

Fall 2023

**M** | SEAS

# Stewards

A MAGAZINE FOR ALUMNI AND FRIENDS OF THE SCHOOL FOR ENVIRONMENT AND SUSTAINABILITY  
AND THE PROGRAM IN THE ENVIRONMENT



Collaborating for a More  
**Sustainable Future**

Meeting the Future of  
Energy Access in Malawi

How a Warming World Could  
Affect Bird Development



## Meeting the Future of Energy Access in Malawi

Most rural Malawians lack access to sustainable and affordable modern energy services and products. SEAS Professor Pam Jagger, a political economist who focuses on poverty-environment dynamics in low-income countries, along with Professors Charles Jumbe and Thabbie Chilongo, development economists at the Center for Agricultural Research and Development at the Lilongwe University of Agriculture and Natural Resources in Malawi, are working together on several studies focused on energy access. Their collaboration produces research that is used to inform policy and program development in Malawi and in the East and Southern Africa region. Read our cover story on p. 10.

KAZIZILA VILLAGE, MALAWI, AFRICA. PHOTO BY DAVE BRENNER



## Dear Friends:

While the seasons shift and change, there's been one constant: We've all experienced extreme weather events exacerbated by climate change. Though it's easy to focus on the problems associated with our warming world, I prefer to look at our pressing environmental challenges with hope and optimism.



That's because we are at a pivotal moment in time—a transition into a new world where we are creating and implementing solutions for a just and sustainable future, including a clean energy world where ALL people and our planet can thrive.

Our entire SEAS community of alumni, students, faculty, staff and friends is empowered more than ever to halt the climate crisis and create an environmentally sound future for generations to come.

At SEAS and PitE, we are advancing action through research, engagement, innovation and expertise. We're all about impact and collaboration, a theme you'll see throughout this issue of *Stewards*, which focuses on big solutions like improving energy access in Malawi, addressing stormwater overflow in New York City and building climate resilience.

We only get one shot to save our planet for future generations. How lucky are we to be alive in this moment where we have the tools and solutions to make a difference? We all have a role to play and can take steps to make this happen. Talk about climate change in your own communities. Support climate action initiatives with your time and resources. Work to elect politicians who will lead on clean energy. And, most importantly, **don't lose hope.**

As always, I am grateful for your collective partnership and support.

*Peck*

Jonathan Overpeck  
Samuel A. Graham Dean and  
William B. Stapp Collegiate Professor of Environmental Education

P.S. Please join me in celebrating the **120th anniversary** of our beloved Dana Building, where countless dedicated students have pursued their passion for making our planet more sustainable and just. Happy birthday, Dana!



# M | SEAS Stewards

A magazine for alumni and friends of the School for Environment and Sustainability and the Program in the Environment.

Cover photo by Dave Brenner.

SEAS master's student Andrea Mahieu and Lilongwe University of Agriculture and Natural Resources researcher Alfred Magombo interview study participants in Kazizila Village, Malawi, about the ownership, use and impacts of solar technologies.

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- Project Manager** Katie Trevathan
- Writers** Lori Atherton, Jim Erickson, Nayiri Mullinix, Denise Spranger
- Design and Photography** Dave Brenner, Maddie Fox
- Printer** University Lithographers, Ann Arbor  
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**Contact Information**  
School for Environment and Sustainability  
University of Michigan  
440 Church Street  
Ann Arbor, MI 48109  
734-764-2550  
seas.umich.edu

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# A Vibrant Community

Without a doubt, the SEAS and PitE community works hard every day to advance our sustainability mission. But that doesn't mean we don't take time to play. Check out these photos from the past academic year to see the lighter side of our experiences.





Photos by  
Dave Brenner  
Maddie Fox









# Meeting the Future of

# ENERGY ACCESS IN MALAWI



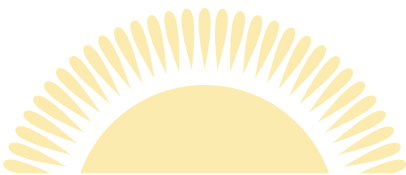
**W**hen the sun sets in Malawi each day, most rural Malawians use candles, torchlights and kerosene lamps to light their homes. From sunset to sunrise, between roughly 6 p.m. and 5 a.m., they socialize, do household chores and study in near-total darkness because they are living without access to electricity.

Malawi is one of the world's least-developed nations, with 70% of its population living on less than \$2.15 USD a day, according to the World Bank. Most Malawians experience energy poverty, meaning they lack access to sustainable and affordable modern energy services and products. Approximately 85% of Malawi's population of more than 20 million people have no access to electricity. Only 3% of Malawi's population have access to a clean fuel for household cooking.

"The depth of energy poverty for people living in Malawi cannot be overstated," says SEAS Professor Pam Jagger, a political economist who focuses on the dynamics of poverty and the environment in low-income countries.

For the past decade, Jagger has been collaborating with Professors Charles Jumbe and Thabbie Chilongo, development economists at the Center for Agricultural Research and Development at the Lilongwe University of Agriculture and Natural Resources (LUANAR) in Malawi. They have worked together on several studies focused on energy access.

The team has been supported by a five-year, \$4.79 million award from the National Science Foundation (NSF) Partnerships in International Research and Education (PIRE) program. This multi-institutional, multi-country project has enabled Jagger and her collaborators to study the effectiveness of different interventions designed to improve energy access. Most recently, they completed data collection for a study in rural Malawi exploring what



**Story by**  
Lori Atherton

**Photos by**  
Dave Brenner



SOLAR TECHNOLOGIES PROVIDE A SOURCE OF ELECTRICITY FOR SMALL BUSINESSES IN TRADING CENTERS. THIS ENTREPRENEUR USES SOLAR PANELS AND BATTERIES TO POWER HIS HAIRCUTTING AND PHONE CHARGING BUSINESS IN RURAL LILONGWE DISTRICT.

types of households are early adopters of solar technologies, what types of technologies they are using and the benefits they derive from them.

Solar power—which includes stand-alone solar panels and solar home systems or kits consisting of a solar panel, rechargeable battery/inverter, and light bulbs—is touted by nongovernmental organizations (NGOs), governments and the private sector as an affordable electricity solution for people living in places where there is no access to grid electricity now or in the foreseeable future.

“There is a very interesting trend happening throughout Africa where we’re seeing rapid take-up of solar technologies that are used for cell phone charging, lighting, and powering TVs, radios and stereo systems,” says Jagger,

who leads the Forest Use, Energy and Livelihoods (FUEL) Lab at SEAS.

Solar device ownership in Malawi increased from less than 1% in 2010 to 12% in 2020, with slightly higher usage of solar technologies among rural households than urban households, according to research by SEAS graduate Charlie Lindsey (MS/MPP ’22), who worked with Jagger and wrote his master’s thesis on the uptake of solar technologies in Malawi. “We learned from analyzing national household survey data that even though about 20% of rural households had solar technology, not all households were using solar energy for lighting,” Jagger says. “We wanted to know more about the primary energy services solar technologies provide, and what uses they have other than lighting.”



FROM LEFT: LONGTIME COLLABORATORS PROFESSORS THABBIE CHILONGO (LUANAR), PAM JAGGER (U-M) AND CHARLES JUMBE (LUANAR).



A REPRESENTATIVE OF VITALITE, A SOCIAL ENTERPRISE SELLING SOLAR PRODUCTS, SHOWS OFF SOLAR HOME SYSTEMS FOR SALE ON A PAY-AS-YOU-GO BASIS IN LILONGWE, MALAWI. THERE ARE APPROXIMATELY 20 SOCIAL ENTERPRISES SELLING SIMILAR SYSTEMS IN MALAWI.

The solar technology study involves a partnership with a social enterprise called VITALITE Malawi, a pay-as-you-go solar company that offers prepackaged solar home systems. In Summer 2022, Jagger and the LUANAR team conducted a baseline survey of 1,279 households in the Lilongwe District in central Malawi. The survey involved interviewing people in three groups: current users of VITALITE solar home systems; prospective users of VITALITE solar home systems; and control households (e.g., households with no solar technologies and no expectation of short-term adoption of solar technologies).

So far, Jagger and her team have analyzed the baseline data to see what energy services people are using solar energy for. With households that had solar lighting, they looked at how increased lighting from the solar technologies affects the households' time and quality of life, and if those additional hours of lighting were used for productive or leisure activities. Productive activities include household tasks, studying, childcare, cooking, community meetings, and other work or services, while leisure activities involve watching television, listening to the radio, worship/prayer, rest, exercise, socializing and personal hygiene.

The study team returned to the same communities and households in Summer 2023 after VITALITE had spent the year marketing solar home systems to the prospective-users group. Andrea Mahieu (MS '24), a SEAS master's student, joined the team as they revisited each household to complete an endline survey. In addition to learning who adopted new solar technologies between the baseline

and endline surveys and what types of solar products they obtained, they asked additional questions about the households' preferences related to solar energy use that were not included in the baseline survey, as well as more-detailed questions about their leisure time during hours of lighting in the household.

“We went back to observe any additional take-up of solar technologies, including solar home systems or kits, and to understand their impact and what people are doing with those additional hours of lighting,” Jagger explains. “Are their kids studying more, are people doing things related to their businesses or other economic activity? Or are people just enjoying having a source of lighting in their household?”

Their key findings from the baseline data collected in 2022 have been compiled into a report for VITALITE to share with the broader household energy community.

Jagger and her team found that households that own VITALITE solar home systems or kits have higher incomes, expenditures and more assets than the general population. They spend approximately \$2.45 USD per month on solar and \$7.85 USD per month on household energy compared to non-solar home systems owners who spend approximately \$1.81 USD per month on household energy.

“The top income quartile of Malawians are purchasing solar home systems or kits, which isn't a surprise,” says Jagger. “However, it illustrates the need to develop an alternative to purely market-based strategies for reaching households with lower incomes.”

Because solar home systems or kits offer greater availability of lighting, households that used the VITALITE solar home systems reported an extra three hours of light per night, according to the study. “Most of the people who adopt these systems go from no lighting to some lighting,” Jagger notes. The study also found that those same households also experienced an increased sense of security. While there is little crime in Lilongwe District, Jagger says, the households with solar-powered lighting reported feeling safer in their homes as a benefit of having the additional lighting.

Another notable finding is that households with solar home systems spend less time traveling to cell phone charging stations. People in rural Malawi often walk more



SOLAR TECHNOLOGIES ARE THE ONLY OPTION FOR DELIVERING HIGH-QUALITY LIGHTING TO HOMES IN MOST OF RURAL MALAWI. COMPANIES LIKE VITALITE SELL SOLAR HOME SYSTEMS THAT INCLUDE SOLAR PANELS, BATTERIES, WIRING AND LIGHT BULBS.

than an hour to get to a trading center or shop where a cell phone can be left to charge for a small fee. Cell phones, Jagger says, are essential for life in Malawi. More than 90% of households have a cell phone they rely on for financial transactions, business communication, and keeping in touch with friends and family. The time and money saved by having the ability to charge phones at home is a huge benefit to households, she adds.

Perhaps the biggest finding, though, is that households were using the increased lighting for leisure rather than productive activities, Jagger says. While the donor community and social enterprises such as VITALITE tout the potential for this type of energy solution as “having far-reaching impacts on education, health and productivity,” Jagger’s team found that their data didn’t support that claim. “It’s an important finding,” says Jagger, “because it shows there isn’t a lot of evidence to support the economic and human-capital benefits of solar technologies.”

Digging more into this observation will be a major focus of analysis of the endline data where even more households have solar technologies, according to Jagger.

“There is a lot of hope and expectation by NGOs and donor communities that when people adopt solar technologies in places where they’ve had no electricity access, they will instantly translate that time into starting new businesses or that children will be studying more,” says Jagger. “It’s a very economic way of thinking and, as it turns out, what we’re finding is that people are using that extra time for socializing or relaxing. Maybe they are just happy that they’re not sitting in the dark, which isn’t a benefit you can easily quantify in monetary terms. But it matters so much for quality of life, which more holistic measures of well-being consider.”

## Collaboration and Trust

Jagger and her LUANAR partners Jumbe and Chilongo began working together in 2004 as part of an international collaboration on forests and poverty led by the Center for International Forestry Research. They kept in touch over the years. Before joining U-M, Jagger was a faculty member at the University of North Carolina at Chapel Hill in 2013 when a fellowship opportunity became available to spend a year in Malawi studying how reliance on biomass for household energy impacts human health and well-being.



CHARCOAL IS THE MOST COMMON COOKING FUEL IN URBAN AREAS THROUGHOUT AFRICA. INCREASING URBANIZATION MEANS THAT THE DEMAND FOR CHARCOAL IS RAPIDLY GROWING. IN MALAWI, TENS OF THOUSANDS OF PEOPLE ARE ENGAGED IN THE CHARCOAL INDUSTRY AS PRODUCERS, TRANSPORTERS, TRADERS AND RETAILERS. EVERY DAY, THE ROADS LEADING INTO LILONGWE, MALAWI'S CAPITAL, ARE CROWDED WITH CHARCOAL TRANSPORTERS, SUCH AS THE MAN PICTURED ABOVE, WHO CARRY LOADS OFTEN EXCEEDING ~441 POUNDS BETWEEN DISTANCES OF 31 AND 50 MILES FROM THE FOREST WHERE CHARCOAL IS PRODUCED TO CITY MARKETS.

