the conference steering committee included UGA faculty members John Drake in the Odum School; Vanessa Ezenwa, Richard Hall, and Courtney Murdock in the Odum School and College of Veterinary Medicine; Nicole Gottdenker, PhD ‘09, in the College of Veterinary Medicine; Andreas Handel in the College of Public Health; Dan Colley in the Center for Tropical and Emerging Global Diseases; Emory University faculty members Jaap de Roode in the biology department and Uriel Kitron in the environmental studies department; and Joshua Weitz in the School of Biology at Georgia Tech. Odum School doctoral student Alexa Fritzsche McKay provided assistance to the organizers.

Watershed UGA

Creating a university-wide culture of sustainability around our campus streams



Graduate students Matt Carroll and Shannon Bonney sampling for stream life in Lilly Branch near the Lamar Dodd School of Art building on the UGA campus.

UGA's campus waterways suffer from many of the ills typical of urban watersheds. Lilly Branch and Tanyard Creek experience excessive stormwater runoff that carries oil and other pollutants from roads and parking lots, eroding banks, an influx of invasive species, and bacteria from leaking sewer pipes and pet waste. Lake Herrick, where students used to swim and paddle, has been closed because of pollution for years.

Watershed UGA aims to change all that while providing a transformative, hands-on experience in sustainability. The goal is that all UGA students will learn about—

and have the chance to help restore—campus waterways through teaching, research, public service and outreach and campus physical operations.

“We have a tremendous opportunity to engage the campus community in sustainability through campus watersheds, expanding experiential learning opportunities and fostering a sense of place among faculty, staff and students at UGA,” says Tyra Byers, program coordinator in the UGA Office of Sustainability.

A new multidisciplinary initiative spearheaded by the Odum School and the Office of Sustainability, with funding from

the Ray C. Anderson Foundation, Watershed UGA builds on existing partnerships between UGA and Athens-Clarke County.

For the past several years, UGA students have been studying campus waterways through courses in areas including ecology, public health, hydrology, environmental law, and landscape architecture. Students in the multidisciplinary Environmental Practicum, led by Odum School associate dean Laurie Fowler, and other courses worked with county officials to develop a restoration plan, and students and staff across campus have

helped to implement some of its recommendations. These include innovative projects like using goats and sheep—the “Chew Crew”—in invasive plant control and constructing attractive rain gardens to manage stormwater in critical locations. And UGA students have been working with elementary school classes within the watersheds to provide age-appropriate environmental service learning education.

Watershed UGA will scale up all these efforts, bringing the restoration of campus waterways to the entire campus community through classrooms, housing communities and research and service activities.

Phase one of the initiative got underway at two standing-room only faculty workshops in April, where new Watershed UGA course modules were introduced. The modules, developed by graduate students in upper level ecology and landscape architecture courses with the help of graduate assistants in the UGA Center for the Integration of Research, Teaching and Learning, are designed to help faculty incorporate sustainability into their curriculum in classes ranging from biology to art.

Watershed UGA will pick up steam this fall, with a kickoff celebration, the introduction of more service learning activities, and the launch of the campus life component of the project, including a social media campaign, inter-dorm competitions and other events.

Watershed UGA is a partnership between the Odum School of Ecology, the Office of Sustainability, the Vice President for Public Service and Outreach, the Center for Teaching and Learning, the Center for the Integration of Research, Teaching and Learning, the Franklin College of Arts and Sciences, the College of Agricultural and Environmental Sciences, the College of Education, the College of Engineering, the College of Environment and Design, the Warnell School of Forestry and Natural Resources, the School of Law, the College of Public Health, the Graduate School, the Facilities Management Division, the Office of Service-Learning, the Office of the University Architects for Facilities Planning, University Housing, and Athens-Clarke County.

Learn more: www.watersheduga.edu

Odum School Introduces New Bachelor of Arts Degree in Ecology

Starting this fall, UGA undergraduates interested in ecology will have a new academic option, as the Odum School launches a Bachelor of Arts in ecology degree.

Designed to meet the needs of students interested in the interface of ecology and society, the Bachelor of Arts will build on the strong foundation of the existing Bachelor of Science degree but will take a more interdisciplinary approach. The program will emphasize the development of problem solving and communication skills through experiential learning focused on ecological principles and environmental issues in their social context.

Dean John Gittleman says the Bachelor of Arts in ecology is an idea whose time has come, driven by demand from both students and employers.

“Our Bachelor of Science degree provides excellent preparation for those who want to pursue careers as scientists—our students go on to highly competitive graduate programs and successful careers with NGOs, governmental agencies, and consulting firms,” says Gittleman. “That won’t change. But more and more, we are being approached by students interested in fields like environmental law, science journalism, and sustainability. At the same time, we have been hearing from business leaders about the growing need for professionals who understand ecological principles and can translate the science into real-world solutions for the very complex problems they face. This Bachelor of Arts degree program is intended to fill that gap.”

Students in the Bachelor of Arts program will receive a strong foundation in ecological science, taking many of the same core courses as those seeking the Bachelor of Science degree. These include 21 hours of major level ecology classes and 12 hours of science and math.

Other classes will emphasize the development of problem solving and communication skills through experiential learning. An innovative field course will take Bachelor of Arts students on a tour of Georgia to gain first-hand experience of the environmental issues facing the state and meet the stakeholders involved. A practicum course, modeled on the graduate level Environmental Practicum, will provide them with the opportunity to gain experience in group problem solving while putting what they’ve learned into practice.

“Environmental issues are increasingly recognized as affecting not just the environment itself, but human health, the economy, and global security,” says Gittleman. “The Odum School’s new Bachelor of Arts in ecology program will give students the tools they need to become leaders in addressing these twenty-first century challenges.”

For more information about the Bachelor of Arts in ecology degree, please contact Odum School undergraduate advisor Misha Boyd at mlboyd@uga.edu, or Carol Hoffman at hoffman@uga.edu.

Learn more: t.uga.edu/1Bx



Erin Foster Abernethy, MS '15

Q&A

Share a little bit about your time working on the influence of invasive species in Hawaii.

I spent two summers researching the role of invasive species as carcasses and as scavengers in Hawaii. To explore the impact of invasive species on the ecosystem process of scavenging, I monitored the carcasses of invasive species—frogs, lizards, rats, birds and mongooses—placed in the rainforests and lava fields of Hawaii. My goal was to find out what eats carcasses on Hawaii, an area lacking native scavengers.

While insects did eat a large portion of the carcasses, I discovered that a surprisingly high proportion was taken by other invasives, primarily mongooses and rats. I discovered that invasive animals acted as scavengers using the carcasses of other invasives and sometimes even ate the carcasses of their own species.

