

WAKE UP CALL FROM THE JUNGLE

STORY AND PHOTOS
BY BRIAN KOONZ

Students learn about sustainability in the lush rainforest of Costa Rica

The sun is still wrapped in a sapphire blanket when the concert begins at Earth University in Costa Rica. The air is cool and the grass is beaded from the showers that visited overnight.

It doesn't take long before one voice in the jungle becomes a wake-up call of whoops, whistles and warbles. From howler monkeys in the treetops to birds seemingly painted by rainbows, it's the soundtrack of the jungle.

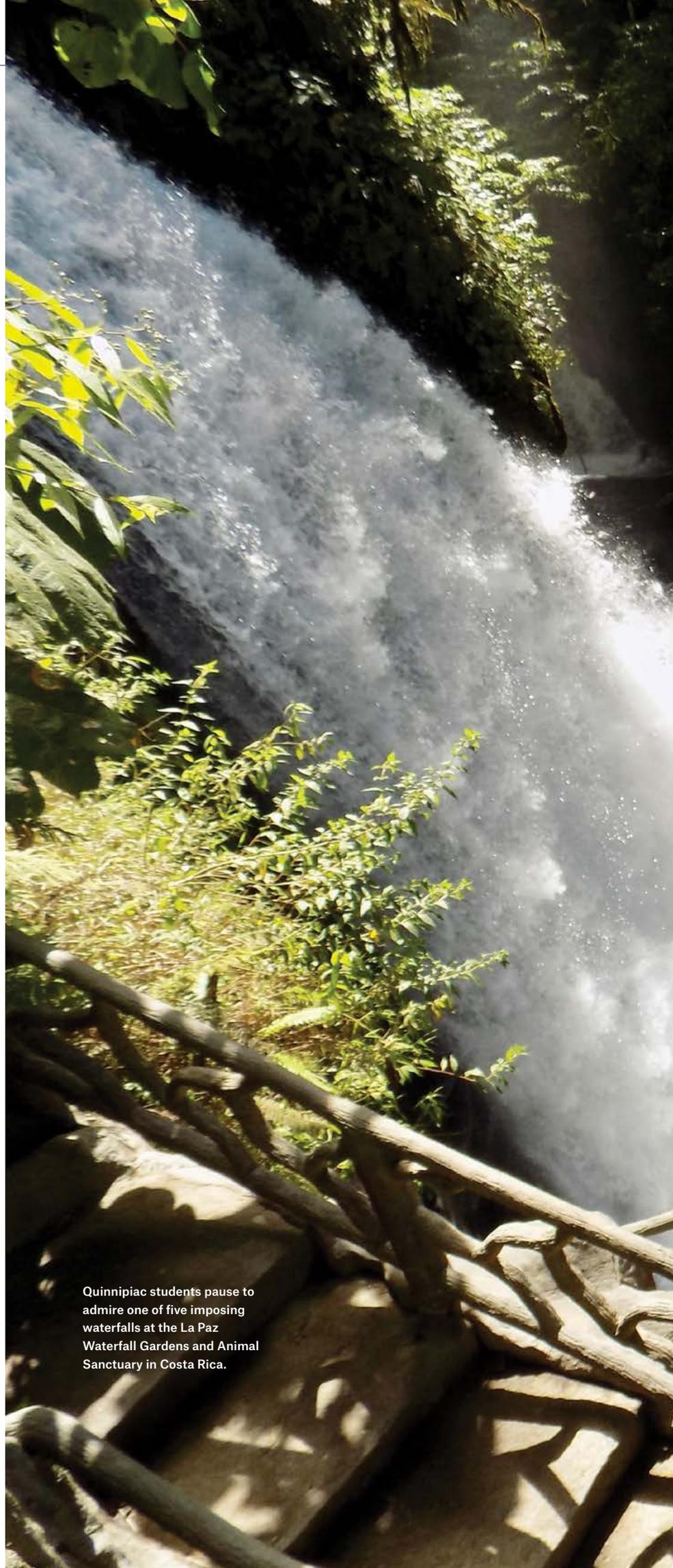
The more important wake-up call—a mandate for sustainability and responsible stewardship to preserve the planet—is even louder. A new course at Quinnipiac examines the local and global urgency of sustainability in an experiential, multicultural context.