With her family in tow, Jagger spent a year living in Malawi, where she, Jumbe and Chilongo conducted two new studies: one focused on demand for fuel-saving cooking technologies in areas with high rates of deforestation, and a second on the relationship between exposure to smoke from cooking with fuelwood and charcoal and pulmonary tuberculosis. They also started research that combined remote sensing and national household survey data to understand the role that harvesting fuelwood and charcoal plays in deforestation and forest degradation patterns in Malawi. When Jagger returned to North Carolina, she was enthusiastic about continuing her partnership with Jumbe and Chilongo.

“Charles, Thabbie and I worked closely together for the period of a year and forged a lot of trust with each other,” Jagger says. “This has been a very rich and fruitful collaboration, and none of this work would be possible without the strong partnership we’ve built over the past 10 years, which I really value. We are lucky to have been generously supported by both the National Science Foundation and the National Institutes of Health for more than a decade.”

That relationship, along with the opportunity to continue to explore the connection between poverty and the environment, is why Jagger is compelled to return to Malawi—“the warm heart of Africa”—year after year.

## Energy-saving Stoves for Household Cooking

Between 2016 and 2022, Jagger, Jumbe and Chilongo conducted a study on a Government of Malawi program to improve energy access for ultra-poor households, an official designation used by the Government of Malawi as a threshold for providing government support. These households typically receive cash transfers as a form of social assistance.

Malawi is further behind other African countries in the energy transition, Jagger notes, and most Malawians rely on fuelwood or charcoal for their daily cooking needs. Because Malawi’s population is growing, especially in the southern region, there is an increased demand for fuelwood, which contributes to forest degradation and deforestation. “Southern Malawi is one of the most

population-dense places in Africa,” says Jagger, “and it has had significant issues with deforestation and forest degradation, particularly over the past 20 to 30 years, largely due to the clearing of forests to provide land for agricultural production.”

High rates of deforestation make it more challenging for households to devote time and energy to collecting fuelwood for cooking, Jagger adds. This is especially true for ultra-poor households. In an effort to address energy access for these households, the Malawian government, with support from United Purpose, implemented a program to distribute free energy-saving stoves to ultra-poor households in eight districts in Southern Malawi.

“

Close to 90% of households that were offered the free stove accepted it.”

Jagger, Jumbe and Chilongo designed a multi-year evaluation to understand the adoption, impacts and spillover effects of the program, which rolled out to over 100,000 households in 2017. The study involved data collection in three districts and involved repeated visits to 900 ultra-poor households in 16 communities and thousands of non-poor households in the same communities.

Jagger says they observed high rates of take-up with this program. “Close to 90% of households that were offered the free stove accepted it,” she says. “Leveraging the targeting of social cash transfer programs seems to be a highly effective way to get goods and services to ultra-poor households who generally do not have money to spend on improved energy technologies.”

Another interesting finding is that people cooked more when they had access to fuel-saving stoves, Jagger notes, which suggests that there is a food-security benefit associated with getting fuel-saving stoves to this particular population.

Something else they sought to understand was whether or not the adoption of improved cookstoves by ultra-poor households would encourage other households in the village to use them. “We measured what we called a spillover effect from this program, and found that the average spillover rate was 12%,” says Jagger. “This means



SEAS MASTER'S STUDENT ANDREA MAHIEU, LEFT, WORKS WITH A FIELD TEAM OF LOCALLY RECRUITED STAFF TO ADMINISTER A SURVEY ABOUT THE ADOPTION AND IMPACTS OF SOLAR TECHNOLOGIES IN KAZIZILA VILLAGE, MALAWI.

**U-M students have supported SEAS Professor Pam Jagger's energy poverty work in Malawi during the past several years. They include:**

**Olivia Howard**, U-M undergraduate student (lead author on a cyclone coping-strategy paper)

**Charlie Lindsey**, SEAS master's student (wrote a thesis on solar uptake in Malawi)

**Andrea Mahieu**, SEAS master's student (completed fieldwork in Malawi in 2023; writing a thesis using solar home systems study data)

**Congyi Dai**, SEAS PhD student (did analysis of solar home systems study data)

that an additional 12% of households within a village decided they would purchase a fuel-saving stove because they observed that it had potential benefits connected to it.”

Jagger says the study was slated to be wrapped up in 2019, but thanks to additional funding the project was extended for another year, though the pandemic put a halt on further data collection until 2022. That year, the research team revisited the same households for one last round of data collection, which provides an important longer-term perspective on the impacts of the program. The initial finding from the analysis of the 2022 data is that the food-security benefit remains over time and that a replacement plan needs to be built into the program because the stoves break after three to five years of use.







## Future Research

With the energy access projects focused on solar and clean cooking technologies wrapping up, Jagger is looking ahead to her next collaboration with Jumbe and Chilongo, which will address the linkages between poverty, health and environmental dynamics after extreme-weather events.

In March 2023, Tropical Cyclone Freddy struck Malawi, Mozambique and Zimbabwe, resulting in heavy rainfall, strong winds, flooding and massive infrastructure damage. In Malawi alone, more than 650,000 persons were displaced by the cyclone, according to the United Nations High Commissioner for Refugees.

“Cyclones are major disasters that have dire consequences for rural populations,” says Jagger, who saw the devastation caused by Cyclone Freddy during her recent trip to Malawi. “As a result of damage to water and sanitation infrastructure, health care service disruptions, human displacement and persistent flooding, Malawi is experiencing the largest cholera epidemic in recorded history.”

Jagger is seeking funding from the NSF’s Human-Environment and Geographical Sciences Program to study the types of environmental shocks that Malawians experience as a result of cyclones and other extreme weather events, and the coping mechanisms they’ve adopted for dealing with those shocks. ♡

SEVERAL MAJOR CYCLONES HAVE HIT SOUTHERN MALAWI IN RECENT YEARS. THEY BRING HEAVY RAINFALL, FLOODING AND STRONG WINDS. THE MOST RECENT, TROPICAL CYCLONE FREDDY, HIT MALAWI IN MARCH 2023, CAUSING MAJOR DAMAGE TO HOMES AND CROPS AND LOSS OF LIVESTOCK. MANY PEOPLE WHO HAVE LOST THEIR HOMES DO NOT HAVE THE RESOURCES TO REBUILD.



A ROBIN'S NEST HOLDS A BABY AND TWO EGGS.

# How a Warming World Could Affect Bird Development

Story by

Lori Atherton

Photos by

Maddie Fox

**T**he blue robins' eggs are nestled in straw, a pop of color against the brown cup-shaped nest. Next to the eggs lays a pink and featherless chick, only a few days old. On this early June day, SEAS master's student Isaac Smith (MS '24), who had been keeping watch over the nest like a proud parent, was encouraged by the sight. Baby robins in other nests had been preyed upon when their parents left them alone—a disappointing outcome of Smith's field research.

Smith, who focuses on avian conservation, spent two months from late spring to early summer at the U-M Biological Station conducting a nest-warming experiment

that he hoped would offer additional clues about how birds respond to climate change.

Placing specially designed heaters underneath the nests to simulate a warming planet, Smith wanted to see how heat would affect the size of birds during development. Would creating a warmer environment in the nest cause plasticity, resulting in the birds becoming larger or smaller, Smith wondered? Plasticity refers to how traits in birds may change in response to environmental factors, such as temperature or precipitation.

The research was conducted for Smith's master's thesis and ties into the larger research efforts of his advisor,

SEAS Assistant Professor Brian Weeks, an evolutionary ecologist who studies how bird species and bird communities adapt to environmental change.

Weeks looks at how rising temperatures impact the size and shape of migratory birds in North America. “We have found that increasing temperatures are making birds smaller, but we don’t know the mechanism underlying that relationship,” says Weeks. “It could be that when birds are warmed as they develop, they end up being smaller. So as the world warms, birds may get smaller just because of some fundamental aspect of their physiology.”

Birds are an important indicator of the health of different ecosystems because they are responsive to environmental change, are easy to observe and have important ecological functions. “We know there are massive impacts on bird morphology,” Weeks says, “so if we can figure out the reason for that change, we can likely figure out what other species are changing in the same way.”

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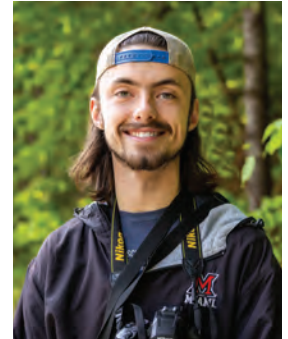
It could be that when birds are warmed as they develop, they end up being smaller.”

Smith was authorized to find the nests of six different bird species, including sparrows, robins and warblers, but he only discovered robins’ nests. Birds hide their nests well, Smith notes, so it’s possible the other species’ nests were on high perches he couldn’t see, or they were on property that he couldn’t access.

While previous studies have used nest boxes or incubators to warm the nests, Smith wanted to use a different approach for his study. “The only thing I wanted to change in the experiment was the temperature, so that’s why I warmed the nests that the birds had built,” he explains. “We thought it was important to do this experiment in the birds’ natural habitat because it’s most realistic to how Earth will be in 50 years.”

Of the nests that Smith found, half were used as control nests that were attached to heating devices that weren’t turned on. The other half were connected to heaters that warmed the inside of the nests to a constant temperature of 2 degrees Celsius—the warming threshold that climate change experts predict the world will reach unless global emissions are brought to pre-industrial levels.

Smith visited the nests each day to change the heaters’ power supplies and keep an eye on the eggs until they hatched. He then carefully checked the size and weight of the chicks daily for 11 days—all birds were handled with appropriate training and permits and without harm—though sometimes the chicks didn’t survive because they had been attacked by other birds, most likely ravens or common grackles.



ISAAC SMITH

“Something I learned about being up here is that field research comes with its own surprises,” says Smith, who was assisted in his fieldwork by U-M undergraduate student Mark Ziebell. “I didn’t think predation would be as much of an issue as it was, but it was definitely a challenge we faced and couldn’t control.”

Preliminary findings from Smith’s research show two things: 1) The warming treatment worked—the warmed nests were about 2 degrees Celsius warmer than the control nests on average, and 2) A trend that is in line with his hypothesis shows that birds in warmed nests were smaller on average and developed at different rates than those in control nests.

“It is likely that long-term changes in morphology are driven not only by plasticity, but also by natural selection,” says Weeks, who is continuing to delve deeper into the research statistics and data analysis with Smith.

Smith’s work is complemented by ongoing research conducted by Tiffany Dias, a SEAS PhD candidate in Weeks’ lab who is exploring genetic changes through time. By sequencing whole genomes of bird specimens collected over the past 40 years, Dias will test whether there are specific genetic sequences associated with differences in size and then will quantify changes in the frequency of those sequences through time. Together, Smith and Dias’ work will give a picture of the relative contributions of plasticity and natural selection in driving climate-associated changes in morphology. ♣

*Smith and Ziebell’s fieldwork at the U-M Biological Station was supported by the Nancy and Doug Schrank Summer Research Assistant Fund, as well as by the David and Lucile Packard Foundation.*

# Pieces of the Climate Resilience Puzzle:

## Social Connectivity, Emotional Well-being, Positivity and Hope

**Story by**

Nayiri Mullinix

**Photo by**

Maddie Fox

**D**ue to human-driven climate change, it's predicted that in the coming years, global temperatures will surge to record levels. Already, people all around the world are dealing with daunting new challenges, and while cutting heat-trapping emissions is key, there are some impacts that are now unavoidable. This is where climate resilience—the ability of social, economic and ecological systems to cope with the impacts of climate change while preventing it from getting worse—comes into play. The social aspect of climate resilience has been the focus of Jess Lasoff-Santos' research at SEAS for nearly 10 years, both while pursuing a master's degree and a PhD which he will defend later this year.



Lasoff-Santos says he was introduced to the field of environmental psychology soon after he received his undergraduate degree and his interest was immediately piqued. From there, it took one Google search, for “environmental psychology master’s,” to find his way to SEAS. “I was focused on environmental communication but, as a fellow, ended up working with a postdoc who was engaged with environmental psychology,” says Lasoff-Santos. “I just thought it was the coolest thing. And then they gave me a seminal paper written by [SEAS Associate Professor] Raymond De Young, and I was hooked. I was so nervous and excited to meet him.”

This chance introduction to the field of environmental psychology led Lasoff-Santos to specialize in Behavior, Education and Communication, and he says his research interests have evolved from there. “The studies I’ve conducted since coming to SEAS have often been as a result of conversations with Professor De Young about the way things are going and the need to help people engage with their communities and, in doing so, help them help themselves psychologically, such as dealing with climate distress,” says Lasoff-Santos. “It’s a real thing that will become more and more common as folks begin to feel the effects of climate change, which is why working on climate resilience is so important.”

While pursuing his master’s degree, Lasoff-Santos worked with De Young on a study about intentional agricultural communities—which are groups of people who have decided to live on a shared property centered around growing their own food. Overall, he says that they were interested in looking at how engagement with local food systems impacted people’s lives. The findings were mixed, but, in general, they revealed that people in these types of communities tended to have a high sense of social connectivity and psychological well-being, and that they were contributing to the greater good.

“There’s limited research on folks living in agricultural intentional communities. Our paper is pretty much where it begins,” says Lasoff-Santos. “We were looking specifically at intrinsic motivation—doing something for the inherent satisfaction rather than external praise or rewards—which people in these communities exhibited a high level of when it came to community food. They were living and working with people who had similar social values, environmental concerns, etc., and demonstrated signs of well-being in other lifestyle areas.”