How did that experience fit into your academic interests or major? How did a UGA faculty member help you with it?

I am interested in how human actions, such as introducing invasive species, impact natural ecosystem processes, like scavenging. This research project enabled me to determine how invasive species were altering the ecosystem process of scavenging—plus, I got to work in paradise for two summers. Dr. Olin E. (Gene) Rhodes Jr., my adviser and director of the Savannah River Ecology Lab, brought me on to complete this project and was instrumental in its design. After the initial design, Dr. Rhodes continued to offer advice but allowed me great independence throughout the process.

How did that experience help clarify your future plans?

I've always enjoyed conducting scientific research, and this project solidified research as my career choice. My future research will focus on an intentional

This profile of Erin Abernethy originally appeared on the 2015 UGA Commencement web site as part of the "15 from 2015" feature at commencement.uga.edu/2015.

Photo: Peter Frey

human modification of the environment: dams. Dams are widespread throughout the U.S. and alter stream flow, which impacts aquatic insects. I will evaluate whether dams have fundamentally changed how, when and where aquatic insects choose to mate.

What were the benefits of doing that research in Hawaii?

While there are many life skills to be learned from living in Hawaii—how to open a coconut, surf, cliff jump, avoid lava cracks—the most valuable skill I learned was how to get a large-scale research project off the ground and completed in a remote location. I also returned to the Savannah River Ecology Lab and processed the hundreds of thousands of photos taken by the motion sensor cameras. That was a lesson in patience and large data management. I have grown as a scientist and communicator. It takes creativity to convince folks that a dead frog is interesting and has an important part to play in ecosystems.

How did that experience change you?

I think more critically about the problem at hand and deliberate consciously on how I should discuss an issue with others. Learning how to communicate and collaborate with diverse organizations is a critical skill that I have been able to develop during my time at SREL and Odum.

What are your plans after graduation?

I will be working on a doctorate in integrative biology at Oregon State University.



Tim Montgomery, BS '15

Learning to Love the Mud

If you're a marine ecologist, you've got to learn to love the mud," says Tim Montgomery—and he should know. Montgomery, who graduated cum laude in May with a bachelor's degree in ecology and interdisciplinary studies in marine sciences, found himself almost up to his neck in the stuff—literally—two summers ago. At the time he was collecting research samples in a salt marsh on St. Simons Island. "That was intense," he says. "I definitely don't want to do it again, but it was fun." (He got his samples too.)

Growing up on a farm in Statesboro, Montgomery always enjoyed the outdoors, particularly hunting and fishing with his

father. It was his love of fishing and being out on the ocean that first interested him in marine ecology.

When he arrived at UGA after two years at Young Harris College, he planned to major in marine sciences. At the suggestion of a friend, however, he visited the nearby ecology building. "I met [undergraduate advisor] Misha Boyd, and she introduced me to Jeb Byers," he says. "Within an hour, I was completely sold. I knew this was exactly the program I was looking for."

The Odum School's small size was part of the appeal. "Odum has been amazing," he says. "It's one of the

reasons I've really enjoyed being at UGA. It has the feel of a small college, which I love; everyone is so approachable. It's the best college on campus, there's no doubt about that!"

Montgomery spent his first summer as an ecology student as a general technician intern at the Georgia Coastal Ecosystems Long Term Ecological Research site on Sapelo Island, his first experience working on the coast. Besides getting into the mud, he did everything from repairing boardwalks to plant and insect identification, helping with whatever research was being done.

Back in Athens, he worked in Amy Rosemond's lab ("You also get mud in limnology; it's pretty fun too," he says) before participating in a Research Experience for Undergraduates program with Byers on Skidaway Island the following summer. He worked with doctoral student Linsey Hiram studying *Gracilaria vermiculophylla*, an invasive seaweed native to Japan that has recently appeared on the southeastern coast of the U.S.

"I looked at whether herbivores were consuming *gracilaria*," he says. "Since it's a red alga it has really strong chemical defenses, and not a lot of things can tackle it without having adapted to it. So we found, as predicted, that nothing's eating it because nothing's adapted to it yet—except an invasive isopod that's from the same region the *gracilaria* is. It's had time to adapt where native herbivores haven't."

Tim's research resulted in a an honors thesis, "*Gracilaria vermiculophylla*'s Impacts on Herbivory in Georgia's Coastal Ecosystems," that won the award for best paper in the physical and environmental sciences category at the 2015 UGA Center for Undergraduate Research Opportunities Symposium.

After graduation, Tim plans to gain more research experience before applying for doctoral programs. "I want to keep doing marine ecology," he says. "I'm interested in community dynamics as well as invasive ecology, so I think I'd really love looking at how invasive species affect community structure, or something along those lines."

Just as long as it involves getting out into the mud, that is.



Nancy Grimm, professor of ecology in the School of Life Sciences and senior sustainability scientist in the Julie Ann Wrigley Global Institute of Sustainability at Arizona State University, gave the 2015 Odum Lecture.

The Only Certainty Is Change

Reflections on a stream, a city, and a public university

The first time Nancy Grimm gave a talk in the Ecology auditorium, Eugene Odum was in the audience.

“At the end of my lecture, his hand went up and he asked a difficult question—of course!” she told the crowd gathered for the 30th annual Odum Lecture on April 21. “It was really a wonderful time. I knew Gene Odum and I’m very honored to be able to deliver this lecture today.”

At the University of Arizona, Grimm studies how climate change and human activities affect ecological processes in aquatic and urban ecosystems. Her ongoing research includes studies of the flow of nutrients through urban stormwater systems, the ecosystem services stormwater infrastructure provides, and how climate change and variability impact the response of streams to disturbances like floods and droughts.

Much of her research has been done at the Central Arizona–Phoenix Long-Term Ecological Research project, one of the few sites in the National Science Foundation-funded LTER system focused on urban ecosystems. Grimm has directed the interdisciplinary CAP LTER since its founding in 1997, collaborating with engineers, hydrologists, anthropologists, geographers, and others to explore how changing urban ecosystems affect human outcomes and how human behavior in turn alters ecosystem structure, function, and sustainability.

Grimm drew upon that experience, and her more than three decades of research on the impacts of hydrologic variability and heterogeneity on ecosystem structure and function in desert streams, to explain how her thinking about ecosystems

has evolved, and to emphasize the importance of an interdisciplinary approach to responding to ecosystem change.

Grimm highlighted three key points in her talk: Change is ubiquitous in many ecosystems in this era of human domination; an ecosystem approach is appropriate for understanding these systems; and ecologists belong in the fray on effecting transformational change along a sustainability trajectory.

“Climate variability and change, which drives hydrologic variability and extreme events, is having and will continue to have profound influences on streams and cities,” she said, adding that most people will experience climate change in the form of extreme events.

