

Promoting Sustainability

Wide-Ranging Programs Drive 'Green' Research and Education

10 THINGS YOU CAN DO TO PROMOTE SUSTAINABILITY

Promote sustainability activities on social media.

Support natural conservation projects here and around the world. Avoid eating beef on a daily basis.

Get involved with "green" organizations in South Florida.

Use native plants in your yard.

Choose sustainably grown foods in the supermarket.

Go green in your workplace; reduce energy and water consumption.

Join the Green U initiative.

Purchase local fruits and vegetables at farmers' markets.

Use compost for your lawn or garden.

Use refillable water containers rather than throwaway plastic bottles.



Plant performance Michelle Afkhami investigates how microbiomes impact salinity tolerance within mangrove leaves.

F

rom research in the tropical rainforest to hands-on gardening experiences, the College of Arts and

Sciences is promoting environmental sustainability in many ways. Students can study fragile ecosystems, learn about sustainable farming practices, and enroll in a new urban resiliency master's program.

"Sustainability is perhaps the most important issue facing our world today," said Leonidas Bachas, dean of the College of Arts and Sciences. "We are taking a collaborative approach to addressing this challenge in our classrooms, research laboratories, and outdoor settings on campus and throughout the hemisphere. The goal is to educate and inform our students about the need to preserve our limited natural resources for future generations."

There are many ways that University of Miami students, faculty, staff, and alumni can promote sustainability, including recycling waste products, conserving drinking water and managing fuel and electricity to reduce greenhouse gas emissions.



Green Thumb Students maintain the garden on the Coral Gables campus.

“But along with those activities there is a need to talk about the sustainability of ecosystems that are essential for the health of our planet,” said Athula H. Wikramanayake, professor and chair of biology. “That’s why we are studying the impact of a warming climate on soils, plants, forests, and animals, as well as the microbes that interact with them all.”

Sustainable Ecosystems

From a biological perspective, important research and education projects on sustainability are underway on the Coral Gables campus, in threatened habitats in Florida, and in the tropical rainforests and mountains of South and Central America.

Kenneth Feeley and Mauro Galetti, associate professors of biology, are “conservation ecologists” whose

research focuses on understanding the effects of humans on the natural environment. For instance, Galetti has studied the impact of forest loss and poaching on tropical ecosystems.

“When you remove monkeys, toucans, tapirs and other large, wild animals from the rainforests, you impact the forest regeneration, because these large animals disperse large seeds that produce large hardwood trees that store more carbon from the atmosphere,” said Galetti, who is also the director of the John C. Gifford Arboretum on the Coral Gables campus. “We tend to think that the problem that is happening far away does not affect us, but everything is connected. The biodiversity in the Amazon rainforest helps to stabilize world climate,” emphasized Galetti.

Feeley is looking at how climate change is impacting South America’s plant life.

He has seen significant changes in

recent years in Peru’s Manú National Park, one of the most biodiverse places on Earth. “In the Andes, the climate ranges from cold and windy in the highlands, to hot and humid in the lowlands,” he said. “We look at the gradient between those two habitats and see what temperatures are preferred by different species. With global warming, we are finding that the seeds of trees and other plants do better higher and higher on the mountain. For many species, there has been a clear directional movement from generation to generation.”

But Feeley says that the space available for plant species is limited at higher elevations. “Unlike the U.S., the Andes supports a large population and their activities, including cattle-ranching and farming, on the tops of mountains. That compresses the potential area for trees to grow as they move up the mountain and try to



Kenneth Feeley

survive in a warming climate.”

Feeley added that much of the deforestation of the Amazon is driven by global demand for raising cattle to provide beef. “As consumers, we have power to make responsible decisions about sustainability,” he said. “You don’t have to chain yourself to a tree. Instead, you can change your purchases at the grocery store.”

Students with an interest in biodiversity can sign up for the College’s UGalapagos Program, which includes classes in the Andes, tropical field stations in the lowland Amazon rainforest, and the unique ecosystems of the isolated Galapagos Islands. Both Feeley and Galetti are instructors at the UGalapagos Program. “Many of these students have not previously traveled outside the U.S. and having them spend time with host families in these locations is an amazing educational and cultural experience,” said Wikramanayake. “Everyone who participated has gained a deep appreciation for the diversity of these pristine environments in all their glory. It can be a profound influence on their careers, as well as their lives.”



Richard Weisskoff

Hands-On Campus Programs: Biodiversity is Around Us

UM students don't have to travel thousands of miles to learn about sustainable farming and conservations practices. At the northwest tip of the Coral Gables campus is the John C. Gifford Arboretum, a valuable natural resource that supports several Arts and Sciences initiatives.

“The Arboretum is a great place for students to learn about nature and sustainability,” said Galetti. “It is a place where students have hands-on classes on ecology, botany, ethnobotany, and sustainability. Like a petri dish in a microbiology lab, the Arboretum is ideal to teach students about how Mother Nature works.”