In January, Allan Smits, former associate dean and long-time faculty member in the College of Arts and Sciences, and Courtney McGinnis, associate professor of biological sciences, traveled to Costa Rica with 10 students to learn about sustainability in the living classroom of the rainforest.

"It's important for people to get out of their comfort zones and see a world they haven't seen before and a culture they haven't seen before," Smits said. "When you don't see cultures sharing the world outside of your own environment, you really don't appreciate the interconnectedness of cultures and of everyone working together for the planet Earth."

The course—Lessons in Local and Global Sustainability—began with a 10-day intersession trip to Costa Rica and continued through the spring at Quinnipiac's Mount Carmel Campus. The trip included a visit to the La Paz Waterfall Gardens and Animal Sanctuary, where students soaked up the spray from five waterfalls and learned about 100 different species of animals, including two-toed sloths named Rocket, Flash and Guapa. From there, the group spent six days at Earth University and three days at the coastal town of Tamarindo.

But it was the time spent at Earth University, a four-year institution that confers a single degree in agricultural sciences, that gave QU students a master class in discovery.



Quinnipiac students pause to admire one of five imposing waterfalls at the La Paz Waterfall Gardens and Animal Sanctuary in Costa Rica.



QU students learned how they could reduce their own carbon footprints — the amount of carbon dioxide and other greenhouse gases released by burning fossil fuels as part of an activity.

“I like how we all learned from each other, not just as a group of students from Quinnipiac, but from the students and teachers at Earth, too,” said Brendan Murphy '20, a health science studies major. “We all share the same planet. We all need to work together to take care of it.”

During the group's studies at Earth, a carbon footprint became more than an obscure scientific phrase. It became an imperative. QU students learned how they could reduce their own carbon footprints—the amount of carbon dioxide and other greenhouse gases released by burning fossil fuels as part of an activity. For example, everyone can reduce carbon emissions by driving less, keeping thermostats in check at home and buying locally sourced food, not food that's been shipped from around the world.

These lessons of conservation and moderation are not restricted to Costa Rica, of course. The Department of Cultural and Global Engagement at QU directs faculty-led study abroad courses all over the world. This winter's trips took students to Costa Rica, Australia/New Zealand and Barbados. Other groups went to Guatemala and South Africa.

Pantaleon Chavarría, a quality control supervisor at Earth University's banana packing plant, inspects the latest harvest with students.



“What is integral to any Quinnipiac global engagement program is learning from others,” said Erin Sabato, director of international service and learning at QU. “We hope that through these experiences, our students develop cultural humility, lifelong curiosity and the ability to be deep and critical

thinkers. We have brilliant teaching and learning partners all over the world that are imperative to these programs.”

BANANAS: MORE THAN A CASH CROP

Unlike Quinnipiac, Earth's 400 or so students come primarily from Latin America, Africa and the Caribbean—most of them on full scholarship, all of them with stories of persistence. It's not uncommon for students to apply two, three, even four times to Earth before they are accepted.

Nancy Musa, a 24-year-old student from Zimbabwe, served as Quinnipiac's teaching assistant and liaison at Earth. Like her peers there, Musa has learned to drive a tractor, calculate carbon emissions and develop entrepreneurial business models. These outcomes are designed to give graduates the skills to return home and help their mostly agrarian communities by creating jobs, increasing yields and promoting sustainable practices.

“Just let the moment be and you'll discover amazing things here,” Musa told the Quinnipiac students. “I have learned so much and made so many new friends. We all learn together. It's a life-changing opportunity.”

Earth University's primary source of revenue is an 800-acre banana plantation on campus. The operation employs about 600 people from local communities and generates about \$1 million to \$2 million annually, according to Earth business professor Irene Alvarado Van der Laet, who teaches economics, supply chain management and entrepreneurship.

The banana plantation became the perfect case study as QU students learned that sustainability is interdisciplinary. It touches on factors that are cultural, sociological, historical, economical and biological. It also deals with climate change. After a lecture about the business of agriculture, students toured the huge banana packing plant, an open-air warehouse where workers inspect, wash, spray and pack the bananas at assembly line stations, 10 hours a day, five days a week.