“I’ve been thinking about these issues and how we can blend ideas from ecology and engineering,” she said. “We need design that incorporates ecosystem principles so we can deal with the increasing frequency and magnitude of events.

“We have choices,” she concluded. “We can help, as ecosystem ecologists, bend the trajectories for society toward more desirable outcomes. I believe ecologists need to be at the table to help in that effort.”

Grimm is a Fellow of the American Association for the Advancement of Science; a Fellow and past president of the Ecological Society of America; and a past president of the Society for Freshwater Science, formerly the North American Benthological Society. She is a recipient of the Director’s Award for Collaborative Integration from the National Science Foundation. The author or coauthor of more than 160 scientific papers, she was also lead author of two chapters in the U.S. Global Change Research Program’s National Climate Assessment released in 2014.

1970s

The 2015 Greater Everglades Ecosystem Restoration Conference is dedicated to **Ronnie Best**, PhD '76, in recognition of his visionary guidance and contributions to wetlands science and the Everglades. Ronnie retired from the U.S.G.S. in 2014 after nearly 20 years, following a distinguished career on the faculty of the University of Florida. For more about Ronnie's accomplishments, see bit.ly/1Nv2XiU.

Christopher Francis D'Elia, PhD '74, was honored by the University of Georgia Graduate School as one ten 2014 Alumni of Distinction in a ceremony on Oct. 16 in Athens. D'Elia, of Baton Rouge, Louisiana, is the dean of the School of the Coast and Environment at Louisiana State University. His research is centered on the nutrient dynamics of estuaries and coral reefs. D'Elia is a Fellow of the American Association for the Advancement of Science, has served on numerous advisory panels to the National Science Foundation, and previously directed the International Ocean Institute-USA and the Center for Science and Policy Applications for the Coastal Environment.

Congratulations to **Jack Webster**, PhD '75, who was honored with the title Professor Emeritus upon his retirement from Virginia Tech in 2015. For more about Jack's long and distinguished career, see bit.ly/1Ici6Gh.

1980s



Jon Ambrose
Photo: Georgia DNR

Jon Ambrose, PhD '86, was named chief of the Nongame Conservation Section of the Georgia Department of Natural Resources Wildlife Resources Division in July 2014, where he oversees the agency responsible for conserving Georgia's rare and other nongame wildlife, native plants, and their natural habitats. Jon coordinated Georgia's first State Wildlife Action Plan and now chairs the Southeastern Association of Fish and Wildlife Agencies' Wildlife Action Plans Committee. Learn more at georgiawildlife.com/node/3683



Pictured are (l-r): Julie Coffield, interim graduate school dean; Terry Hunt, chair of the Graduate Education Advancement Board; Kurt C. Lawrence; Phillip J. Brantley; Pamela Flattau; Roland McElroy; Pamela Whitten, senior vice president for academic affairs and provost; (second row) Michael Feuerstein; Perry W. Buffington; Richard F. Arrendale; and **Christopher Francis D'Elia**. Photo: UGA.

The UGA Graduate School honored 10 graduates with the 2014 Alumni of Distinction Award for achieving exceptional success in their professional careers and in service to their communities.

Peter Groffman, PhD '84, was named a Fellow of the Ecological Society of America in 2015. He is a microbial ecologist at the Cary Institute of Ecosystem Studies in Millbrook, New York. His research focuses on the role that microorganisms play in ecosystem functions related to nutrient cycling, water and air quality and soil carbon storage and the environmental regulation of microbes.

1990s

Katherine Baer, MS CESD '96, joined River Network, a national nonprofit dedicated to helping local organizations protect and restore their rivers and watersheds, as director of Science and Policy in April 2015. She was previously the director of Conservation for the Triangle Land Conservancy in Durham, North Carolina. For more about River Network, see www.rivernetwork.org.

Evelyn Gaiser, PhD '97, was appointed executive director of the School of Environment, Arts and Society and associate dean in the College of Arts and Sciences at Florida International University in 2015. She previously served as the interim executive director of SEAS, helping advance key initiatives including the launch of the International Center for Tropical Botany and a new partnership with the Florida Keys National Marine Sanctuary. Evelyn was interviewed about sea level rise, the



Evelyn Gaiser
Photo: Florida International University

Everglades, and other environmental issues by National Public Radio, the Washington Post, and other major media outlets on Earth Day 2015. She has been the Lead Principal Investigator of the Florida Coastal Everglades Long-Term Ecological Research Program since 2007. Her research focuses on algal community structure in lakes and wetlands.

Alice Miller Keyes, MS CESD '99, was named associate director of 100 Miles, a nonprofit organization dedicated to the conservation of the Georgia coast, in 2014. She was previously a program officer for the R. Howard Dobbs, Jr. Foundation, a policy advisor to the director of the State of Georgia Environmental Protection Division, and director of Water Resource Programs at the Georgia Conservancy. Learn about 100 Miles at www.onehundredmiles.org.



Beth Shapiro, BS/MS '95.
Published in 2015.
Princeton University Press.

2000s

Carla Atkinson, MS '08, received the 2015 Hynes Award for New Investigators from the Society of Freshwater Science. Carla, who received her doctorate from the University of Oklahoma in 2013, is now an Assistant Professor in the Department of Biological Sciences at the University of Alabama. A community and ecosystem ecologist, she is interested in how species traits maintain essential ecosystem functions and how land use and climate change may interact to impact a species' role and its survival within the ecosystem. Her research has focused on the importance of species traits on ecosystem processes; effects of species loss on ecosystem function, i.e. nutrient cycling and storage; and the consequences of land use change on aquatic ecosystems. She is the third UGA Ecology graduate to receive the prize since it was introduced in 2000. The others are **Robert O. Hall Jr.**, PhD '96, and **John Davis**, PhD '09.

Sara Beresford, MS CESD '00, became the Education and Public Outreach Lead for ECOGIG in 2015, based in the laboratory of Samantha Joye in the UGA Department of Marine Sciences. ECOGIG (Ecosystem Impacts of Oil and Gas Inputs to the Gulf) is one of eight research consortia awarded funds by the Gulf of Mexico Research Initiative, a 20-member independent research board created to allocate the \$500 million committed by BP for independent research programs following the April 20, 2010, Macondo well blowout. The ECOGIG consortium brings together physical oceanographers, marine biologists, and chemists from 14 research institutions and is headed by Joye. For more information, see <http://ecogig.org>.

Eva Buckner, MS '09, received her doctorate in entomology from the University of Florida in 2014. Her dissertation research was on the larval environment and vector competence of *Aedes aegypti* and *Aedes albopictus* mosquitoes for dengue-1 virus. She is now a postdoctoral research associate in the Medical Entomology Laboratory at the Illinois Natural History Survey, University of Illinois in Urbana-Champaign, where she is conducting research on the ecology of mosquito-borne arboviruses, particularly dengue virus.