The findings also reflected something that would inspire Lasoff-Santos to hone his research on climate

resilience, which was the fact that the people living in the agricultural intentional communities had more positive feelings about their abilities to combat climate change. “This indicated that they felt they were contributing in some way to mitigating the climate crisis, and I wanted to investigate this further,” says Lasoff-Santos.

As part of his PhD research, Lasoff-Santos has looked at people who work in municipalities across the U.S. doing climate change mitigation and adaptation work, which has revealed some common threads, including the importance of collaboration and connectivity. “A key finding of my recent research is that, ideally, folks working in climate adaptation and resilience fields should come together to collaborate and come up with a common definition of ‘climate resilience’ so they are working toward the same goals,” says Lasoff-Santos. “This type of connectivity leads to more productive outcomes.”

Another study, also focused on municipal government, revealed that different forms of climate resilience planning can affect the psychology of the municipality’s residents. “We found that community-centered and participatory planning produced a higher level of confidence in their own knowledge about how to protect themselves from climate change,” says Lasoff-Santos. “Essentially, people who believe in climate change and in their own abilities to handle it have higher positive feelings toward climate change.”

Generally speaking, Lasoff-Santos says that lowering extreme levels of climate distress can make people more likely to engage in pro-environmental behaviors. “In short, in post-disaster recovery—including in the aftermath of climate-related impacts—social connectivity, emotional well-being, positivity and hope all matter,” says Lasoff-Santos.

De Young, who leads the SEAS Environmental Psychology Lab, where Lasoff-Santos is the manager, says this type of research is especially important for adapting to the climate crisis. “What Jess is working on is an expanded notion of adaptation. He moves beyond the current concept of adaptation where we primarily alter existing physical systems and infrastructure so that they might, for a time, survive the climate crisis. His research revives a classic psychological form of adaptation where our responses do not try to alter, but rather accommodate, reality. His work is aimed at helping people change their expectations, sense of entitlement and life patterns to better fit the new reality.”



# 'Daylighting' NYC's Tibbets Brook

MLA Alumna Helps Unearth Stream from  
1912 to Combat Stormwater Overflow

Story by  
Lori Atherton



**T**ibbetts Brook, a long-buried stream in New York City that flows from Yonkers to the Bronx, soon will be resurfaced above ground as part of an ambitious daylighting project that will reduce the city’s combined sewer overflow (CSO) into the Harlem River.

Daylighting is the process of restoring a stream to its natural state by removing any obstructions covering it, such as concrete or pavement, according to the New York City Department of Environmental Protection (DEP), which is responsible for managing New York City’s water supply. It is spearheading the Tibbetts Brook Daylighting Project at a cost of \$130 million.

“New York City is an island, surrounded by water and most of it former salt marsh that was once fed by tidally influenced streams and tributaries. Much of the city wants to be wet,” says SEAS landscape architecture graduate Amy Motzny (MLA ’15), section lead in climate and equity at DEP who is serving as the Tibbetts Brook project manager. “The area was originally long inhabited by the Lenape people, who cultivated the fertile marshland for food production. When European settlers began to colonize the region, the land was manipulated—for trade, manufacturing and urbanization as we know it today.”

During urbanization, Motzny says, many of New York City’s historic waterways were channelized and put underground in pipe systems, becoming part of the combined sewer system, including Tibbetts Brook. Through this system, Tibbetts Brook currently discharges into the Harlem River, one of the waterways in the city that is most impacted by CSO.

TIBBETTS BROOK WAS DAMMED IN THE 18TH CENTURY TO CREATE A POND THAT STILL EXISTS IN VAN CORTLANDT PARK. PART OF THE BROOK WAS BURIED UNDERGROUND AROUND 1912. PHOTO CREDIT: GREGG VIGLIOTTI FOR THE NEW YORK TIMES

DEP has implemented more than 11,000 green infrastructure projects, including bioswales and rain gardens, throughout the city that are designed to intercept stormwater and reduce CSO, Motzny notes, but Tibbetts Brook is considered our “largest and most ambitious project to date.”

Combined sewer overflow occurs when stormwater overwhelms the sewer system during wet weather events. Most major

cities, including New York City and Detroit, use a combined sewer system that collects rainwater runoff, sewage and industrial wastewater into one pipe that is designed to flow

to a wastewater treatment plant, where it is treated and safely discharged back into nearby waterbodies, according to Motzny.

“Within NYC, there are approximately 1.4 billion gallons of flow per day to wastewater recovery facilities,” Motzny notes, “and there are 14 wastewater treatment plants that take wastewater, treat it and safely discharge it to the local waterways. Our sewer network includes 7,400 miles of pipes.”

During heavy rainstorms, which are occurring with more frequency and severity because of climate change, combined sewers receive a higher-than-normal amount of stormwater, which overtaxes the sewer system and causes a mix of stormwater and untreated sewage to flow directly into rivers, streams or other bodies of water.

The Tibbetts Brook project is estimated to reduce CSO into the Harlem River by about 220 million gallons per year, says Motzny.



AMY MOTZNY



“

It’s an opportunity to expand the way in which New York City has been pursuing green infrastructure over the last 10 years.”

Daylighting Tibbetts Brook—part of which was buried underground in 1912—involves removing the pipe and opening the stream, which will become an open channel that will collect and hold stormwater flow, Motzny says. The project will begin in the Bronx in Van Cortlandt Park, then move south for more than a mile before connecting to a larger greenway system that crosses a former railroad corridor owned by CSX Transportation.

The greenway is a major piece of the project, Motzny says, and will be a rails-to-trails park like The High Line, a public space built on a historic freight rail line elevated above the streets on Manhattan’s West Side and where visitors can experience nature, art and design.

“Tibbetts Brook is such an exciting project because it’s so innovative,” enthuses Motzny, who was introduced to the concept of daylighting at SEAS. “It’s an opportunity to really expand the way in which New York City has been pursuing green infrastructure over the last 10 years, and that’s what I find most inspiring about it: It has an

amazing benefit of reducing combined sewer overflow while serving as a beautiful park—providing numerous co-benefits that people will enjoy.

“And while we have a lot of amazing parks in New York City,” she adds, “we still don’t have enough parkland to serve the population of the city, particularly in environmental justice areas, which includes much of the Bronx.”

The daylighting project is set to begin construction in 2025 and will be completed by 2028. It’s an ambitious timeline, Motzny concedes, and one that is being driven by state and federal government regulatory requirements to be compliant with the Clean Water Act.

A large part of Motzny’s role as project manager involves coordinating with engineers and other landscape architects at DEP, an agency that employs more than 6,000 people, as well as outside entities, including the New York City Department of Parks and Recreation,





(ABOVE) A RENDERING OF W. 234TH STREET IN THE BRONX LOOKING NORTH AND (LEFT) A RENDERING OF VAN CORTLANDT PARK LOOKING NORTH, AS THEY WILL APPEAR AFTER COMPLETION OF THE TIBBETTS BROOK DAYLIGHTING PROJECT. IMAGE CREDITS: NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

the New York city and state Department of Transportation, and CSX, the railroad company that owns the property that will become the Tibbetts Brook greenway.

Since graduating from SEAS, Motzny has devoted her career to stormwater management in New York City. Much of her work at DEP builds upon her previous experience at Gowanus Canal Conservancy, a grassroots organization in Brooklyn that fosters community stewardship of the Gowanus Watershed.

Motzny was a watershed senior planner at Gowanus, where she led the creation of a master plan to rezone the neighborhood surrounding the Gowanus Canal, a Superfund site, from industrial manufacturing to residential mixed-use. Motzny worked closely on one of the rezoning conditions that involved net-zero combined sewer overflow, which meant that any new development would not contribute additional sewage into the Gowanus Canal and surrounding waterways.

SEAS, says Motzny, was instrumental in giving her a strong foundation in place-based work and regional watershed planning. “So much of my coursework was directly set in Detroit, a city facing water challenges, and it gave me the



(ABOVE) A MAP HIGHLIGHTS THE SCOPE OF WORK FOR THE TIBBETTS BROOK DAYLIGHTING PROJECT. IMAGE CREDIT: NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

opportunity to not only connect with the land, but with the people and the communities,” says Motzny, who brings those same place-based experiences into her assistant professorship at the Pratt Institute Graduate Center for Planning and the Environment, where she teaches a Sustainable Communities course and a Green Infrastructure Studio.

“My time at SEAS really gave me the tools to be able to participate in different types of conversations and solve multifaceted problems,” Motzny says. “My advice for students would be to gain a little exposure to everything, because you will use it.”

4 Questions:

# Cedric Taylor

*SEAS Visiting Associate Professor Cedric Taylor is a sociologist and documentary filmmaker who focuses on racial health disparities, environmental justice and visual sociology. He is the director and co-producer of “Nor Any Drop to Drink: Flint’s Water Crisis.”*



### **What got you interested in using film and visual media as a means of bringing wider attention to racism and environmental justice?**

When I graduated from the University of the West Indies, I knew that sociological thinking and approaches had the capacity to reform, if not revolutionize. I wanted my work to inform public debate and shape policy around social justice issues. I long had a passion for film, but it was at Michigan State University that I began to develop an appreciation for how visual sociology and, more particularly, documentary film could be part of a more “public-facing” sociology. When the Flint water crisis began to emerge in the public consciousness, I felt that a documentary film produced with a sociological sensibility would be important. I wanted to produce a film that emphasized social, economic and racial context rather than mere sensationalist aspects of the water crisis. A sociological approach could illuminate the environmental injustice and the systemic and structural nature of racism at play in the crisis, but documentary film could make these concepts real to a non-academic public.

### **You're working on a documentary about COVID in the Latina community. What can you tell us about it?**

Most of us feel like we have a pretty decent understanding of the Flint water crisis. But the film “La Placita” might challenge what we think we know, at least somewhat. It highlights the stories of Mexican immigrant women who attend English as a Second Language classes in the attic of a church in Flint. Stories are shared (mostly in Spanish) about their coming to America and the structural challenges they face, particularly in the context of the Flint water crisis. For example, many families learned that the water was contaminated several months after everyone else in the city. Some families heard about the poisoned water only after being informed by their relatives back in Mexico. The documentary is being done in collaboration with the Genesee County Hispanic Latino Collaborative, ACE Community Health and Emily Feuerherm of U-M Flint. It hopefully will be completed in Summer 2024.

### **What are students learning and doing in your documentary film course?**

The course uses the Benton Harbor water crisis as a case study, which provides hard lessons about the impact of racism, aging infrastructure, depopulation and deindustrialization. The documentary also highlights

the activism among predominantly Black and poor citizens who have been historically counted out.

SEAS and PitE students are being introduced to various aspects of documentary filmmaking. Finding and developing a story, interviewing, cinematography, lighting, sound, editing and navigating ethical issues are all part of the curriculum. They are engaging with a Benton Harbor community that is excited that U-M cares about what happened to them. As a class, we try to make our way down to Benton Harbor about twice a semester.

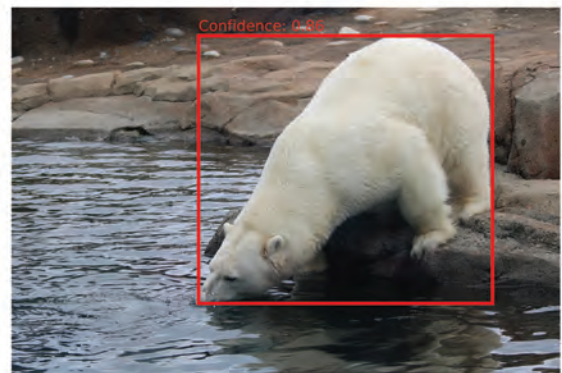
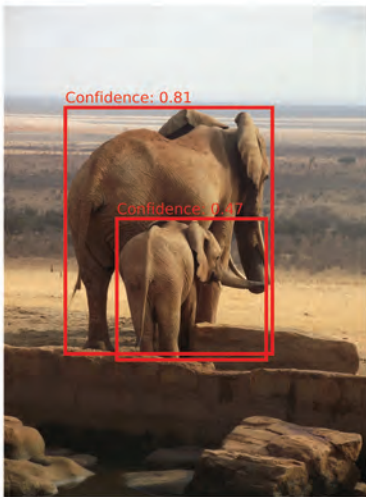
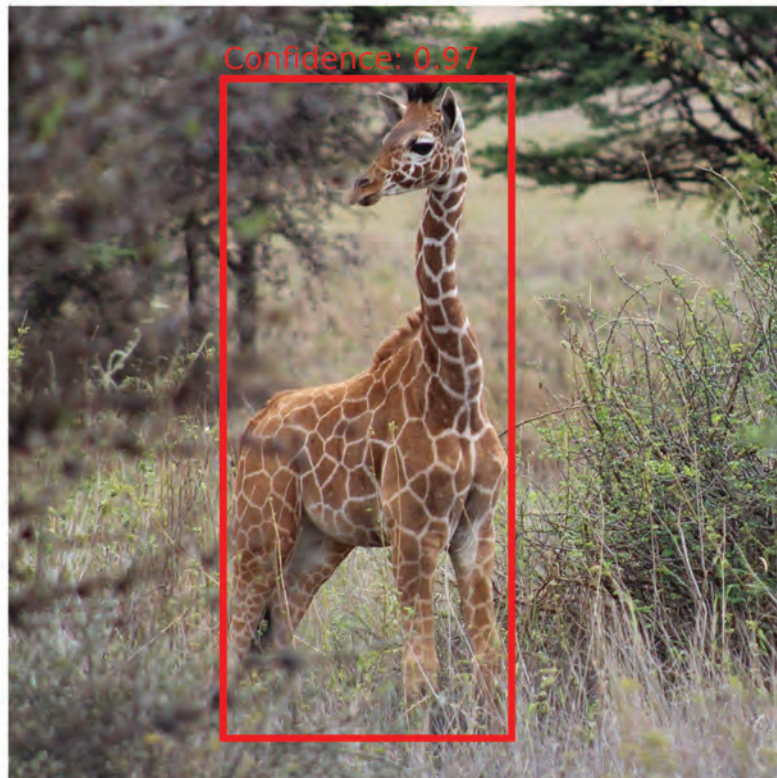
I anticipate that “A Benton Harbor Story” will be completed in Spring 2024. However, completing a quality film, on time, will require funding, particularly for travel expenses, sound design, music licensing and production roles that students can't cover. I also see this project as a template where SEAS partners with communities to tell environmental stories. But establishing a sustainable model for future projects also will require significant funding to cover production costs.