“The packing plant is really hard work,” said Maya Narvekar '22, a student in the dual-degree BS in health science studies/MHS in occupational therapy program. “The ladies at the station who were taking the bananas out of the water, turning around and putting them in the next area did it so fast. It was all like a blur. They're on their feet the whole time.”

In a country with the second-highest unemployment rate in Latin America—12.4 percent—reliable jobs like the ones at Earth's banana plantation are critical to socioeconomic stability. From the farmers to the packing plant workers to the truck drivers, there is pride in hard work and accrued value in their knowledge.

Consider Pantaleon Chavarría, a quality control supervisor at the packing plant. His face is kind and weathered by the sun. A few weeks after the Quinnipiac students completed their visit and returned to campus, Chavarría marked his 20th anniversary at the plant.

“When I asked people if their job was tiresome, or if they didn't like the intensive labor, they said, ‘I don't care. I don't think about that. I'm sending three kids off to school,’” said Kyra Angileri '21, a sociology major who hopes to study law after her undergraduate work. “Since this is a more rural part of the country, there aren't a lot of other options for employment.”

The Quinnipiac students also used packing plant data to determine the carbon footprint created by eating one



Scan the code to watch a Day in the Life video with Kyra Angileri '21

banana. For example, how much does one banana weigh? How much fuel is used to bring that banana 70 kilometers to the port? How about a truck full of bananas? How do these numbers match up with the emission tables distributed in class?

While Earth aspires to be carbon neutral—99 percent of Costa Rica’s energy is renewable—it’s an incremental goal that requires a collective response. And a collective patience.

“Be hard with the ideas, soft with the people,” Alvarado said, a concept that clearly resonated with the students, who repeated it many times during the trip. “When hearts are together, you don’t need to yell.”



CLEAN WATER? CHECK THE LARVAE

On the clearest days—and there are many here—the mountains that frame Earth University’s campus are majestic. A crown of clouds floats just beneath their purple peaks. The mountains, Smits explains, were formed by Costa Rica’s ancient volcanoes thousands of years ago.

These clouds carry water across a tropical country that is home to an incredible 5 percent of the world’s species. To put that figure into context, Costa Rica is roughly the size of West Virginia.

It’s estimated that 1.1 billion people around the world don’t have access to clean drinking water, said Alex Gilman, a professor of applied ecology at Earth. The implications can be dire—crops fail, disease flourishes and people die. So when Gilman pitched a trip to test the water quality of a stream on campus, the students pulled on their black rubber boots, grabbed a net connected to two broomsticks (imagine a foldable military stretcher) and set off to find macroinvertebrates.

In this case, the macroinvertebrates were larvae, the kind that live under rocks in a stream and don’t take kindly to students kicking over their homes so the current sends them swirling into those open nets with the broomsticks.

“I wasn’t sure what we were going to find,” said Anna Ciacciarella ’21, an English major and a student representative on Quinnipiac’s Sustainability Committee. “You really can’t tell what you have when you’re standing in the water collecting them. Once we emptied our nets and saw what was inside, we were excited to learn what kind of macroinvertebrates we had and what it meant.”

Why macroinvertebrates? If you find lots of larvae that can only thrive in clean water, that’s a good thing. If your net is filled with larvae that thrive in water with *E. coli* and other bacteria, well, that’s the opposite of a good thing. Usually, you find some of both kinds.

After the students sorted their larvae and identified them with the help of photo charts, they concluded the stream was

probably safe for swimming, but definitely not for drinking.

“We don’t expect to get excellent water quality here,” Gilman said, explaining that the group’s collection efforts only represented a snapshot in time. “We already know the water has been affected by human impacts such as untreated secondary sewage, the roadbuilding that’s going on just above where we are, and the high levels of nutrients from the application of fertilizers.”

Other times, the bacteria at Earth is saved, even valued. At the dairy farm on campus, Gilman and others have built two biodigesters—rudimentary but highly effective systems of PVC pipes and canvas-like collection bags where “pig muck, chicken muck and cow muck” are converted from raw feces into methane gas for stoves and other applications.

BULLET ANTS AND BIODIVERSITY

Gilman also took students into the rainforest on campus to visit a pre-Columbian archaeological site. After spraying themselves with waves of bug repellent—everyone wore long-sleeved shirts, long pants and those same black rubber boots—the students followed Gilman into a magnificent clearing where tall trees reached for the sky and thick roots stretched across the jungle floor like tentacles.