Timothy Carter, PhD '06, was named President and CEO of Second Nature, the umbrella organization supporting the American College and University Presidents' Climate Commitment, a network of over 680 institutions of higher education committed to sustainability and climate preparedness, in September 2014. He was previously the founding director of the Center for Urban Ecology at Butler University. For more about Second Nature, see www.secondnature.org.

Rachel Rarick, BS '07, works at Springmont, a Montessori school in Sandy Springs, Georgia, and is currently in training to become an elementary Montessori teacher. She previously worked at Emory University, Jekyll Island 4H, and the Hike Inn at Amicalola Falls.

Kelly Sands, MS CESD '08, joined Westervelt Ecological Services in June 2015 as Business Development Representative in northwest Florida. Westervelt Ecological Services creates mitigation banks and provides environmental mitigation and habitat planning services to landowners, businesses, government agencies, and land trusts.

John R. Schramski, PhD '06, an associate professor in the UGA College of Engineering, was lead author on a paper, "Metabolic theory predicts whole-ecosystem properties," published in *Proceedings of the National Academy of Sciences* in 2014.

Theresa Thom, MS CESD '00/PhD '05, recently accepted a new position with the National Park Service at Lake Mead National Recreation Area in Boulder City, Nevada.

2010s



Emily Cornelius, MS '13, is pursuing a doctorate in the Forest and Wildlife Ecology program at the University of Wisconsin-Madison in Dr. William Karasov's lab. Her dissertation research will examine the immune function

of wild birds and its response to variation in resource availability. She will primarily be working with Black-capped chickadees and conducting studies to assess their viability as a competent reservoir for West Nile Virus.

Tyler Kartzinell, PhD '12, is a postdoctoral associate at Princeton University. He was lead author on a paper, "DNA metabarcoding illuminates dietary niche partitioning by African large herbivores," published in *Proceedings of the National Academy of Sciences* in 2015. His research is the subject of the video "Gorongosa Field Notes: Going Back in Time Four Decades," part of a series produced by the E.O. Wilson Biodiversity Foundation. To view the video, see bit.ly/1C8aCBU.

In Memoriam

The Odum School community was saddened by the death of **Ken Leonard**, PhD '10, on July 20, 2014. Ken entered the graduate program after a career in the U.S. Navy and then as an IT professional in the private sector, bringing a unique perspective and dedication to the study of ecology. His dissertation, "Delineating the ecological niche to predict competitive outcomes and the influence of evolution," involved the creation of a new model to analyze the evolution of populations' responses to changing resource availability. His doctoral advisor Mark Bradford, now at Yale University, has overseen the preparation of a paper based on Ken's data and model that is to be published in the *Proceedings of the Royal Society B* (for details, see In Print, page 28.) His survivors include Anna, his wife of 48 years; son **Norman Leonard**, BS '98, daughter Stephanie M. Higdon; his mother Billie June, two sisters, and five grandchildren.

Megan Machmuller, PhD '14, was featured on the Nov. 24, 2014 episode of the PBS program NewsHour. The segment covers climate change research in Alaska conducted by Megan and colleagues from Colorado State University, where she is currently a postdoctoral fellow. Watch the video at to.pbs.org/1tfHwHY.

Meredith Meyers, PhD '13, is the lab coordinator for the San Diego Coastkeeper, a nonprofit organization working to protect and restore fishable, swimmable and drinkable waters in San Diego County. Learn more at www.sdcoastkeeper.org.

Todd Pierson, BS '13, received a 2015 Graduate Research Fellowship from the National Science Foundation. Todd is a doctoral student in evolutionary biology at the University of Tennessee Knoxville, where he is

continuing his research on salamanders. In September 2014, Todd received a National Geographic Young Explorers Grant—his second—to support research in the southern Appalachians, where he is working to develop an environmental DNA assay for aquatic plethodontid (lungless) salamanders. The new assay will make it possible to characterize entire amphibian communities from just a sample of stream water.

Malavika Rajeev, BS/MS '13, received a 2015 Graduate Research Fellowship from the National Science Foundation. She will pursue her doctorate in Ecology and Evolutionary Biology at Princeton, where she will work with Jessica Metcalf.

Kathleen Raven, MS '12, who also has a master's degree in Health and Medical Journalism from the UGA Grady College of Journalism and Mass Communication, joined the Yale School of Medicine as the Associate Editor of Publications in the Office of Institutional Planning and Communications.



Virginia Schutte, PhD '14, and her husband Charles welcomed new baby Elden Louis Schutte on March 16, 2015. The Schuttes are currently living in Bremen, Germany, where Charles (PhD Marine Sciences) is a postdoctoral researcher at the Max Planck Institute for Marine Microbiology and Virginia is pursuing her interest in communicating science to the general public. You can follow her blog at the University of Rhode Island's Oceanbites site at <http://oceanbites.org/author/vschutte/>.

Theresa Stratmann, BS '13, has entered a doctoral program in movement ecology at the Goethe Universität in Frankfurt, Germany, where she will work on a modeling project looking at Mongolian gazelles. Theresa received her master's degree from Clemson University in April 2014.

Strickland '09 Headlines GSS



Michael Strickland, PhD '09, gave the keynote address at the 21st annual Graduate Student Symposium in January 2015. Currently an assistant professor in the biological sciences department at Virginia Tech, he did his postdoctoral

research at Yale University. He received the UGA Graduate Student Excellence in Research Award in the Life Sciences in 2010.

In "Links Between Soil Microbial Communities, Environmental Change, and... Human Health," Strickland discussed his research examining the response of soil microbial communities to land use change, and how such change may lead to an increase in the prevalence of antibiotic resistant genes in soil microbial communities. His talk illustrated a conceptual linkage between land-use change, antibiotic resistance in soil microbial communities, ecosystem processes, and human health.

Strickland's talk capped two days of oral presentations by 35 Odum School graduate students and poster presentations by 12 undergraduates. Awards were given for best poster and best presentations. GSS 2015 was organized by Katie Brownson and Elise Krueger.

PROPOSED RESEARCH

1ST PLACE

Rachel Smith, Structuring life on the edge: Do ecosystem engineers facilitate their own range expansions?