### **You recently became an American citizen—congratulations! How does being Jamaican influence your work?**

Thank you! I'm thankful and proud when I look back at a journey that wasn't easy. It could have turned out differently. I'm really lucky. My Jamaican background, of course, has influenced my work significantly in a few ways. First off, there is a strong tradition of storytelling in Jamaica. The stories you hear growing up are the currency of our collective experience and are repositories of generational wisdom. Throughout colonialism and post-independence, stories have played a role in our understanding of ourselves as Jamaicans. There is power in storytelling because it, among other things, can validate and heal. It was also in Jamaica that I first saw how documentary film could be a great vehicle for storytelling. “Life and Debt” (2001), directed by Stephanie Black, focused on the impact of globalization and austerity policies imposed on Jamaica. I grew up hearing the International Monetary Fund and World Bank being discussed around the dinner table. I had some awareness that our lives were being impacted by decisions by these entities. But it wasn't until I watched “Life and Debt” as a student at the University of the West Indies that it all came together for me. That film made me fall in love with documentary film as an art form. To this day, if you were to watch that film and then watch what I have produced, you can see the influence.

# Using AI to **Accelerate** Wildlife Conservation Efforts

Story by  
Nayiri Mullinix



**A**lthough artificial intelligence (AI) programs were first developed decades ago, they made an undeniable splash in 2023. Now, researchers at SEAS, alongside collaborators in the U-M School of Information, are focused on laying the groundwork for using AI to accelerate wildlife conservation efforts using social media.



NATHAN FOX

Nathan Fox, a SEAS and Michigan Institute for Data Science postdoctoral fellow, is an environmental scientist who is one of 10 researchers in the 2023 cohort of the Eric and Wendy Schmidt AI in Science Postdoctoral Fellowship. Fox is working with SEAS Assistant

Professor Derek Van Berkel and Associate Professor Neil Carter to use geolocated imagery from social media to complement and enhance existing conservation datasets.



DEREK VAN BERKEL

“We want to fill in the blanks in datasets that we already have. Maybe we’ll find images of a species outside of the range of where we knew it to be, and then we can start to understand why they moved, say, further north, because of climate change,” says Fox. “This could lead us to focus conservation efforts

in a different area since the information we’re gaining from social media shows a different picture than what traditional methods were showing.”

In traditional conservation science, maps are used to track where animals are located, but with social media and AI, the research team uses spatial modeling to predict where habitats are or where they might

be moving. As part of Fox’s two-year fellowship, he is training computer vision models to pick up on specific wildlife characteristics and provide probability guesses. Carter says this work will contribute to wildlife conservation in a way that’s never been done before.



NEIL CARTER

“This is a brand-new scientific endeavor where we’re at the early stages of defining the problem and refining an approach to tackle that problem. We have a sense that there are potentially

transformative areas here,” says Carter. “So this work can bring new tools, potentially extremely powerful ones, to bear on a set of growing sustainability challenges.”

Van Berkel adds that this work would be challenging without the use of AI. “Early on, we were looking at photographs manually. So, if you have a set of 50 million photos, you can only look at a sample of say, 500,” says Van Berkel. “As with anything else, there are still some limitations, such as what types of wildlife are often excluded from imagery posted on social media, but with AI, and computer vision in particular, we have an amazing opportunity to use all of the readily available data to map and identify trends in wildlife and watch how they change over time due to climate change and other circumstances.”

*The Eric and Wendy Schmidt AI in Science Postdoctoral Fellowship is part of Schmidt Futures, a global partnership that aims to apply artificial intelligence to research in science, technology, engineering and mathematics in an effort to accelerate the next scientific revolution. U-M is one of nine universities selected to join the fellowship program. Bill Currie, SEAS professor and associate dean for research and engagement, is co-principal investigator on the Schmidt Futures award and co-director of the fellowship program.*

(LEFT) AI-IDENTIFIED ANIMALS: NATHAN FOX TRAINED AN AI MODEL TO DETECT ANIMALS IN PHOTOGRAPHS. THE RED BOUNDING BOX HIGHLIGHTS WHERE THE ANIMAL IS DETECTED, AND THE PERCENTAGE SHOWS HOW CONFIDENT THE AI MODEL IS IN ITS ACCURACY. IMAGE CREDITS: NATHAN FOX AND VICTORIA STOODLEY



DREW GRONEWOLD

# Faculty Perspective: The Future of Water in a Changing Climate

**S**EAS Associate Professor and hydrologist Drew Gronewold is interested in understanding natural and anthropogenic forces (including climate change and changes in different rates of water use) that impact water supplies and water levels across Earth's large lakes and freshwater systems. His work focuses on the water balance of the Laurentian Great Lakes, which involves understanding not only changes in water use within the Great Lakes Basin, but also how changes in water use outside the Basin might impact continental water distribution over the next several decades. His research also involves looking at changes in water use and water-use policy along the Colorado River, Rio Grande/Bravo, Ogallala Aquifer, and other major continental surface and subsurface freshwater resources.

## You visited western Arizona last spring. Why did you travel there, and what were some of your key takeaways?

I traveled to the Colorado River and western Arizona to immerse myself in the arid environment and see in person the extraordinary infrastructure put in place (much of which is defined by the Central Arizona Project, or CAP) to transfer water from the Colorado River to large cities in Arizona (including Phoenix and Tucson) and California. I traversed significant portions of the CAP by bike and on foot and, along the way, interviewed water supply management representatives about their role in the water distribution system and their perspectives on the future of water use in the arid southwest. One of the key takeaways

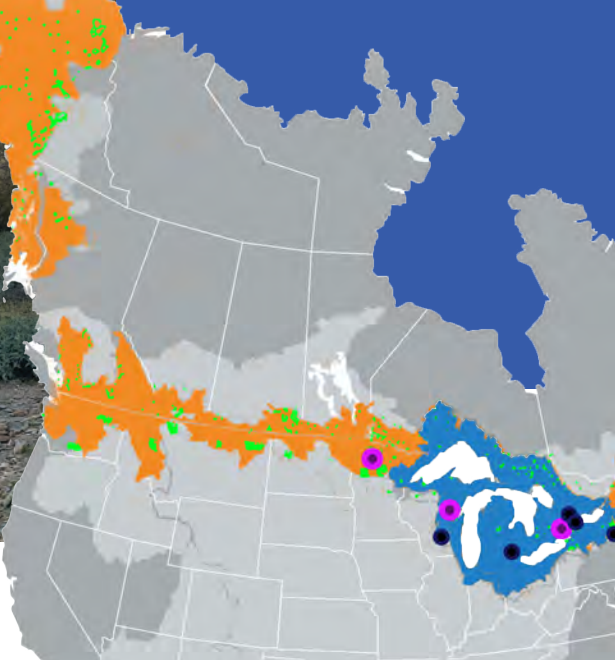
is that humans seem willing to do an awful lot (through economic and infrastructure investments) to move water over long distances. Another is that growth rates and human behavior in the region don't seem to reflect what might otherwise be thought of as a growing water crisis.

## How is the problem with the Colorado River connected to the Great Lakes?

There is a looming question in this country about how we are going to continue to provide a growing population with water when there are areas in which there are diminishing supplies of fresh surface and groundwater, while at the same time there are areas of water abundance. The Great Lakes Basin and the Colorado River Basin not only are two of the largest freshwater basins on the continent, they also characterize those two extremes. So, there is a logical series of questions that connect these two basins regarding whether people will need to move to get to freshwater, or whether technology will be used (through, for example, desalination or massive distribution infrastructure) to bridge the gap.

## How is climate change affecting the Great Lakes?

There have been multiple studies on how climate change has been affecting, and might continue to affect, the Great Lakes. The studies that focus on Great Lakes water supplies and water levels suggest that climate change is causing a long-term increase in the total amount of water coming into the Great Lakes through precipitation, but also (on average) more water loss through evaporation. So, we're



LAKE PLEASANT (A PORTION OF WHICH IS VISIBLE AT LEFT IN THE PHOTO ABOVE) IS ONE OF MANY IMPOUNDMENTS DREW GRONEWOLD VISITED DURING HIS FIELD WORK IN WESTERN ARIZONA WHERE WATER MANAGEMENT AUTHORITIES ARE BALANCING DIMINISHING SUPPLIES WITH REGIONAL DEMANDS FOR FRESHWATER. PHOTO CREDIT: DREW GRONEWOLD

finding that climate change may not cause average Great Lakes water levels, over multi-decadal periods, to be dramatically different from their historical long-term average. There is reason to believe, however, that there might be changes in shorter-term water level variability, particularly when considering more intense storms and diminishing coastal ice cover.

### What are transboundary water rights, and why do they matter?

One interpretation of transboundary water rights is that they govern how water can be used by citizens and industry when the natural features that differentiate freshwater boundaries (including watersheds and aquifers) don't align with political boundaries. These rights matter a lot because they help define how water is shared among communities. Ideally, these water rights would help ensure that sharing is done in an equitable way.

### What is the Great Lakes Compact, and is it time to reimagine it?

The Great Lakes Compact, more formally known as the Great Lakes–St. Lawrence River Basin Water Resources Compact, is an agreement between the eight states that border the Great Lakes. There is also a companion document, known as the Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement, which was signed jointly by the eight Great Lakes states and the provinces of Ontario and Quebec. These documents collectively accomplish several objectives, including economic development through conservation and efficient use of water across the basin, a general ban (with limited exceptions) on new diversions of water from the basin, and guidelines for reviewing applications for exceptions to the ban.

The Great Lakes Compact is an extraordinary document that was ratified by the U.S. Congress and became law in 2008. Even though it was enacted only 15 years ago, the continental water scarcity and abundance context in which the compact was created continues to evolve. It may not be necessary to change anything about the Great Lakes Compact, but I do think it's important for residents of the Great Lakes to continually learn about its origins and to be cognizant of potential threats it might face in the future.

## NEW CENTER TO STUDY CLIMATE CHANGE IMPACTS ON WATER RESOURCES ACROSS BORDERS

The National Science Foundation announced a \$5 million award to U-M for the Global Center for Understanding Climate Change Impacts on Transboundary Waters, an international effort to strengthen the climate change resilience of vulnerable communities that span international boundaries and jurisdictions. Partners in the project include Cornell University, the College of Menominee Nation, the Red Lake Nation and the University of Wisconsin. Housed at SEAS, the center will initially focus on climate change adaptation in the Great Lakes region—with an emphasis on Indigenous communities—and will expand its work to other North American multinational watersheds and beyond. It will be led by SEAS Associate Professor Drew Gronewold as its principal investigator.

ABOVE: THE NEW GLOBAL CENTER WILL DRAW ON RELATIONSHIPS AND POLICIES FROM TRANSBOUNDARY WATERSHEDS AND INDIGENOUS TERRITORIES ALONG THE ENTIRE U.S.-CANADA BORDER (ORANGE AND GREEN REGIONS, RESPECTIVELY). THE GREAT LAKES BASIN (BLUE) SERVES AS AN INITIAL AREA OF FOCUS. DIRECTLY FUNDED PROJECT PARTNERS ARE IDENTIFIED AS BLACK DOTS, WITH INDIGENOUS PARTNERS HIGHLIGHTED BY A PURPLE RING. ALL OF NORTH AMERICA'S TRANSBOUNDARY BASINS ARE HIGHLIGHTED IN LIGHT GREY FOR REFERENCE.

IMAGE CREDIT: SEAS AND OFFICE OF THE U-M VICE PRESIDENT FOR RESEARCH

# Addressing the Growing Wildfire Problem in Chile

Story by  
Nayiri Mullinix

FIREFIGHTERS WORKED TO EXTINGUISH FLAMES ALONGSIDE A ROAD NEAR NACIMIENTO, CHILE, IN FEBRUARY 2023. WILDFIRES SPREAD IN SOUTHERN AND CENTRAL CHILE EARLIER THIS YEAR, TRIGGERING EVACUATIONS AND THE DECLARATION OF A STATE OF EMERGENCY IN SOME REGIONS. (AP PHOTO/MATIAS DELACROIX)





In early 2023, wildfires were raging in Chile. In about a month, the country, which has suffered from a megadrought since 2010, saw more than 1,100,000 acres burn, destroying hundreds of homes and farms and killing 24 people. It's not unlike what the U.S. has experienced with more frequency in recent years, particularly in the western part of the country. In fact, SEAS Associate Professor Paige Fischer says that when it comes to how climate change is impacting wildfires, the U.S. West and Chile have quite a bit in common.