Feeley adds that the Arboretum provides students with opportunities to learn about tropical plant species not found in North America. “There are great examples of many rare and endemic species in the Arboretum, including relatives of the mahogany tree, hundreds of palm trees, and

representatives of the tropic’s amazing diversity,” he said.

Through a partnership with the biology department, a new greenhouse is now under construction in the Arboretum. “This is an important step in advancing the sustainability of our university,” said Michelle E. Afkhami, assistant professor of biology.

The 3,000-square foot greenhouse, expected to be completed this summer, will add a new dimension to the College’s plant biology courses, said Afkhami, whose research focuses on microbiome effects on individual plants and plant population—an issue that’s critical to imperiled species conservation.

Afkhami has studied microbiomes at the Archbold Biological Station in Central Florida, and collaborated with South Florida Water Management District researchers on studies on tree islands in the Everglades. “We need to understand how habitat loss



L-R: Mauro Galetti, Sonia Chao, Shouraseni Sen Roy

affects our urban plant and microbial populations in South Florida, so we can better conserve and manage native species,” she said. “We also do research on improving crop production and reducing the impact on the natural environment and human health.”

With the new greenhouse, Afkhami says students will be able to gain a better understanding of the microbiomes of subtropical species, as well as agricultural sustainability using plant-microbe interactions to pull nitrogen from the atmosphere into the soil.

A Sustainability Garden

In an open area just south of the Arboretum, a sustainability garden allows students to develop a hands-on understanding of subtropical agriculture, recycling practice, and growing their own food.

Terri Hood, assistant director of the Ecosystem Science and Policy Program, calls the garden “a beautiful example” of the College’s commitment to conveying the practical aspect of sustainability. “It’s easy to lecture about resilience and recycling, but students also need an opportunity to see how it works in practice,” she said.

For example, Hood’s students collect organic mulch and mix minerals into the soil. “We also bury waste newspapers from the Otto G. Richter Library and fallen branches from trees in the Arboretum into the soil, where they act like a sponge, collecting rainwater and releasing it slowly,” said Hood.

Along with soil improvements, students can learn about sustainable practices for suburban yards and urban green spaces, like apartment terraces and rooftop gardens. There are “trial beds” in the garden for class projects that can be rotated each semester. This spring, the focus is on using a

small space to grow a diverse set of crops, such as peppers, tomatoes, herbs, and coneflowers, which produce echinacea, a supplement normally purchased in a store. “We are also focusing on plants that are culturally significant and at risk for extinction, such as Seminole pumpkins, called the ‘squash of the Everglades,’” she added.

UM students can take advantage of other kinds of hands-on learning opportunities as well. Richard Weisskoff, professor and chair of International Studies, holds outdoor classes on the “student farm,” which showcases subtropical and tropical crops grown in the Caribbean and Central America to develop an understanding of global food policies and products.

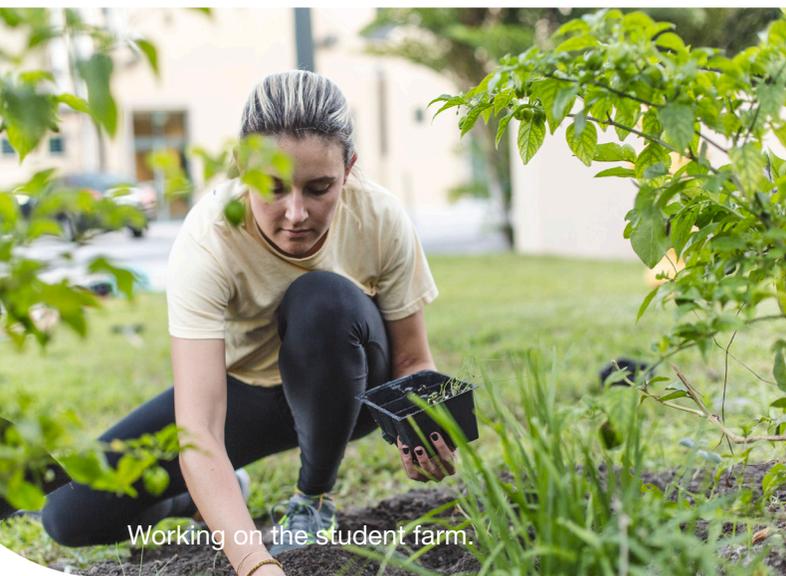
“The way you learn agriculture is to work with someone who knows it,” said Weisskoff, who spent summers in Puerto Rico, Peru, and Paraguay as a farmhand to guide his economic research. “Along with book learning, students can watch a sprout grow, harvest it and then learn how to cook it.”

As Wikramanayake said, “It’s a little piece of this campus, but it can have a big impact in terms of developing awareness among our students.”