MASTER'S RESEARCH

1ST PLACE

Erin Coughlin, Investigating ecological implications of American chestnut restoration by understanding plant-soil feedbacks

2ND PLACE

Caitlin Rumrill, Chronic effects of larval exposure to multiple stressors in southern toads, *Anaxyrus terrestris*

DOCTORAL RESEARCH

1ST PLACE

Carly Phillips, Plant-soil feedbacks impact arctic soil carbon storage

2ND PLACE

Elizabeth Hamman, Spatial distribution of coral damage affects coral tissue regeneration, skeletal growth and morphology

3RD PLACE

Alyssa Gehman, Mortality across a range of temperatures and multiple stages of rhizocephalan infection

4TH PLACE (TIE)

Tad Dallas, When is competition friendly? The influence of competition on infection dynamics

Ania Majewska,

Attraction vs. production of butterflies in planted gardens

UNDERGRADUATE POSTERS

1ST PLACE

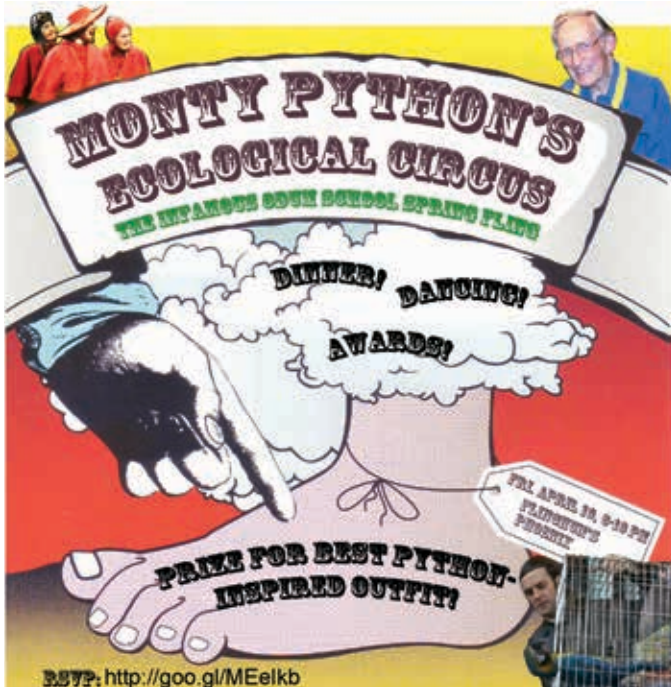
Emilie Morris, The parasite's perspective: Pathogen virulence in relation to host energy allocation in the monarch butterfly

2ND PLACE

Malcolm Barnard, Utilization of *Spirogyra grevilleana* as a method of algal filtration for reduction of limnetic nutrient and *Escherichia coli* levels

3RD PLACE

Stuart Sims, Investigating the effectiveness of pollinator gardens as a conservation strategy



Ministry of Silly Walks



Costume contest participants

This year the Odum School's annual celebration and awards ceremony featured a motley cast of Monty Python characters, including the Ministry of Silly Walks, a dead parrot, Tim the Enchanter, two killer rabbits, a Knight Who Says Ni and a shrubbery, a fish slapping dancer, the Hell's Grannies, and the Spanish Inquisition (nobody was expecting them!) King Arthur and his horse, aka Carrie Keogh and Katie Worsley-Tonks, won the costume competition and Cecilia Sánchez was named Chief Minister after a thrilling and extremely silly walk-off.

ODUM SCHOOL OF ECOLOGY AWARDS

BEST STUDENT PAPER: APPLIED

Dara Satterfield

BEST STUDENT PAPER: BASIC/THEORETICAL

Daniel Becker

RON CARROLL AND CAROL HOFFMAN

COSTA RICA TRAVEL AWARD

Tyler Ellison, Kylie Isaack, and Kelsey Morton

DEAN'S AWARD

Carol Hoffman

DISTINGUISHED GRADUATE

STUDENT TEACHING AWARD

Jenna Malek

EMPLOYEE OF THE YEAR AWARD

Brenda Mattox

EXCELLENCE IN OUTREACH

Jessica Chappell and John Vinson

FACULTY INSTRUCTOR OF THE YEAR

Elizabeth King

FRANK GOLLEY MEMORIAL AWARD

Kaitlin Farrell

GRADUATE DIVERSITY AWARD

Cecilia Sánchez

JOSH LAERM MEMORIAL

OUTSTANDING ECOLOGY

UNDERGRADUATE AWARD

David Stoker

JUDY MEYER-GENE HELFMAN

GRADUATE TRAVEL AWARD

David Manning

ODUM SCHOOL FACULTY/STAFF

STUDENT SUPPORT AWARD

David Diaz

PURPLE HEART AWARD

Beth Gavrilles

THELMA RICHARDSON AND FRANK GOLLEY

UNDERGRADUATE SUPPORT AWARD

Erin Kelly and James Workman

ROBERT A. SHELDON MEMORIAL AWARD

Cara Love



BECKER AND ADAMS



MALEK AND ADAMS



VINSON AND CHAPPELL



GITTLEMAN AND MATTOX



MANNING AND MANNING



Craig Osenberg

Professor Craig Osenberg joined the Odum School faculty in 2014. He received his doctorate from Michigan State University and came to the Odum School after 19 years on faculty at the University of Florida, where he also served as chair of the Department of Biology. His research interests include marine and freshwater ecology, population ecology, community ecology, and theoretical ecology. His current projects include the study of coral reef dynamics; effects of habitat quality and spatial distribution on fish dynamics; design and efficacy of marine protected areas; analysis of large-scale perturbations using BACIPS designs; soil carbon dynamics; and the application of meta-analysis in ecology. Craig was elected a Fellow of the Ecological Society of America in 2015, and has served as the Chair of the ESA Aquatic Section, Editor-in-Chief of *Oecologia*, and on the editorial boards of *Ecology*, *Ecological Monographs*, and *Frontiers in Marine Science*. He has served as a consultant to a diversity of groups applying science to important environmental issues, including human impacts in marine systems, the design and assessment of marine protected areas in Costa Rica and the Mediterranean, and restoration of the Everglades and the Gulf of Mexico. Learn more about Craig at t.uga.edu/1y7.

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Jill Anderson

Assistant Professor Jill Anderson joined the Odum School in 2015, with a joint appointment in the Department of Genetics. Her research focuses on adaptive evolution in natural plant populations, using approaches drawn from ecophysiology, population and quantitative genetics, and ecological genomics to investigate the ecological and evolutionary dynamics of plants. Current projects include a study of the evolutionary consequences of climate change using a species of mustard, *Boechnera stricta*, native to the Rocky Mountains; an analysis of demographic source-sink dynamics in Elliott's blueberry, *Vaccinium elliotii*; and a study of seed dispersal by fruit-eating fishes, conducted in the Brazilian Pantanal and the Colombian Amazon. Jill, who received her doctorate from Cornell University, came to UGA from the University of South Carolina, where she was an assistant professor in the Department of Biological Sciences and Environment and Sustainability Program. She did her postdoctoral research at Duke University. Learn more about Jill at t.uga.edu/1ya.