For Fischer, whose research has mostly focused on the Western U.S., this parallel was intriguing, so she decided to spend some of her sabbatical in Chile looking at the emerging wildfire issues. Funded by the Fulbright U.S. Scholar Program, Fischer spent three months at the Southern University of Chile collaborating with the Center for Fire and Resilience of Social-Ecological Systems (FireSES). While there, she gave talks, conducted exploratory investigations and co-taught a class she also teaches at SEAS.



PAIGE FISCHER

“The situation in Chile is complicated, and I wanted to have the opportunity to offer insights from the U.S. experience as they figure out how to adapt to wildfire risk,” says Fischer. “In general, wildfires in Chile are human-caused, so I hope to provide greater insight and bring the Chilean case into the global discussion about the wildfire problem.”

Fischer says that FireSES has similar goals as the Kathy and Steve Berman Western Forest and Fire Initiative at SEAS, which she leads. Both groups are studying the landscape conditions that can fuel wildfires and ways that people can change how they live to make landscapes less flammable.

“One of the major issues that has exacerbated the situation in Chile is the planting of highly flammable non-native plant species—mainly pines and eucalyptus—in the last 50 years or so,” says Fischer. “There’s a substantial export market for the wood from these plantations. The problem is that now the plantations are drying out and becoming very flammable. So, in some ways, Chile is creating its own hazard by cultivating these flammable tree species.” Since the plantations are owned by national and international corporations, there is very little communities can do to reduce the risk that surrounds them, Fischer adds.

Fischer says that in Chile and across the globe, there needs to be an understanding of these conditions in addition to the complex systems that increase wildfire risk. “It’s an environmental disaster in Chile. Whole communities have been decimated by fires, so you can drive for an hour through a single burn and it will be completely charred as far as the eye can see.

“I hope that my work, alongside my colleagues in Chile, can influence change on the ground and help Chile and its communities better adapt to the changing environment to prevent future fires. We are aiming to identify critical points for policymakers so the burden isn’t entirely on communities to mitigate these issues, because it shouldn’t be.”



# THE WEINBERG INFLUENCE:

## Giving SEAS Students a Career Boost

**A** philanthropic spirit was instilled in longtime U-M donor Marshall M. Weinberg (BA '50) by his parents. His father, who owned a garment business, wrote a book for Weinberg and his brothers that served as a blueprint for how to live a good life by helping others.

Weinberg took the advice to heart. The businessman, humanitarian and philanthropist established the Marshall Weinberg Endowed Fellowship Fund at SEAS in 2002 to help future sustainability leaders. The fund provides SEAS students with financial support for fellowships, internships and special projects.

During the past 21 years, 194 SEAS students have collectively received more than \$862,000 in financial support, which has enabled them to gain valuable sustainability experience and skills they might not otherwise have gotten.

“Marshall is one of the biggest-hearted alumni I know,” says Jonathan Overpeck, Samuel A. Graham Dean and William B. Stapp Collegiate Professor of Environmental Education. “He has provided meaningful counsel to SEAS deans for years, and he has shared his generous financial support with generations of SEAS students. We all have benefited from his exceptional philanthropic example, and I’m grateful for his long-standing support of our school.”

Weinberg, who lives in New York City, began his career at Herzfeld & Stern, a New York investment firm. His philanthropy focuses on higher education, international justice and reproductive rights. In 2008, Weinberg received the David B. Hermelin Award for Fundraising Volunteer Leadership, the university’s most prestigious award for volunteers. He received an honorary Doctor of Laws degree from U-M in 2014.

Highlighted at right are some of the organizations where

Weinberg Fellows are placed, as well as some current employers of Weinberg Fellowship recipients.

### Weinberg Internship Placements

- U.S. Senate
- U.S. Embassy in Zambia
- World Resources Institute
- U.S. Fish and Wildlife Service
- Defenders of Wildlife
- Centre for Sustainable Healthcare
- ForestAction Nepal
- SPOUTS International
- Friends of the Rouge
- City of Ann Arbor Office of Sustainability and Innovations

### Current Employers of Weinberg Fellowship Recipients

- Attorney and Advisor, Office of General Counsel, U.S. Environmental Protection Agency
- Carbon Reduction Research Scientist, Amazon
- Foreign Affairs Officer, U.S. Department of State
- Lead Ecologist, The Wilderness Society
- Senior Policy Coordinator, Greater London Authority
- Director of Sustainability, City of Detroit
- Biologist, U.S. Army Corps of Engineers
- Environmental Justice Program Manager, National Wildlife Federation
- Assistant Director, Energy & Climate Equity, New York State Energy Research and Development Authority
- Sustainable Production Program Manager, NBCUniversal

# Liesl Eichler Clark to Lead Climate Action Engagement

*As U-M's first director of climate action engagement, Liesl Eichler Clark is leading an initiative aimed at linking the university's expanding sustainability research, collaborations and engagement with external partners to accelerate climate action in Michigan and beyond. Clark previously was the director of Michigan's Department of Environment, Great Lakes and Energy (EGLE).*

## What is exciting about this role?

My career has been split between the public and private sectors working to solve the toughest challenges facing our future: climate change and decarbonizing our economy at the lowest possible societal cost. Finding new solutions with a different lens—that of the university—is appealing to me. I'm deeply curious, and I couldn't pass up an opportunity to learn from faculty doing cutting-edge research. I am compelled by SEAS' systems approach, which is critical given the interdisciplinary nature of the challenge. And I have always found students to be one of the best sources of enthusiasm, particularly their ability to see paths forward that may not be apparent to others.

## Why should U-M engage with external partners to solve climate change?

There is incredible urgency to this work. We experienced the hottest summer on record and incredibly expensive—in human lives and in monetary measurement—weather disasters. These occurrences will pick up speed as Earth reaches a tipping point. U-M broadly and SEAS specifically bring many parts of decarbonization solutions to bear. The necessary step is to encourage that work, link it across U-M, and support external engagement in Michigan and beyond so that we accelerate our response. We have a roadmap in the MI Healthy Climate Plan developed by EGLE and the MI Climate Action Council. That template requires more specifics on where the university plays a critical role. With convening strength, U-M will bring together communities, governments, nonprofits, businesses and other key players to reduce barriers and advance a more sustainable, just future.

## What are some of your initial goals?

I'm focused on mapping U-M's climate and sustainability work for my own understanding. I'm layering that with my background in state government and the clean energy sector to inform the white spaces in the MI Healthy Climate Plan, and identify where we can make a difference. The goal is to accelerate climate action through the research, faculty and student strength of U-M, capitalizing on practical solutions for Michigan, the Great Lakes region and the nation.

We are currently targeting the opportunities where we can have the biggest impact, and I'm so excited to dive in. It's time to capitalize on the deep expertise of universities to catalyze engagement beyond campus to make a lasting difference.

## You're a proud MSU grad, but your son is a first-year U-M student who is in the marching band. Have you started to bleed maize and blue yet?

As a member of the Spartan Marching Band, I'm excited that Max will have the opportunity to march with the Michigan Marching Band. Initially, we even thought the trumpet I used in college would get to be on the field at the Big House. Coming from a house divided, my sons grew up knowing they could feel comfortable on both campuses and that we are stronger when we focus on what unites us. Let's not forget: Maize and blue make green, and the energy transition requires that we work together across boundaries to make real, lasting change for our planet. I'm passionate about President Ono's vision that we leave the competition on the field or court and develop cooperation to solve our thorniest issues.



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# REAL-WORLD IMPACT

SEAS master's students spent last summer working on research projects near and far. Here are just a few examples of how students turned their classroom learning into real-world impact.



## Homer, Alaska

The Alaska master's project team spent three weeks in Homer conducting research at Inspiration Ridge Preserve, a 640-acre wildlife preserve managed by Nina Faust and owned by the Center for Alaskan Coastal Studies. The team conducted ecological research at the site, surveying the food availability for swallow populations and monitoring nest boxes that were used as nesting sites for the birds.



## Tobermory, Canada

The Great Lakes Marine Protected Areas master's project team is partnering with the National Oceanic and Atmospheric Administration and Parks Canada to assess the effectiveness and future of Great Lakes Marine Protected Areas, particularly in the context of 30 x 30 conservation targets, which aim to protect 30% of our waters by 2030. The project team traveled to Fathom Five National Marine Park in Tobermory, Canada, to meet with their client at Parks Canada and learn more about how the park is working to conserve its freshwater ecosystems.



## Greece

Katherine (Kate) Leeson visited Greece to conduct research for her master's project focusing on the effects of plastic waste on seabirds and their nesting island ecosystems in the Mediterranean. "Specifically, I am evaluating the levels of oxidative stress in insects, plants and birds which, theoretically, increases with more exposure to plastic waste," says Leeson. "Since the Mediterranean is the second largest plastic sink in the world due to all the rivers in Europe leading to it, it was the perfect place to conduct my research."



## Sugar Island, Michigan

The Sugar Island master's project team is working to develop co-management stewardship plans with the Sault Tribe of Chippewa Indians natural resources program, performing economic and ecological analyses to develop a story map about tribal natural resources management. The team gathered on Sugar Island in the Upper Peninsula of Michigan with representatives of the Sault Tribe and U-M to discuss and collaborate on future research and co-stewardship opportunities.



# Research Highlights

## Moss Support Carbon Storage

A study published in *Nature Geoscience* suggests that moss, those tiny plants we often see on the ground or rocks, might be an important antidote to climate change. The study, co-authored by **Peter Reich**, director of the Institute for Global Change Biology at SEAS, uncovered evidence that mosses have the potential to store a massive amount of carbon in the soil beneath them.

## Palm-oil Plantations and Deforestation

Producing palm oil has caused deforestation and biodiversity loss across Southeast Asia and Central America. Efforts to curtail the damage have largely focused on voluntary environmental certification programs that label qualifying palm-oil sources as “sustainable,” but these programs have been criticized as greenwashing tools. Study findings support some of the critics’ claims—and go much further, say SEAS study authors Professor **Josh Newell**, Assistant Professor **Benjamin Goldstein**, doctoral student **Calli VanderWilde** and postdoctoral research fellow **Dimitrios Gounaridis**.

## Reusable Take-out Food Containers Can Reduce Waste


Reusable take-out food containers can significantly reduce plastic waste, emissions and costs, according to U-M study co-authors **Christian Hitt (MS/MSE ’23)**, **Jacob Douglas (MSE ’23)** and SEAS Professor **Greg Keoleian**. They compared the lifetime environmental impacts of single-use and reusable food containers and found that the number of times a reusable takeout container gets used is a key factor impacting its sustainability performance. Depending on the single-use container being replaced, reusable alternatives—which initially use more energy to make and generate more climate-altering greenhouse gases—can break even with single-use containers after four to 13 uses.

## Groundwater Depletion in India

Farmers in India have adapted to warming temperatures by intensifying the withdrawal of groundwater used for irrigation. If the trend continues, the rate of groundwater loss could triple by 2080, further threatening India’s food and water security. Reduced water availability in India due to groundwater depletion and climate change could threaten the livelihoods of more than one-third of the country’s 1.4 billion residents, says SEAS Associate Professor **Meha Jain**, senior study author.

## Systemic Racism in Environmental Economic Research

SEAS Assistant Professor **Sam Stolper** has co-authored a forthcoming paper in the *Review of Environmental Economics and Policy* that addresses systemic racism in environmental economic research and analysis. “Our research considers various ways in which analysis in our field—environmental economics—unintentionally furthers systemic racism or obstructs racial equity,” he says. “My colleagues and I were motivated by a desire to center justice in the field of environmental economics, as well as the sense that increasing focus on the distributional impacts of policy in our field is only part of the equation.”



MICHAELA ZINT (CENTER) SPEAKS WITH PARTICIPANTS AT U-M'S CLIMATE EDUCATION SEMINAR LAST SPRING.

# Faculty Accolades



**Rosina Bierbaum**, professor and dean emerita, was elected to the American Philosophical Society. Her research focuses on the interface of science and policy—principally on issues related to climate change adaptation and mitigation at the national and international levels.



Professor **Maria Carmen Lemos** was elected to the U.S. National Academy of Sciences in recognition of her distinguished achievements in original research, which are related to climate adaptation and the role of knowledge in building adaptive capacity.



**Joan Nassauer**, a professor of landscape architecture and an international leader in landscape ecology, received the 2023 Lifetime Achievement Award from the Council of Educators in Landscape Architecture. She is the seventh individual and the second SEAS faculty member to receive the award since its inception in 2016. Dean Emeritus William J. Johnson was the recipient in 2019.



**Ivette Perfecto** has been named to the American Academy of Arts and Sciences for her contributions to biological sciences. The Bunyan Bryant Collegiate Professor of Environmental Justice, she specializes in biodiversity

and arthropod-mediated ecosystem services in rural and urban agriculture. Her expertise includes the spatial ecology of the coffee agroecosystem, small-scale sustainable agriculture, biodiversity and food sovereignty.