Urban Sustainability

A new Master of Professional Science in Urban Sustainability and Resilience will enroll its first students this fall. Shouraseni Sen Roy, professor of geography and regional studies, will co-direct the interdisciplinary graduate program with Sonia Chao, research associate professor, School of Architecture.

“The purpose of this new interdisciplinary master’s degree program is to help our students understand the way global cities operate and how sustainability is necessary to build



Working on the student farm.

and maintain resilient metropolises around the world,” said Bachas.

Roy said the new program examines how large cities are coping with challenges through courses in urban management and urban design. Students also will take a look at how population growth and other factors can affect city planning, urbanization, and even health. “We know that there is climate change happening,” said Roy. “What is Miami doing to deal with this? How are other cities addressing the problem?”

Students can select electives from other schools and divisions, including the Rosenstiel School of Marine and Atmospheric Science, College of Engineering, Miller School of Medicine’s Department of Public Health Sciences, and Miami Herbert Business School. The program is open to students from all disciplines who wish to work in government, NGOs or private industry and devote their time to climate mitigation or adaptation issues, such as in the role of chief resiliency officers.

“What better place to study the impact of climate change than Miami,” said Chao. “Students do not have to read about red tide or urban flooding. They just have to go to the beach or one of our low-lying barrier island communities and experience it. But, South Florida is also a testing ground of climate action.”

Turning Plastic into Art

Next time you’re tempted to purchase a plastic bottle of water, consider the long-term consequences to the environment. Far too many of the 50 billion plastic water bottles Americans use annually wind up in the ocean, killing an estimated 1 million marine animals that ingest the synthetic particles every year.

Jenna Efrein, the senior lecturer in glass in the Art and Art History Department, has created interactive installations featuring plastic bottles to bring awareness to this global sustainability issue. By stringing the bottles on fishing line and hanging them in an undulating “waterway” that people can navigate, Efrein hopes to impart a sense of how sea creatures, from the largest killer whales to tiny phytoplankton, feel while swimming in oceans of pollution. “Plastics are not biodegradable,” she said. “They are unnecessary trash, as there are plenty of reusable options for drinking water.”

Her installations have been featured at several locations, including the Marjory Stoneman Douglas Biscayne Nature Center on Key Biscayne in January. Measuring 54 feet, this “Waterway” was suspended under a walkway for a month, reminding beach-goers not to take plastic bottles to the beach, or carry empty bottles back to recycling containers.

As Efrein says, “We are all responsible for changing our practices. When it comes to plastic bottles, we are all culpable.” ■



No Limitations

Landon Coles has a long list of notable accolades at the University of Miami, but he is not one to brag about them. In fact, the sophomore class senator for Student Government is quite humbled by his accomplishments, particularly his achievement as a Ronald A. Hammond Scholar.

“**E**very day I am so grateful,” said Coles, who is majoring in political science and works as an assistant in the Office of Multicultural Student Affairs. “Because of this scholarship, I have been granted self-agency to chart my own path here at the University and beyond.” And chart it he has, thanks to the scholarship named for the University’s first director of minority affairs, which provides full tuition to diverse, academically excellent high school seniors from underrepresented backgrounds.

Coles decided early on to “impact my University community.” He did so, first, by running for the Student Government Senate, during his first semester, becoming one of two senators for his freshmen class, and in the spring earning a Senator of the Year award. He also served as co-chair of the King & Queen Pageant for the 2019 Homecoming Executive Committee.

Now a senator for his sophomore class, he is also a member of the Undergraduate Honor Council and the United Black Students Executive Board, and student ambassador and tour guide for the President’s 100.

But it is at the Office of Multicultural Affairs where he particularly feels at home.

“Everyone at the Office of Multicultural Student Affairs pushes me to be the best version of me and holds me accountable to give my best effort,” Coles said. “They are

like a family to me. I love working here because we celebrate UM’s diversity and understand how it’s a tool, not an impediment, for success.”

The second son of six children, Coles grew up in Tallahassee, where his single mother, Leasha Weaver, showed him how to be a strong role model.

“Growing up, I watched my mom labor every day. She taught me how to be passionate, kind, strong, and courageous,” said Coles, who particularly loves being big brother to his four younger sisters. “Being a big brother has taught me about life. Being a big brother has taught me about responsibility, leadership, and selflessly caring for others.”

Landon also has an impressive list of mentors at UM, including Ryan C. Holmes, associate vice president for student affairs and dean of students; Renee Dickens Callan, executive director of student life; Patricia Whitely, vice president of student affairs; and, of course, the entire Office of Multicultural Affairs.

Which may explain how, as humble as Coles is, he has high aspirations for the future. After graduation, he plans to attend law school and make his way into the public sector, where he vows to “keep helping those who are underrepresented and historically marginalized.”

“I have a passion for social justice, equity, diversity, and inclusion,” Coles said. “I see myself working in the federal government. I see myself as a congressman, a senator, and maybe one day in the White House.” ■