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Courtney Murdock

Assistant Professor Courtney Murdock, who has a joint appointment in the College of Veterinary Medicine Department of Infectious Diseases, joined the Odum School in 2014. She studies the role of the environment in vector-borne disease transmission, with a research program that incorporates field work, laboratory experiments, and modeling. Working with *Anopheles* mosquitoes and *Plasmodium*, the malaria parasite, she is exploring the effects of temperature on mosquito immunity; how environment and body condition affect the mosquito's vectorial capacity; and the effects of environmental factors on mosquito control. She is also studying *Aedes albopictus*, the invasive Asian tiger mosquito, and Chikungunya and Dengue virus, two of 27 arboviruses these mosquitoes can transmit. Courtney came to UGA from the Pennsylvania State University, where she was a postdoctoral researcher in the Center for Infectious Disease Dynamics and Department of Entomology. She received her doctorate from the University of Michigan. Learn more about Courtney at t.uga.edu/1y9.

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John Wares

Associate Professor John Wares, a member of the UGA Genetics faculty who has partnered with colleagues in Ecology for a number of years, began a joint appointment with the Odum School in 2014. He studies gene flow and molecular diversity in natural populations. His work, most often in marine systems, combines genetic analysis and ecology. Current projects include genetic sequencing of the microbial community across diseased and undiseased individuals from coral populations in the Florida Keys, part of the NSF-funded study of white pox disease in *Acropora palmata* with Odum School colleagues Jim Porter, Andrew Park and alumna Katie Patterson Sutherland, MS CESD '97. He is working with Jeb Byers on the creation of a database of population and species ranges for the western Atlantic Ocean. He and Jeb are also collaborating on a study of the barnacle *Notochthamalus scabrosus* along its entire distribution from Peru to southern Chile, using genotype data generated from next-generation sequencing approaches, to identify the factors linking within-species diversity and broad patterns of biogeography. John received his doctorate from Duke University and was a postdoctoral researcher at the University of New Mexico and U.C. Davis prior to starting at Georgia in 2005. Learn more about John at t.uga.edu/1y8.

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Congratulations Graduates!

GRADUATE STUDENTS

SUMMER 2014

Catherine Bartenstein, MS CESD
Sarah Budischak, PhD Ecology
Virginia Schutte, PhD Ecology
Sam Woolford, MS CESD

FALL 2014

Thomas Barnum, PhD Ecology

SPRING 2015

Erin Abernethy, MS Ecology
Sabrie Breland, MS Ecology
Rebeca de Jesús Crespo, PhD
ICON
Carissa Ganong, PhD Ecology
Ross Pringle, MS CESD
Greg Skupien, MS CESD
Chelsea Smith, MS Ecology
Melanie Taylor, MS Ecology
Katherine Worsley-Tonks, MS
Ecology
Marcus Zokan, PhD Ecology

UNDERGRADUATES

SUMMER 2014

Laura Alexander, magna cum
laude with high honors
Amanda Calfee
Breanna Crowell, summa cum
laude with highest honors
Zachary Holmes, summa cum
laude with highest honors
Elizabeth Hughes
Elizabeth Shannan

FALL 2014

James Hunt
Amy Johnson
Rachel Jude
Ashley Na
Lindsay Opie, cum laude
Adam Palinski
Kaleigh Wood

Spring 2015

Henry Adams, summa cum laude
with honors
Cassidy Becker
Ryan Chitwood, magna cum laude
Taylor Echols, cum laude
Danielle Garcia, cum laude
Christopher Haffad
Timothy Montgomery, dual degree
in ecology and interdisciplinary
studies in marine sciences, cum
laude
Meryom Pattillo, dual degree in
ecology and chemistry
Samuel Benjamin Scuderi, with
a minor in environmental
economics and management,
magna cum laude
James Michael Stroup, dual degree
in ecology and genetics
Connor Timpone
Morgan Walker, dual degree in
ecology and biology, summa
cum laude with high honors
Katherine Zarada, dual degree in
ecology and biochemistry and
molecular biology, summa cum
laude with highest honors



Henry Adams, Cassidy Becker, Ryan Chitwood, and Kaleigh Davis (summer '15)



BARNARD

AWARDS, FELLOWSHIPS, AND SCHOLARSHIPS

■ Incoming doctoral student **Rebecca Atkins** received a Graduate Research Fellowship from the National Science Foundation.

■ Doctoral student **Dara Satterfield** received a National Science Foundation Dissertation Improvement Award. She also received the Stoddard-Burleigh-Sutton Award for Outstanding Contributions in Wildlife Conservation in 2015, a university-wide award for outstanding contributions in wildlife conservation and/or ornithology.

■ Undergraduate **Laura Alexander**, BS '14, was admitted to the Environment and Society: Data Science for the 21st Century (DS421) training program at the University of California, Berkeley, where she will pursue a doctorate beginning in fall 2015. DS421 is a new National Science Foundation Research Traineeship interdisciplinary graduate training program at UC Berkeley. Laura was also awarded a second-year DS421 Fellowship, which will cover full tuition and fees for year two of her studies as well as a 12-month stipend of \$32,000 for year two of the training program.

■ Professor **Craig Osenberg** was named a Fellow of the Ecological Society of America in 2015 in recognition of his outstanding contributions to the advancement of ecological knowledge. He is the fifth current or former UGA ecology faculty member so honored since the program began in 2012.

■ Associate Professor **Vanessa Ezenwa** spent fall semester as a Fulbright scholar conducting research at the Institute for Research and Development in Montpellier, France.



GUINNESSY

■ **Laura Early**, a master's of conservation ecology and sustainable development student, and doctoral student **Jenna Malek** were named 2016 John A. Knauss Marine Policy Fellowship finalists. The Knauss Fellowship is awarded by the National Oceanic and Atmospheric Administration Sea Grant program to graduate students interested in aquatic resources and policy. Early and Malek were nominated for the fellowship by the Georgia Sea Grant College Program. Finalists will be matched with hosts in the Legislative and Executive branches of the U.S. government in November 2015, and will begin their year-long fellowship in Washington, DC, in February 2016.

■ Undergraduates **Henry Adams**, BS '15, **Carmen Kraus**, **Morgan Walker**, BS '15, and **Katherine Zarada**, BS '15, were elected to membership in Phi Beta Kappa, the academic honor society, in 2015.

■ Doctoral student **Ania Majewska** received the Joan Mosenthal de Wind Award for Pollinator Conservation from the Xerces Society, a Garden Club of America Board of Associates Centennial Pollinator Fellowship, and a Monarch Joint Venture Research Award.