**Kyle Whyte** served as an advisor on the development of the environmental justice executive order signed by President Biden last April. It directs federal agencies to focus on confronting long-standing environmental injustices, furthering the administration's commitment to environmental justice. Whyte, the George Willis Pack Professor at SEAS, is a member of the White House Environmental Justice Advisory Council and a U.S. Science Envoy.

**Michaela Zint**, associate dean for academic affairs, in partnership with associate deans from all 19 U-M schools and colleges, led an effort to present recommendations to the Office of the Provost that were an outgrowth of a climate education seminar held last spring. Its objective was to recommend ways for students on the Ann Arbor campus to gain knowledge and skills to turn climate literacy into action. As a result of the seminar, U-M faculty participated in professional development to help them learn how to incorporate climate education into their respective courses, and a new certificate program in carbon management is being explored. Zint also is teaching a seminar on how to turn climate anxiety into action that will aid the development of climate leaders at SEAS and beyond.

# Class Notes



Lenski



Scheuer

## 1970s

**Sadik Artunç (MLA '79)**, FASLA, FCELA, received the American Society of Landscape Architects (ASLA) honor award. He has been the head of the Department of Landscape Architecture at Mississippi State University since January 2007. Prior to that, he taught in the Robert S. Reich School of Landscape Architecture at Louisiana State University. Artunç's teaching involves design implementation and construction, site planning and design, and regional planning and design. His professional consulting involves large-scale planning and design with a focus on recreation and tourism, resource planning, and design implementation and construction. Artunç was inducted into the ASLA Council of Fellows in 2000 and the Council of Educators in Landscape Architecture's Academy of Fellows in 2023.

## 1990s

**Rebecca Watts Hull (MS '95)** spent more than three years as a service learning and partnerships specialist with the Center for Serve-Learn-Sustain at the Georgia Institute

of Technology (Georgia Tech). In January 2023, she moved into a newly created role in Georgia Tech's Center for Teaching and Learning that is aligned with the institute's strategic-plan goal of transformative learning that equips students to advance the United Nations Sustainable Development Goals (SDGs). As assistant director of faculty development for sustainability education initiatives, she collaborates with sustainability leaders and faculty development professionals to support faculty in redesigning courses across a range of disciplines to incorporate sustainability and the SDGs. In collaboration with the Association for the Advancement of Sustainability in Higher Education staff, she also leads a monthly meet-up group of professionals in similar roles at other institutions.

## 2000s

**Chingwen Cheng (MLA '01)** became the director of the Stuckeman School in the Penn State College of Arts and Architecture on July 1. She previously was the program head and associate professor of landscape architecture, urban design and environmental design at the Design School at Arizona State University.

Chen also serves as the 2023-2024 president of the Council of Educators in Landscape Architecture.

**Jennifer Dowdell (MLA '07)** is a senior technical advisor on landscape ecological planning and design at Biohabitats, a national interdisciplinary design and consulting firm. Biohabitats was this year's recipient of the prestigious Landscape Architecture Firm Award from the American Society of Landscape Architects (ASLA), which is the highest honor that ASLA may bestow on a firm. "The skills I gained during my time in SEAS' MLA program, led by a cohort of incredible professors including my advisor and mentor, Joan Nassauer, continue to inform my contributions to Biohabitats' body of design and planning work," Dowdell says. "I find ongoing inspiration in SEAS' contributions to the global potential for innovative regenerative design approaches and climate change responsiveness."

**Monique Oxender (MS/MBA '04)** was named interim chief corporate affairs officer at Keurig Dr Pepper (KDP). In this role, Oxender oversees the company's corporate responsibility, government affairs, corporate communications and internal communications work.





Coleman



Artunç



Newson



Watts Hull

Oxender has been with KDP for more than 11 years, most recently as senior vice president and chief sustainability officer, where she designed the organizational and strategic framework for the company’s corporate responsibility platform. Prior to joining KDP, Oxender served in leadership roles at Ford Motor Company, overseeing supply chain sustainability programs and working with a wide range of external stakeholders.

**Kif Scheuer (MSc ’02, PhD ’07)** is the national service director at Farallon Strategies. He writes: “Over the last year, I’ve had the chance to work on a great project in and for Michigan. Our team is helping the Michigan Department of Environment, Great Lakes and Energy’s Office of Climate and Energy with the design and launch of a MI Healthy Climate Corps. Starting in early 2024, the MI Healthy Climate Corps will field a cohort of 30 AmeriCorps members who will provide critical support to communities tackling climate change. MI Healthy Climate Corps members will receive training and career development support to step into Michigan’s climate leadership pool. Our team is supporting the Office of Climate and Energy with program design and early-stage

partner development. It’s been great to be back in Michigan (albeit virtually) and reconnecting with people I knew back in my School of Natural Resources and Environment days (I can’t quite say SEAS yet!).”

## 2010s

**Kimberley Irby (MS ’18)** moved to Washington, D.C., in July 2023. She is now a senior climate resilience specialist for ICF in its Arlington office, where she supports climate change vulnerability analyses and climate resiliency planning for government, transportation, utility and other clients.

**Shoshannah Lenski (MS ’11)** is the new associate director of the Center for Sustainable Systems at SEAS. She previously worked at DTE Energy for 12 years, which included advising the CEO about clean energy strategy. She also served on the Ann Arbor Energy Commission for seven years.

**Juliana Pino (MS/MPP ’15)** contributed recommendations to the 2023 mayoral transition report for Chicago Mayor Brandon Johnson and his incoming administration. Pino is the policy director at the Little Village Environmental Justice Organization.

## 2020s

**Marney Coleman (MS/MBA ’23)** was hired as the sustainability manager at Trammell Crow Company (TCC), a global commercial real estate company. She works with TCC’s director of sustainability to develop the firm’s sustainability strategies, with a focus on the decarbonization of TCC’s portfolio of industrial, office and multifamily projects.

**Jannice Newson (MS ’20)** is the co-founder of Lillian Augusta, a company that is developing a plant-based, 100% biodegradable braided hair product for Black women. Lillian Augusta recently was selected as the third-place winner in the National Black Business Pitch, of which 1,700 applicants were whittled down to the top three that competed in a live virtual pitch. Learn more about the company and how you can support its launch at [hairwithoutharm.com](http://hairwithoutharm.com).

### Share Your News!

Did you get a new job or a promotion? Were you recognized with an award? Share your news with us. Email [seas-communications@umich.edu](mailto:seas-communications@umich.edu) or complete the form at [seas.umich.edu/alumni/class-notes](http://seas.umich.edu/alumni/class-notes).



(MS '22)

# Frances Arthur

Story by  
Nayiri Mullinix

**W**e all use energy in our daily lives, but how often do we stop to think about what it takes for that energy to be produced and then transmitted to us? Frances Arthur (MS '22), an analyst at Daymark Energy Advisors, is doing the thinking for you. Before she had even graduated from SEAS, Arthur's background in sustainability and analysis of technological advancements in renewable energy was enough for her to secure the position.

Working with a wide range of clients, including energy developers, utility companies, commissioners and environmental organizations interested in constructing renewable energy in the right way, much of Arthur's work is performing analyses on the wholesale and retail markets for electricity and helping clients understand the options, costs and potential outcomes of changing energy sources.

At the core of Arthur's work is advocating for the communities or organizations that she's representing. She says that energy-burdened neighborhoods are typically low-income and/or Black, Brown and Indigenous communities. Another example of an energy-burdened community is one that simply does not have reliable energy. Such was the case in a New England town that was suffering from frequent rolling blackouts and extreme weather event-related outages. "Part of what I do is help find solutions," says Arthur. "How can we improve this town's energy access? On my end, I provide an analysis of the costs, benefits, and regulatory and legislative analyses associated with what needs to be done and what the community can do to get it done."

Daymark is a small company of 36 people, but Arthur says the wide range of disciplinary backgrounds and the close team collaboration is comforting for her,

and closely reflects the experience she had at SEAS. "Daymark really values education and knowledge, and my colleagues are always willing to help. It's truly a team environment, and I love it here," says Arthur. "Thinking back to my time at SEAS, I had a variety of friends that pulled me in different directions and made me become more myself. It was a place where I grew so comfortable and could speak my opinions freely. I feel this same level of comfort at Daymark."

“

Working on resilience  
and reliability is exactly  
why I went to SEAS.”

Arthur has put her work at Daymark on pause this fall to work as a Department of Energy Clean Energy Innovator Fellow. The one- to two-year fellowship will allow her to work on regulatory cases that involve energy, environmental justice and resiliency, and distributed energy resources planning. "I got an email encouraging alumni to apply for the fellowship, and after chatting with another SEAS alum who participated in a similar fellowship, I knew it was something I had to do," says Arthur. "Working on resilience and reliability is exactly why I went to SEAS, and I'm so lucky that the opportunity just fell into my lap." ♡



ELLIOTT KURTZ WITH HIS SON, SIMON, ON A BIRDING TRIP AT PATUXENT RESEARCH REFUGE. PHOTO CREDIT: ALLAN RODRIGUEZ

Story by  
Denise Spranger

(MS '17)

# Elliott Kurtz

**E**lliott Kurtz (MS '17), a senior geospatial analyst at Chesapeake Conservancy, gives credit to his father for helping him discover his career path.

“My dad convinced me to take a Geographic Information Systems class in my sophomore year of college,” says Kurtz. “I’d always liked working with computers and it opened a new way of seeing and understanding the natural world. I realized that data analytics would give me a way to contribute to solving environmental problems.”

“

I’m excited to pass on the lessons I’ve learned about our responsibility for the world to another generation.”

After earning his undergraduate degree in marine science from Stony Brook University, Kurtz chose to pursue the Geospatial Data Sciences specialization at SEAS.

“I was drawn to SEAS by the promise of an education that highly integrated technical training with application in environmental science and ecology,” says Kurtz. “What I did not expect going in was how much grad school would change how I understood the human dimension

of the natural world. I learned to be more critical of common narratives and assumptions that I and others carry.”

Kurtz carries that perspective into his role at Chesapeake Conservancy, a nonprofit organization in Baltimore. His job is to find technical solutions to help the conservancy’s partners make decisions and implement strategies to improve the Chesapeake Bay watershed for people and wildlife. Toward that aim, he builds geoprocessing workflows to create new datasets—such as high-resolution land-use/land-cover products—and transforms data into insights about the bay watershed. He also builds and maintains web applications that allow public access to the organization’s datasets.

Beyond his role as a geospatial analyst, Kurtz enjoys an eclectic range of interests. In addition to hiking, birding and cooking, he plays the clarinet—sometimes with a Klezmer band in Baltimore for synagogue events, along with the occasional wedding. He’s also started learning embroidery.

“But I spend most of my non-work time with Simon, my 2-year-old son,” says Kurtz. “We like to explore outside together, and sometimes he’s strapped to my back for an early-morning birding trip at our neighborhood park. I’m excited to pass on my family’s love of nature and the lessons I’ve learned about our responsibility for the world to another generation.” ■

# Carly Edwards

(BS'04)

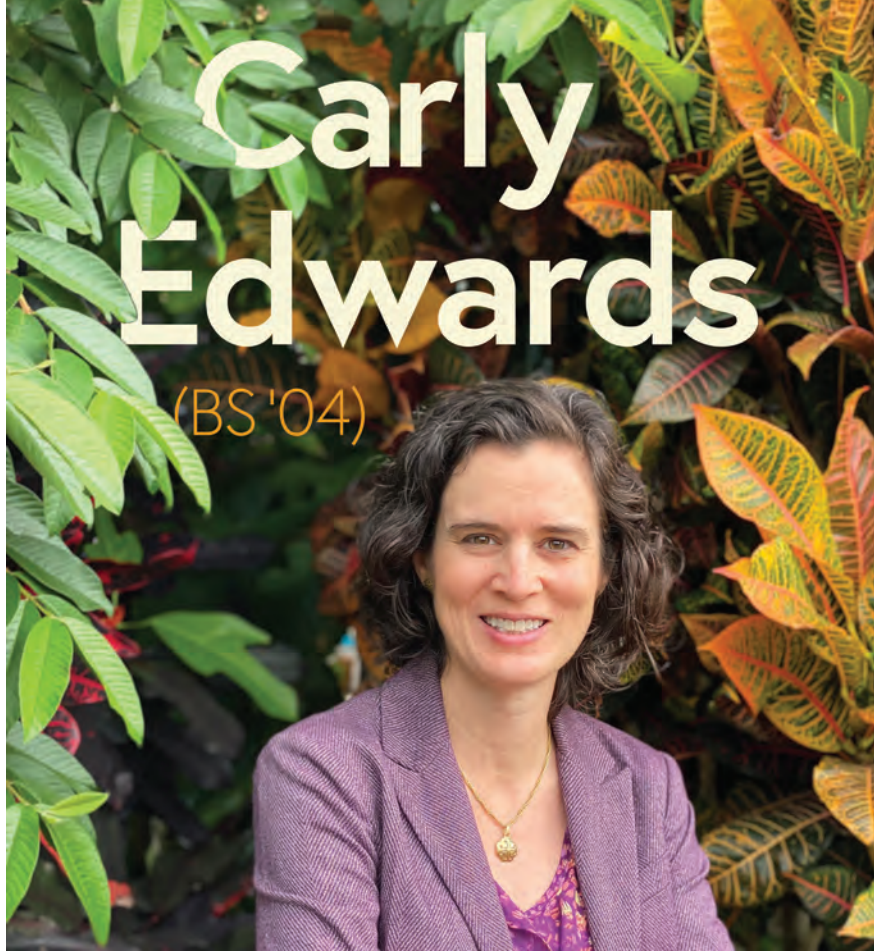


PHOTO CREDIT: VANESSA BOADI

## Story by

Denise Spranger

**W**hen facing global challenges, Carly Edwards (BS '04) believes in working—from the ground up. And that's just what she's doing as the CEO of Ground Up Ghana, a food manufacturing social enterprise that develops plant-based food ingredients from underutilized, climate-friendly crops grown by rural women farmers in northern Ghana.