Gilman pointed out ancient stones covered with mossy beards that once marked a road. And she warned about the intensely painful venom of bullet ants—so named because if one stings you, it feels like you’ve been shot.

“There are also venomous snakes here,” Gilman said almost nonchalantly, but with a tone that clearly startled the uninitiated and reminded them why they were wearing boots. “The venom is not life-threatening, but it can do kidney damage.”

From bullet ants and venomous snakes to the howler monkeys grunting from high up in the trees, Gilman said there are about 500,000 different species in Costa Rica. However, only 18 percent of these species have been identified because more than half of the country—52 percent—is dense forest cover.

People, wildlife, plants, insects, they all interact—sometimes in good ways, sometimes in bad.

Left: Maya Narvekar ’22, left, and Madison Pavone ’23 collect samples of macroinvertebrates to test local water quality.

Below: Leafcutter ants carve out sections of corn leaves to bring back to their nest.





Top: Professor Walter Ndonkeu Tita, an entomologist from Cameroon, whacks the top off a coconut with his machete so students can drink the liquid inside.

Below: Kyra Angileri '21, left, and Gabrielle Pena '22 sort through the samples they collected to test a stream's water quality.

"Life is about adaptability," Gilman said. "It's not what you know; it's what you can figure out."

McGinnis explained that adaptability and sustainability are like moving targets. They constantly require new strategies and new awareness to reduce waste and make better decisions to improve the health of both consumers and the planet. Many of these choices are simple and can be done at home.

"When you buy your food from a small farm or co-op, you eliminate the need to have your food carted in or shipped in. The food is fresher, and it's better for you," McGinnis said.

"There are companies out there that sell ugly fruit. Maybe it's not pretty, but it's still nutritious. It doesn't have to get thrown out and wasted."

From Imperfect Foods in San Francisco to bananas with freckles in the markdown section of your favorite supermarket, retailers and consumers have discovered an appetite for sustainable produce.

INSECTS: THE GOOD, BAD AND TASTY

While Costa Rica has "one of the highest intensities of pesticide use in the world," according to a recent study published by the National Institutes of Health, Earth University works hard to limit the impact of pesticides on its banana crop. In fact, Earth's sustainably grown bananas are sold in 85 percent of Whole Foods' 500 stores, according to the university.

While the Quinnipiac group was in Costa Rica, France passed a law to ban the five pesticides responsible for causing unprecedented honeybee deaths there. Without pollination, of course, there are no crops. And without crops, well, there is no food.

"There's a real cultural awareness of environmental issues and being environmentally conscious here," Ciacciarella said one night during the group's reflection. "It's amazing to me the level of respect that people have for the land and the food that's produced here."

Toxic sprays aren't the only solution to eliminating pests, said Earth professor Walter Ndonkeu Tita, an entomologist from Cameroon who also studied in Canada.



“We have to make smart decisions about what we do and how it impacts the world. Controlling pests is just one example of this. We cannot keep doing what we do without thinking about the consequences.”

— Professor Walter Ndonkeu Tita

Entomology, Tita said, is the study of insects and their relatives, a biological family tree that includes ticks, spiders, centipedes, crabs and scorpions. “I make my students eat insects,” Tita told the Quinnipiac students.

“Live ones?” Murphy wondered aloud, asking the same question everyone else was thinking.

“OK, you’ll see. Don’t worry,” Tita said with a grin.

Instead of reaching for a plate of fried grasshoppers or chocolate-covered crickets, Tita played a video of his students biting into these protein-packed critters. Roughly 30 percent of the world eats insects, Tita said, a number that drops dramatically in Western cultures.

But what about the leafcutter ants in Costa Rica that clip sections of leaves to take back to their nests? Or the worms and winged pests that destroy corn and other crops?

During an afternoon trip to the corn and citrus fields on campus, Tita taught QU students how to make traps using a synthetic sex pheromone hung from a wire. The pests are lured to the scent and fly into the traps looking to mate, only to fall hopelessly into a soap-and-water mixture in a repurposed jug or other container. These traps have a clear advantage over pesticides because they selectively remove only the pest insects.