■ Undergraduate **Meryom Pattillo**, BS '15, received the Anderson and Crum Award from the American Bryological and Lichenological Society for her research on the Middle Oconee River examining macroinvertebrate utilization of bryophytes (mosses and liverworts) in a Piedmont river.

■ Doctoral student **Cecelia Sánchez** received an Exploration Fund grant from the Explorers Club and an Innovative and Interdisciplinary Research Grant from the UGA Graduate School for her study of emerging diseases in flying foxes.



SÁNCHEZ

■ Doctoral student **Daniel Becker** was named a 2014 ARCS Scholar and received the Gilham/ARCS Century Award from the Atlanta Chapter of the ARCS Foundation, which supports academically outstanding U.S. citizens working on degrees in science, engineering, and medical research.

■ **Elizabeth Guinessey**, a doctoral student in Integrative Conservation and Ecology, received the M.K. Pentecost Ecology Fund award for 2015 from the Savannah Presbytery. The annual award was established to promote environmental justice and ecological stewardship of natural resources in the Southeastern U.S.

■ Doctoral student **Jenna Malek** and incoming doctoral student **Rebecca Atkins** were recognized for outstanding graduate oral presentations at the annual Benthic Ecology Meeting in 2015 in Quebec.

■ Alumnus **Chip Small**, PhD '10, doctoral student **Pedro J. Torres**, Lauren M. Schweizer, John H. Duff, and Distinguished Research Professor **Catherine M. Pringle** received the 2014 Award of Excellence from the Association for Tropical Biology for their paper "Importance of Terrestrial Arthropods as Subsidies in Lowland Neotropical Rain Forest Stream Ecosystems," which appeared in the journal *Biotropica* in 2013.

OTHER RECOGNITION

■ Associate Dean **Sonia Altizer** was named the UGA Athletic Association Professor in Ecology in 2014.

■ Doctoral students **Carrie Keogh** and **Elise Krueger** and master's student **Melanie Taylor** received UGA Provost's Outstanding Teaching Assistant Awards in 2015.



SATTERFIELD

■ Undergraduate Coordinator **Carol Hoffman** and **James Porter**, Josiah Meigs Distinguished Professor, were named UGA Outstanding Teaching Faculty in 2015.

■ Associate Dean **Sonia Altizer**, Associate Professor **John Drake**, and **Julie Rushmore**, PhD '13, were among 15 presenters who took the stage in March as part of TEDxUGA 2015. Undergraduate **Malcolm Barnard** was a finalist in the TEDxUGA Student Ideas competition. To see video of their talks: t.uga.edu/1zo

■ The Odum School had a large presence at the 2015 UGA Center for Undergraduate Research Opportunities Symposium. Associate Dean and UGA Athletic Association Professor in Ecology **Sonia Altizer** gave the keynote address; Professor **Jeb Byers** received the CURO Research Mentoring Award; and **Timothy Montgomery**, BS '15, won the award for Best Paper in the Physical and Environmental Sciences. The Odum School's other participants were Ramsey Scholar **Malcolm Barnard**; **Ryan Chitwood**, BS '15, **Kaleigh Davis**, Foundation Fellow and ecology minor **Allison Koch**; **Jack Owen**; **Meryom Pattillo**, BS '15; **Sarah Perry**, **Stuart Sims**; CURO Research Assistant **David Stoker**; CURO Research Assistant **Rachel Usher**; and CURO Research Assistant **Katherine Zarada**, BS '15, with CURO Graduation Distinction. For more details: t.uga.edu/1tH

SELECTED GRANTS

■ Associate Professor **John M. Drake** is the lead PI on a five-year \$3.178 million grant from the **National Institutes of Health** National Institute of General Medical Sciences Models of Infectious Disease Agent Study for "Forecasting tipping points



SMALL AND TORRES

in emerging and re-emerging infectious diseases." Co-PIs are **Andrew Park**; **Pejman Rohani**, former Odum faculty member currently at the University of Michigan who will be returning to UGA in 2015; **Bogdan Epureanu** from the University of Michigan; and **Matthew Ferrari** of Pennsylvania State University (see Ecology of Infectious Diseases: Epidemic Modeling, Ebola, and Tipping Points, page 8.)

■ **John M. Drake** is a co-PI on a five-year grant from the **National Institutes of Health** to B. Halloran of the Fred Hutchinson Cancer Research Center at the University of Washington to create a Center for Statistics and Quantitative Infectious Diseases. Drake's component of the grant is \$180,705.

■ **Sonia Hernandez**, PhD '08, associate professor in the Warnell School of Forestry and Natural Resources with a joint appointment in the College of Veterinary Medicine, is lead PI on a five-year \$2.14 million grant from the **National Science Foundation** Ecology and Evolution of Infectious Disease Panel for "Consequences of Anthropogenic Resources for the Cross-Scale Dynamics of an Enteric Pathogen in an Avian Host." Co-PIs include Associate Dean and UGA Athletic Association Professor in Ecology **Sonia Altizer** and Associate Research Scientist **Richard Hall**.

■ Assistant Research Scientist **Andrew Kramer** is the lead PI on a two-year \$291,000 Macrosystems Biology grant from the **National Science Foundation** for "Multi-scale dynamics of white-nose syndrome in North America." Associate Professor **John M. Drake** is co-PI.

■ **NASA** has awarded a grant of \$904,000 to a team of researchers

led by **Seth Wenger**, MS CESD '99/PhD '06, assistant professor and director for science of the River Basin Center, to develop new methods of population viability assessment to improve conservation of imperiled species. These methods connect population ecology and genetic approaches that rely on extensive field collections with landscape ecology methods that rely on broad-scale Earth observations, including those of NASA satellites. Efforts are currently focused on trout species in the western U.S. but may expand to other types of organisms in other parts of the U.S.

In addition to UGA, partners on the project include the University of Montana, Trout Unlimited, the U.S. Forest Service, the U.S. Geological Survey, the U.S. Fish and Wildlife Service, the University of Nevada-Reno, consulting firm Lupine Logic, the Bureau of Land Management, Seattle City Light, and fish and wildlife agencies from the states of Nevada, California, Utah, Montana, and Idaho.

■ **Seth Wenger**, MS CESD '99/PhD '06, assistant professor and director for science of the River Basin Center, has received a grant for \$138,691 from the **National Fish and Wildlife Foundation** for "Southeastern Aquatic Biodiversity Conservation Opportunity Analysis." Co-PIs include **Laurie Fowler**, associate dean and director for policy of the River Basin Center, River Basin Center Senior Legal Fellow **Katie Sheehan Hill**, and River Basin Center postdoctoral researcher **Duncan Elkins**. The purpose of the one-year project, to be undertaken in collaboration with researchers from the Tennessee Aquarium, is to develop a prioritization scheme and action plan for conserving southeastern freshwater biodiversity.