The SEAS alumna—who founded Ground Up Ghana in 2020—made the country her full-time home in 2010. Edwards relates how she came to embrace the West African nation.

“My grandmother grew up in Cameroon, and my great-grandfather—a 1923 graduate of U-M’s medical school—was a doctor there for over 35 years,” says Edwards. “My grandmother’s stories of life in Cameroon interested me from an early age, and inspired my love for African literature.”

In high school, Edwards seized the opportunity to become an exchange student in West Africa through AFS Intercultural Programs. Though Cameroon was not an option, she was placed with a host family in Ghana, and has remained close to the family for 23 years. Her host brother supports her work with Ground Up Ghana, and takes the lead on maintenance projects.

“I had an amazing time in Ghana with my host family and kept finding ways to come back,” says Edwards. Her return trips included studying abroad for a semester at the University of Ghana, and later conducting research in-country with Peace Corps volunteers.

Over the course of 15 years, Edwards has held numerous roles in Ghana, and central to them all are issues concerning climate resilience, public health, agriculture, food production and education.

“When I was working on public health programming in a cocoa-growing village, I often went to farm with the community on Saturdays,” Edwards recalls. “I was inspired by the women farmers who were cultivating crops like plantains, tomatoes and peppers, in addition to their cocoa trees. Yet I realized that their skill and dedication to farming were overlooked by training and extension services, which are still geared towards men.”

These combined insights and experiences inspired the founding of Ground Up Ghana. Its goals include converting farmland from resource-heavy production to crops that are traditionally grown with agroecological methods; improving the livelihoods of women farmers through a reliable market and fair price for their harvests; providing employment and on-the-job training in a supportive/collaborative work culture for young Ghanaian women; and creating healthy meal options for conscious consumers worldwide.

Edwards envisions the potential outcome of these goals in a global context.

“Women farmers and climate-resilient crops like Bambara beans and millet—that improve soil health and provide better nutrition than corn—give me hope that we have natural and traditional solutions to climate change that can be harnessed alongside new ‘tech’ solutions for broader, more inclusive reach and impact.” ♣

# Cynthia Shih/ (MS/MBA '13) Vienna Teng

Story by  
Lori Atherton

**S**inger-songwriter Cynthia Shih (MS/MBA '13) travels the world playing her soulful indie pop music to audiences large and small. Performing under the stage name Vienna Teng, Shih draws inspiration for her songs from the world around her, including climate issues.

These days, Shih's fans not only can see her perform live at their favorite club, but they can also participate in climate action workshops facilitated by her. It's a way to connect Shih's love of music with her background in environmental sustainability—something she has long aspired to do.

"I had always hoped there was a way to bring my music career and my sustainability career together," says Shih, who worked at global consulting firm McKinsey & Company for nine years with a focus on decarbonization and the circular economy.

"I've built a fan base that has been really loyal over the years, and I wanted to work with them to do something very tangible and concrete about climate change."

Using the skills she gained on the job and in the Behavior, Education and Communication specialization at SEAS, Shih gathers with fans at intimate music venues to help them create personalized climate action plans.

Shih describes it as an opportunity for participants to "discover what enjoyable, meaningful climate action looks like"—from identifying what motivates them to act and the barriers that prevent them from doing so, to practical next steps they can take to make a difference.

Shih, who began playing classical piano at age 5, will even perform a song or two for inspiration.

"I'm bringing back a lot of what I studied at SEAS," says Shih. "I think of it as me learning how to be a community organizer."

The climate action workshops are open to the public and advertised as part of Shih's tour. More-committed

fans can join Shih's online community on Patreon, a subscription-based service, where they can get access to exclusive content, such as new songs, behind-the-music extras, and climate action check-ins and learning sessions.

Before enrolling at SEAS, Shih had been a software engineer at Cisco Systems who moonlighted at open-mic nights at coffee shops and other venues. Her big break came when Michael Tarlowe (BBA '94), another U-M graduate whom she had never met, reached out to ask if he could represent her. Tarlowe had recently left his finance job to start an independent record label.

Neither had any music business experience, Shih says, but they "took a huge mutual risk on each other."

It was a gamble that has paid off in spades. Since 2002, Shih has released six albums, made an appearance on CBS's "Late Show with David Letterman," and opened for Joan Baez, India Arie, and Brandi Carlile, among others. Her songs "Harbor" and "Level Up" were even featured in U-M's welcome-back videos for the past two years, which Shih says is meaningful.

"I would love for my music to be the soundtrack for changemakers in the world," Shih says. ♣

PHOTO CREDIT:  
KAREN SHIH



# Jennifer Fuller

(MS '21) **Story by**  
Denise Spranger



As the project coordinator at the National Audubon Society, Jennifer Fuller (MS '21) recalls that her childhood dream of becoming a wildlife biologist was kindled by a love of nature. As a graduate student, she discovered how that dream would take flight.

“My interest and appreciation for birds started while doing undergraduate fieldwork in Arizona, New Zealand, Florida and Ohio,” says Fuller. “But it wasn’t until I was at SEAS that I found my niche in avian research.”

Fuller, who specialized in Ecosystem Science and Management, worked primarily within SEAS Assistant Professor Karen Alofs’ lab, which studies freshwater conservation ecology. Her master’s thesis focused on the breeding response of the black tern—a wetland-breeding shorebird in rapid decline—to lake-level extremes and habitat loss in Michigan’s Lake St. Clair.

“I was lucky enough to work with Audubon studying black tern breeding colonies in the Great Lakes,” says Fuller. “The combination of getting to band and monitor birds in the field and apply geographic information systems to model the dynamic relationship between nest success and lake levels was perfect for my interests.”

In her current position at the National Audubon Society, Fuller serves two teams. For the national team, Fuller’s main goal is to help coordinate a large-scale stewardship project on the Gulf Coast that contributes to the protection of coastal breeding birds. She also assists with geospatial work for the Climate Initiative.

On the Great Lakes team, Fuller’s work is varied. “I do anything from making mapping tools and running

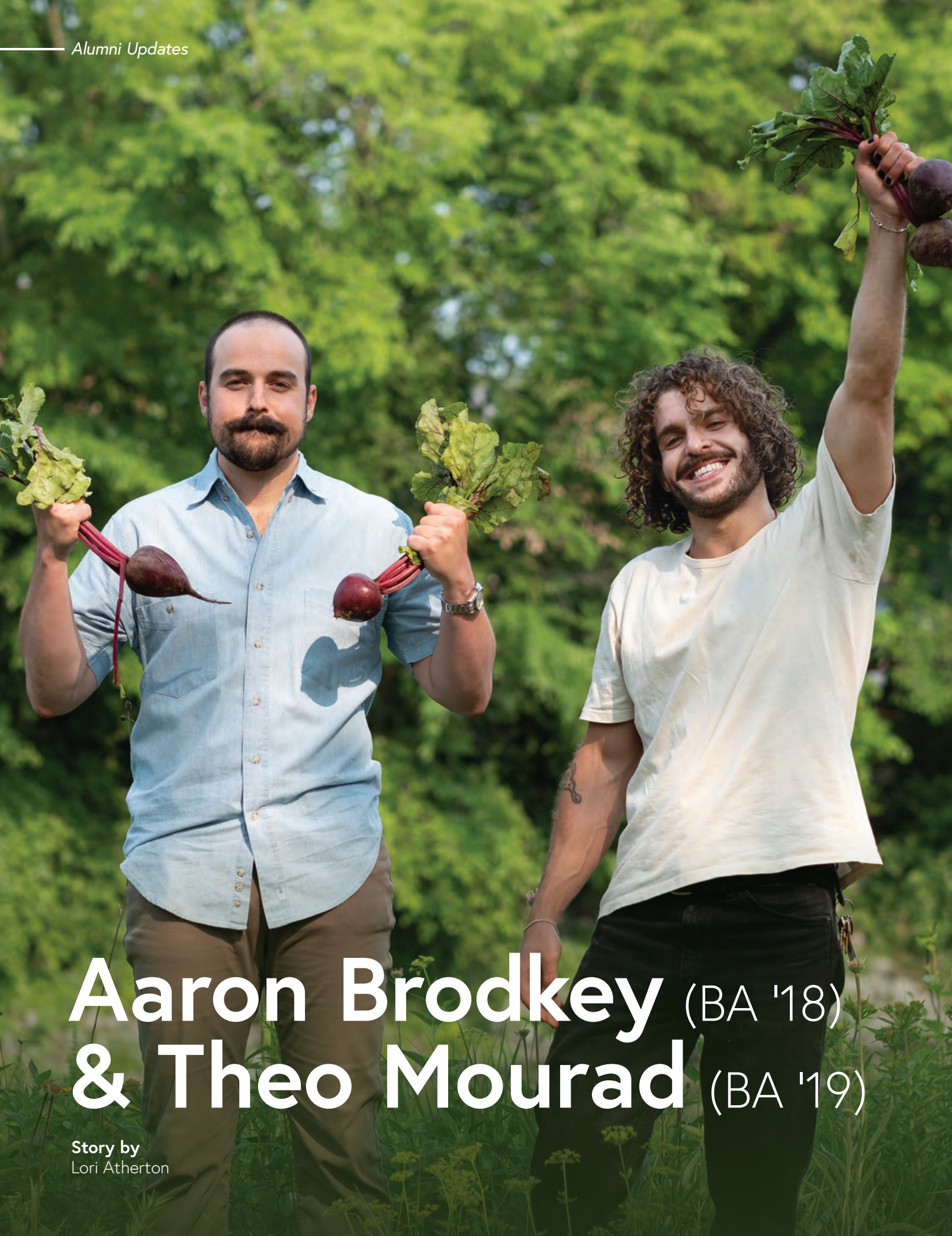
analyses with eBird data, to surveying marsh birds in the field,” relates Fuller. “By far the most exciting project I’ve worked on was putting nano-tags on juvenile black terns and tracking their migration. But working in the field is always inspiring, and so are the people I work with. I find myself constantly learning from them.”

Before taking the position at Audubon in early 2022, Fuller interned for the Highstead Foundation, a regional conservation nonprofit in Connecticut. The StoryMap she created served as the landing page for the organization’s annual meeting of conservationists throughout the Northeast.

“Highstead was a great introduction to nonprofit work and using ArcGIS Online,” says Fuller. “It was more than just a technical learning experience—I feel fortunate to have learned from so many perspectives on conservation and land justice.”

In addition to her avian research, Fuller also is an accomplished artist and photographer.

“I’ve always loved making art, and it’s reflected my passion for the outdoors and wildlife. I get a lot of my inspiration from observing and photographing wildlife in these amazing natural areas. Creating art also helps me to connect with nature in a more personal way.” 🍃



# Aaron Brodkey (BA '18) & Theo Mourad (BA '19)

Story by  
Lori Atherton



**Y**ou've heard of beef jerky. But what about *beet* jerky? If U-M graduates and longtime friends Aaron Brodkey (BA '18) and Theo Mourad (BA '19) have their say, their vegan jerky will become everyone's go-to healthy snack. Their product is sold under their brand, THEO's Plant Based, which was founded in Chicago in 2021.

Mourad came up with the idea for beet jerky during the COVID-19 lockdown after working as a chef in training at Blue Hill at Stone Barns, a high-end farm-to-table restaurant in upstate New York. Inspired by that experience, as well as his years working on farms and in other restaurants, Mourad used his downtime to experiment with a beet jerky recipe.

Mourad chose beets because of their health benefits, flavor and rich color. "Beets are a really underappreciated vegetable," he says. "They are one of the healthiest foods there are, but people aren't eating them. Our beet jerky makes it a little bit easier for people to be healthy."

“

We're really trying to incorporate social and environmental considerations into what we do.”

What began as a hobby turned into a serious business after Mourad shared product samples with Ann Arborite Tim Redmond (BA '70), the owner of Skinny Farm of Scio and a pioneer of the natural foods industry. Mourad had worked for Redmond for two summers while he was at U-M.

"I didn't know at the time that I was pitching the concept to Tim, but that's what I ended up doing," says Mourad, who graduated with a degree in psychology, social action and community change. "I was just excited to share my beet jerky, but Tim saw potential in it."



(AT LEFT) AARON BRODKEY (IN BLUE) AND THEO MOURAD WITH THEIR BEET JERKY PRODUCT (ABOVE). PHOTO CREDITS: BRUNO POSTIGO

Brodkey also saw similar potential. He began advising Mourad on the side, offering business advice he gained from his job at a venture capital firm that supports plant- and cell-based food companies. Brodkey—a graduate of the Program in the Environment, a joint program between SEAS and the College of Literature, Science and the Arts—came on board full time as the company's co-founder in January 2022.

"We're really trying to incorporate social and environmental considerations into what we do," says Brodkey, who notes that THEO's uses compostable packaging and regenerative organic practices. The beets aren't peeled, for instance, which means that 96% of the raw beet ("even the ugly parts") is used in their jerky, while the leaves are used as compost by the organic farms that source the beets.