“We have to make smart decisions about what we do and how it impacts the world. Controlling pests is just one example of this,” Tita said. “We cannot keep doing what we do without thinking about the consequences of our actions.”

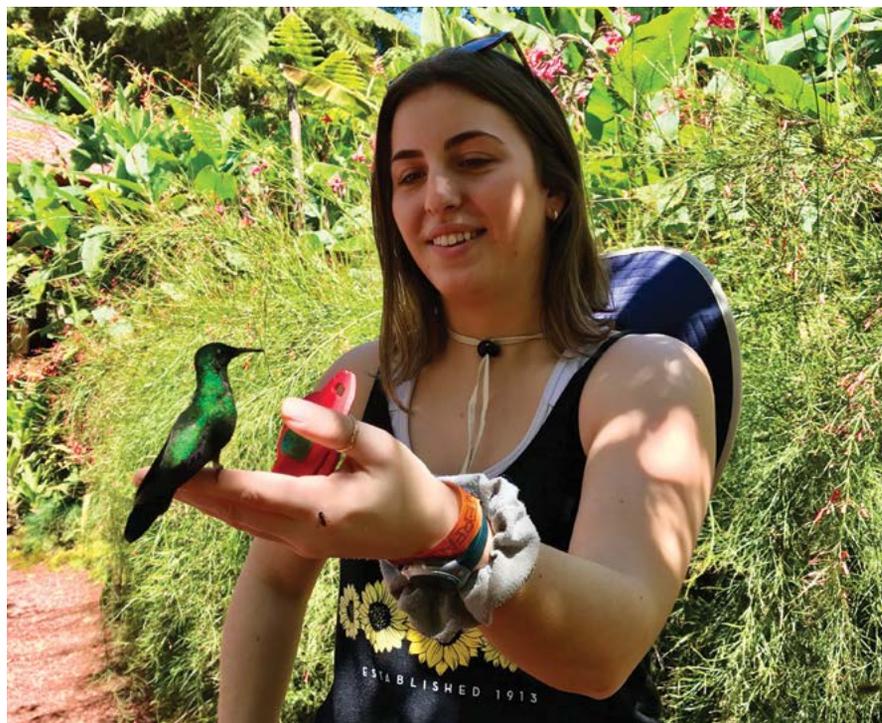
BACK ON CAMPUS

After the trip to Costa Rica, QU students spent the spring semester thinking about sustainability, stewardship and climate change—not just for themselves, but for everyone on the planet. Access to clean air and water, a nutritious and widely available food supply, renewable energy to reduce carbon emissions—it all matters.

Similar discussions took place across Quinnipiac this winter at town hall events on the Hamden and North Haven campuses. The Sustainability Planning Committee, which McGinnis co-chairs, reviewed input from these town halls and presented the findings to President Judy Olian.

“It was important for us to have that community piece. It’s clear President Olian is interested in embedding sustainability through the entire culture of the university,” McGinnis said. “So what could that mean in terms of enhancing people’s health and wellness?”

“Maybe that’s having some gardens on campus to help bring down people’s stress and anxiety levels. We also talked about the phasing out of individual plastics and food sourcing.



Where does our food come from? That’s important, right? There are so many different ideas and objectives we can consider here.”

During the semester, students made three presentations and completed a signature work. On one particular day in February, Gabrielle Pena ’22, a biology major and anthropology minor, spoke to the class about invasive species such as zebra mussels, lionfish and bamboo.

“It’s hard to get rid of all these invasive species because there are so many of them,” Pena told the class, illuminated by a deck of PowerPoint slides. “A possible solution to this is education. People can limit their exposure to invasive species by washing their boots or doing a better job monitoring supplies that could carry invasive species.”

One person, one action, one outcome at a time. The message resonated across countries, cultures and 10 days of global engagement for these Quinnipiac students.

“I can think about sustainability in terms of science with all the trees, the water and the animals,” Murphy said one night in Costa Rica. “But it’s really the things we do as humans—the choices we make—that determine what’s going to happen in the future. The bananas don’t just magically appear in the store. They’ve got to be shipped from someplace. People have to grow them and pack them, but we don’t think about that. I think we need to start thinking about all those kinds of things a lot more.”

Angileri feeds one of the 26 different species of hummingbirds at the La Paz Waterfall Gardens and Animal Sanctuary.