Milestones

Weddings



Doctoral student Kaitlin Farrell married Danny Jackson on Nov. 8, 2014, at the State Botanical Garden in Athens.



Doctoral student Alexa Fritzsche married Kyle McKay, PhD '14, on October 25, 2014, in Denver.

Odum Babies!



Jocelynn Emma Mathews Colbert was born to master's student Joseph Edward Colbert III and Julinnah Matthews on July 5, 2014.



James Donald Dudley was born to doctoral student Maura and Chris Dudley on January 25, 2015.



EcoBox

When we learned that our beloved accountant Emily Schattler and her husband Dar were adopting three children from an orphanage in Peru, the Odum School community came up with a creative—and hilarious—way to help.

EcoBox, modeled on Athens' popular Rabbit Box storytelling series, featured 10 brave souls sharing some of their most memorable experiences with nature. The audience, which packed the auditorium, was treated to stories that ranged from Ron Carroll's West African folktale about Ananse the trickster spider to the inspirational poem "Why Zed?" read by John Pickering, and in between covered insects (Alexa Fritzsche McKay), rats (Curtiss Pernice), a night spent in a tree in the rainforest (Jill Anderson), a job as a whooping crane "mom" (Kait Farrell), a live-action demonstration about dolphin communication (Jim Porter, with help from the audience), and the unique fashion choices of ecologists (Katherine Adams).

The evening also featured supper and a live and silent auction, and raised over \$5,000 to help Emily and Dar prepare their home to accommodate their new family.

From the Director of Development

Hello Odum School Alumni and Friends,

We're embarking on an exciting two years here in the Odum School of Ecology. On the horizon are several anniversaries worth celebrating. First up is the Ecological Society of America's centennial. The Odum School will have a strong presence, as always, and will also host a social mixer for our alumni, faculty, and students attending the conference.

In October 2015 the Conservation Ecology and Sustainable Development graduate program will be celebrating its twentieth anniversary. We look forward to welcoming back alumni and friends to celebrate the last twenty years and also look ahead to the next twenty.

Looking further down the road we have two big birthdays to celebrate. 2017 will mark the fiftieth anniversary of the Institute of Ecology and the tenth anniversary of the Odum School. We've already begun planning for these converging anniversaries and we invite your input. This will be a celebration of the many people who have contributed to the continued success of ecology at the University of Georgia. A date will be selected soon and save the date cards will follow.

We're immensely proud of all of our alumni and invite you to stay engaged with your alma mater. Please feel free to send along exciting news in both your professional and personal lives. Along with this annual issue of *EcoVoice* we also send out a monthly installment via email. We'd love to include more alumni stories.

Good luck in all your pursuits. Remember to stay in touch!



Lee Snelling
snelling@uga.edu

The Eugene P. Odum School of Ecology would like to thank all of our alumni and friends for their support. Below are all who made gifts between July 1, 2014, and May 31, 2015.*

Callie M. Abernathy
Henry C. Adams, BS '15
The Alex and Janet Patterson Fund
Christine Altizer
The Animal Behavior Society
Anonymous
Athens Area Community Foundation
Wilson G. Barmeyer and Sarah Gaines Barmeyer, MS
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Roselyn Haram
Terri Haram
Thelma Haram
Carlos W. Harden, BS '71
Eugene S. Helfman and Judith L. Meyer
Carl L. Higginbotham, BS '70, and
Pamela H. Higginbotham

Leonard W. Hindsman Jr., BS '66
Robert E. Holmes and Penelope S. Crump
Roger K. Hux and Julia E. Krebs, MS '72/PhD '77
Jane Smith Turner Foundation
Felton Jenkins III, BS '90, and Karen Jenkins
Julie R. Jenkins
Catherine M. Joyce, PhD '85
Philip Juras and Beth Gavrilles
Margaret G. Kearns, MS CESD '01
Carolyn L. Keogh
James E. and Linda M. Kundell
Ngeow Kwee
Jianguo Liu, PhD '92, and Qiuyun Wang
Jack I. Lowe, MS '55, and Margaret A. Lowe
Ann C. MacKenna
Bruce Martin
James A. Marsh Jr., PhD '68
Brenda and John Mattox
Calley A. Mersmann, BS '11
Emilie C. Morris
Katherine and Tim Morris
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Yin Ngeow
The Oconee Golf Company, LLC
Ruth Owens
Pat Tillman Foundation
Christopher B. Patten
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The M.K. Pentecost Ecology Fund Committee
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James G. Wiener, PhD '79
Jenny Willenborg
Douglas C. and Christine Wolf
Wormsloe Foundation Inc.
The Xerces Society for Invertebrate Conservation

* Since this installment of *EcoVoice* went to print before the close of the fiscal year, we regret that we were not able to include donors who gave after June 1, 2015.



ALTIZER



BYERS



DRAKE



EZENWA



GITTLEMAN



HALL



HAN

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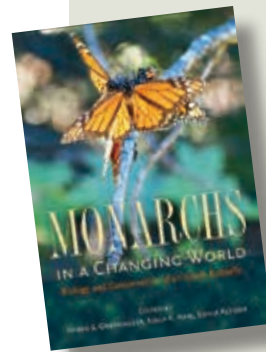
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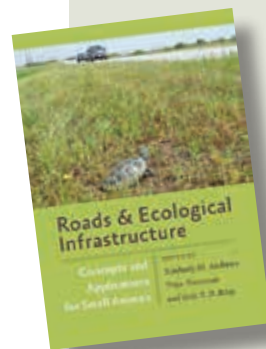
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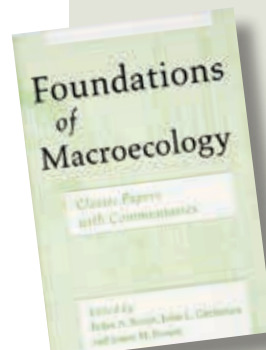
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UPCOMING EVENTS

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Conservation Ecology and Sustainable Development Graduate Program

Calling All CESD Alumni!

This fall the CESD graduate program will celebrate its twentieth anniversary with a reunion and symposium in Athens from Oct. 22-24. All CESD master's and certificate program alumni are invited! The symposium will feature alumni and other invited speakers, and there'll be plenty of social events to give attendees the chance to reconnect with old friends and network with each other, current students, and faculty.

For details and to register, see t.uga.edu/1xG

Ecology to Celebrate Milestone Anniversaries in 2017

2017 is a significant year for the UGA ecology community, marking 50 years since the formal establishment of the Institute of Ecology and 10 since the Institute became the Odum School. Planning is underway for a series of events to celebrate the past, present, and future of ecology at UGA. Stay tuned for more information!