The product is sold online at Whole Foods Markets in the Midwest, including both Ann Arbor stores; at all Argus Farm Stop locations in Ann Arbor; and in dozens of natural food stores around the country.

"What's most important to us is to make products that are truly good for the earth," says Brodkey. "We want to build a regenerative organic vegetable brand where we can have different plays on vegetable products that are at the intersection of flavor, nutrition and sustainability." ♡

The University of Michigan is planning for the future of the Ann Arbor campus, with plans to reimagine the physical environment in ways that manifest the university's strategic vision. Campus Plan 2050 has six focus areas, one of which is Landscape + Open Space. Tao Zhang (MS/MLA '08), a partner and landscape architect at Sasaki Associates, is leading the effort for this focus area to incorporate enhancements and improvements that will simultaneously advance the university's sustainability and DEI goals.

Zhang and his team at Sasaki, a world-renowned design firm known for its deep expertise and integrated global practice across planning and urban design, landscape architecture, civil engineering, ecology, and architecture, particularly in higher education, are committed to listening and translating the university's needs and aspirations into a coordinated and inclusive plan that brings together its 19 schools and colleges, campus departments and entire campus community.

"We will craft a blueprint for everyone on campus to come together around a unified vision and common goals for academics, research, innovation, living, learning and working in Ann Arbor," says Zhang. "Part of the iterative planning process is looking at all parts of campus to optimize their connections and synergies through multifaceted lenses, including social, ecological, mobility and inclusion considerations."

Recognized as an international leader in ecological design, Zhang brings impactful expertise to the Landscape + Open Space focus area. "In the planning process, we not only investigate the campus as a

physical environment for the U-M community but also consider how it fits into Ann Arbor and the larger Huron River watershed. This includes considering how the campus landscape can contribute to the university's mission and the city's goals for achieving carbon neutrality and nature-based stormwater management strategies," says Zhang. "Since these overarching goals apply to all six focus areas in campus planning, we're working in close collaboration at Sasaki."

One of the major goals for all focus-area teams is to incorporate flexibility in the plans so that the campus is well-positioned for any unplanned changes such as pandemics or the rapid development of artificial intelligence. "We are currently developing provocative planning scenarios for how the campus can evolve based on strategic prioritization," says Zhang. "We are working through the complex web of possible directions and negotiating among a wide array of opportunities and constraints for the most promising, yet flexible plan possible."

With a wide range of award-winning projects under his belt—including a national panda reserve in China and various campuses around the world—and a deep understanding of his alma mater, Zhang's experience and perspective are both valuable and unique for U-M's planning process.

"My years at SEAS were intellectually formative for me and have inspired the direction of my career in countless ways. It is such an honor to have the opportunity to work closely on the future of this campus that I hold so close to my heart." ■



Tao  
Zhang

(MS/MLA '08)

Story by  
Nayiri Mullinix

**G**rowing up, Elizabeth Wallace (MS/MBA '22) watched as her mom ran an environmental education nonprofit in her free time. Her mom's passion made it clear to Wallace that this work was important, but since it was on a volunteer basis, what was less clear was that working in nonprofits could be her career path. It wasn't until her senior year in high school and a defining trip to Chile that her view shifted after a powerful earthquake struck. The town Wallace lived in was hit hard, and she says the experience of meeting people from various nonprofits working around the clock in the emergency opened her eyes to the fact that this was the type of work she wanted to do.

"I realized there was no shortage of talent, passion and vision in the nonprofit sector, but sometimes there was a gap in financial resources and operational processes that could bring long-term stability," says Wallace. "It was inspiring, and as a quantitative and process-oriented person, I realized I could build skills to support nonprofits operationally to set their teams up for success so that they could better serve more people through their mission."

She went on to study business and Spanish as an undergraduate student at U-M with the intention of working in the private sector to build these strategic and operational skills, then return to grad school and transition to the nonprofit sector. When Wallace started studying at SEAS she knew she wanted to work on issues that impacted people's day-to-day lives in her community in Detroit, and she found a way to focus on energy equity.

"Through my coursework, research and hands-on projects with Detroit-based organizations, I saw there was an intersection where I could work on energy and building decarbonization, and still be focused on equity and environmental justice work," says Wallace.

Since graduating last year, this is exactly what she has done in her role with Elevate, a nonprofit focused on climate and energy equity. Wallace, who is associate director of community programs in Michigan, leads a team that has doubled in size in a year. The team's priority is to partner with municipalities and community-based organizations on projects related to utility affordability, building decarbonization, climate planning and renewable energy access.

"I feel strongly that everyone should have access to clean and affordable power, heat and water, and the opportunity to be a part of combating climate change—this shouldn't be a luxury available only to those with significant financial resources," says Wallace. "This work fills my heart both intellectually and emotionally, and coming to SEAS was the catalyst to find this career path. My professors, peers and experiences made it clear that I was in the right place to explore many possibilities, and then get focused on what is really important to me." ♣

# Elizabeth Wallace



(MS/MBA '22) Story by  
Nayiri Mullinix



# Hayley Currier

(MS '18) **Story by**  
Lori Atherton

those issues,” says Currier, who specialized in Environmental Policy and Planning at SEAS. “Are they thinking about sea-level rise? Are they thinking about how extreme heat and flooding are connected? As an advocate, I get to be innovative and help these communities think outside the box to develop solutions.”

Currier works to ensure that those solutions are not only good for the environment, but also good for people—especially communities that have traditionally been left out of the conversation.

“A lot of environmental justice groups and frontline communities have been raising the alarms about environmental issues for years, but they’re often not prioritized or listened to as much,” says Currier. “It’s important to think about how we’re sharing power and that my ideas are not the best ideas. And that the people who have the best ideas are the ones with lived experience. So, how do I balance the positionality and the power that I have with the solutions that are actually going to help people who are impacted the most?”

Before joining Save the Bay, Currier worked on land use planning policy and advocacy related to transportation, housing, open space and agriculture at Greenbelt Alliance and TransForm.

She stresses that anyone can get involved in environmental advocacy; all it takes is a willingness to act. “Pick an issue that’s important to you and get politically involved, especially at the local level where representatives are so accessible,” says Currier. “It’s their job to listen to us, and I don’t think we use our power enough. But sticking with the issue, becoming informed, building a relationship with your city council member and then getting involved during elections is really impactful.” ♡

**H**ayley Currier (MS '18) says it’s meaningful working on big-picture environmental issues, even if the results aren’t immediately noticeable.

“It’s not as if you change a policy and your community looks different tomorrow,” Currier says. “But you do see how the conversation changes and how the budget line changes, so I’m happy being part of something that is moving the needle in the right direction.”

Currier is a policy manager at Save the Bay, a nonprofit organization whose mission is to protect and restore the San Francisco Bay through political advocacy, habitat restoration and education.

With a focus on equitable climate resilience, Currier helps cities and communities in the Bay Area adapt to climate change impacts by ensuring that green infrastructure is part of the built environment.

Much of Currier’s job involves collaborating with city staff, elected officials and community partners to develop nature-based resiliency solutions that address sea-level rise, storm flooding and pollution runoff—which are major issues facing the Bay Area as a result of climate change.

“I look for opportunities to identify problems in municipalities and partner with them to address

Story by  
Nayiri Mullinix

(MS/MBA '12)

# Eshanthi Ranasinghe

**F**or several years, Eshanthi Ranasinghe (MS/MBA '12) worked at Omidyar Network, a firm that made philanthropic investments that contributed to more inclusive and equitable societies. This experience awakened in her a realization that the unique blend of business know-how and systems thinking that she gained at SEAS could be used for meaningful social change. Two years ago, when she got a call from The Audacious Project, a nonprofit housed at TED, about its collaborative funding initiative aimed at catalyzing social impact for projects that are unusual and innovative, she saw it as an opportunity to use her skill set to make an even bigger impact.

“I already was thinking about systems change from the perspective of impact, not just profit. In this role, it’s such a joy to be able to really think about what a project is aiming to do, appreciate the complexity of it, take the risk and watch it evolve. That’s what I love most about funding—it’s a useful role,” says Ranasinghe, managing director of discovery and insight at The Audacious Project. “The whole effort is about ideas. We want to break the cycle that has limited the reach of risk-averse donors by funding projects that are challenging the status quo of the system they are in while meeting a need.”

One recent award was given to Think of Us, a nonprofit research and design lab that aims to improve the foster care system in the U.S. Thanks to The Audacious Project, the organization received a five-year, \$47.5 million commitment to help transform the child welfare system in a way that invests in child and family well-being.

“We look for projects that make you sit back and go, wow, something is changing. The founder and CEO of Think of Us lived in the foster care system and was inspired to change it. To him, this is about shifting systems and disrupting the cycles to reduce harm,” says Ranasinghe. “It’s incredibly inspiring to our team to boost the work of such organizations and support their ideas.”



Ranasinghe, who was a dual-degree student who specialized in sustainable systems at SEAS and business at the Erb Institute at the Ross School of Business, says that being introduced to systems change pushed her to look carefully at the complexity of the world and environment we’re in.

“At SEAS, I could be unapologetically impact-oriented and put something above myself or the economy and look at what’s really important—what matters to people and the planet—and make that a guiding star,” says Ranasinghe. “There’s something magical about being able to learn through different lenses, and I really appreciated that about my experience at SEAS. During the course of my career, I’ve seen clearly how systems thinking ties into my work, and I’m using it every day. Sometimes I wish I could go back and take the same classes again but with renewed intention.”



JOANN VALENTI (MIDDLE)

# In Memoriam

## Michael Fraker

Michael Fraker (PhD '07), of Ann Arbor, died on April 23. He was 44. A well-respected researcher, Fraker was a research program manager at Michigan Sea Grant (MISG) and an assistant research scientist at SEAS. His expertise in ecological modeling contributed to improved insight and management of Great Lakes fisheries. He joined MISG in 2021, where he led projects on critical Great Lakes issues, such as sustainable fisheries, healthy coastal ecosystems and climate change adaptation. Prior to joining MISG, Fraker served as an assistant research scientist at the Cooperative Institute for Great Lakes Research, where he studied various issues in aquatic ecology, including harmful algal blooms, fisheries and ecosystem responses to multiple stressors. He previously held postdoctoral research positions at U-M, Oklahoma State University and The Ohio State University. Fraker earned his PhD in ecology and environmental biology at U-M in 2007. The Michael Fraker Student Research Memorial Fund has been established in his honor and will be used to support Michigan Sea Grant student activities. To donate, contact the SEAS Development and Alumni Relations office at [seas-alumni@umich.edu](mailto:seas-alumni@umich.edu).



Arthur F. Thurnau Professorship for excellence in teaching in 2004. In addition to the PitE directorship, he served as the director of U-M's Camp Davis (Geology Field Camp) in the mountains of Jackson Hole, Wyoming, from 1990 to 1999. He also was the associate dean for undergraduate education in the College of Literature, Science and the Arts from 1998 to 2004.

## JoAnn Valenti

JoAnn Myer Valenti (PhD '83), 78, of Tampa, Florida, died on July 23. A renowned expert in environmental communications, she earned bachelor's and master's degrees in communications and journalism from the University of Florida and a PhD in environmental communication from SEAS. Valenti served on the faculties at U-M, the University of Tampa, the University of Florida and Brigham Young University. Once retired, she taught classes at Westminster University in Utah. Her research on environmental risk, media ethics, communicating sustainability and women in communications appeared in peer-reviewed and special interest media. Her publication, "Environmental Reporters in the 21st Century" (2010), reflects much of her research about environmental communications. She was an elected fellow and officer of the American Association for the Advancement of Science, served on the boards of Science Communication and Applied Environmental Education and Communication, co-founded the National Tropical Garden Environmental Journalism Program in Hawaii, and was a founding academic member of The Society of Environmental Journalism, where she served as chair of the Rachel Carson Book Award jury.

## Robert M. Owen

Robert M. (Bob) Owen, director of the Program in the Environment from 2005 to 2010, died on June 10 at age 77 in Ann Arbor. He earned a PhD in oceanography and limnology from the University of Wisconsin-Madison in 1975, then began a 37-year career at U-M, first as an assistant professor and later as a professor of marine geochemistry with tenure. He received the prestigious



## Last Look

Austin Crane (MS '22), research laboratory specialist with SEAS Professor Allen Burton's Ecotoxicology Lab, loads test organisms into the *in-situ* Toxicity Identification Evaluation (iTIE) system during a technology test run at Saginaw Forest in Ann Arbor. Crane and the Burton Lab are working to develop the iTIE system as a tool that can be used to detect and quantify contamination in aquatic ecosystems. The iTIE system pumps water from a potentially contaminated site, cleans specific toxic compounds from the water and exposes the water to test organisms like *Hyaella azteca*, a shrimp-like crustacean commonly used in toxicity tests. As predicted, the test organisms at Saginaw Forest had high rates of survival, indicating a relatively clean aquatic environment.

PHOTOS BY MADDIE FOX





INCOMING STUDENTS POSE WITH SEAS FACULTY AND STAFF DURING ORIENTATION AT THE U-M BIOLOGICAL STATION.

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## MISSION

At SEAS, we are at the forefront of building a more sustainable and just world for all by transforming the impact of higher education and reimagining the future. We are advancing action through innovation, research, education and engagement in society, and developing leaders who are empowered to halt the climate crisis and create an environmentally sound future for generations to come.

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