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Nelson Institute for Environmental Studies
UNIVERSITY OF WISCONSIN–MADISON

THE COMMONS

For alumni and friends of the Nelson Institute for Environmental Studies at the University of Wisconsin–Madison






ALUMNI AWARD WINNERS 2022

Meet the 2022 Alumni Award Winners

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We'd love to hear from you! Send us feedback or questions about this issue, or share story ideas for future issues.

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From The Dean

Water on the Brain

When I first landed in Madison on a plane ride from the dry plains of Colorado almost 40 years ago, the first thing I saw out the window were the lakes. Gazing in genuine awe at these countless crystal pools spanning to the horizon I thought to myself: "Do they just leave all this water lying around?"

I remain awed by the region's magnificent hydrology and we here at the Nelson Institute think a lot about water. Will we see more of it with climate change? How do we keep it where we want it? How do we keep waste out of it? Can we unlock its power through innovation? How can we protect it as habitat for species of conservation and cultural significance? In that regard, the current issue of The Commons shows the Institute at its best. This issue highlights a huge range of Nelson student, affiliate, and faculty activities, but water definitely jumps out.

Consider the risks of climate change on the Mississippi river tourism, agriculture, and biodiversity. As precipitation, snowmelt, storm intensity, and land uses change and become chaotically more variable, the river rises, falls, and floods in ways that affect both its structure and its function. Here is where the Nelson Institute's Wisconsin Initiative on Climate Change Impacts (WICCI) is making critical contributions; by tracking modeling, and forecasting these changes, WICCI works with communities to plan for new ways to live with the "Great River" or Misi-ziibiin in the Anishinaabemowin (Ojibwe) language.

Professor Becky Larson has joined the Institute this fall, bringing her incredibly innovative research on turning waste into energy, and so, improving water quality. Implemented right, and at scale, this approach can keep streams and lakes free of phosphorus and other nutrients, drive away algal blooms and make toxic waterways a thing of the past.

Nelson undergraduate Zebulon Grove is pursuing a career in sustainable business practice but his revelatory environmental experience happened (you guessed it) on the water. With weeks of kayaking under his paddles in Alaska, you'll learn about how Grove is now seeking to make the complex supply chains that fuel our industries and lives both clean and green.

Beyond this, we highlight the inspirational, globe-spanning work of our new alumni award winners here, as well as that of our new and continuing endowed professors, chairs, and fellows. And you'll hear about our many scholarships and fellowships, including the Graduate Scholarship for Excellence in Water Resources Management (named for our fabulous grad student coordinator Jim Miller!). But as the new school year begins, and in the spirit of Madison's five magnificent lakes, I invite everyone to go out and enjoy the treasured waterways all around them.

Paul Robbins
Dean, Nelson Institute

Living History

Members of the Ho-Chunk Nation paddled through the ancestral waterways of Teejop to connect with their history and show the state: we're still here.

Three Ho-Chunk paddlers guide a dugout canoe, flying the Ho-Chunk flag, across Teewąąšikhomįik (Lake Mendota). Photos courtesy of Jessie Conaway (3)

By Chelsea Rademacher

On June 20, 2022, a small flotilla could be seen off the southwest shoreline of Teewąąšikhomįik, He Who Lies There (English name, Lake Mendota). The air was still, as was the water, while the group of boats — several kayaks, a small motorboat, and a dugout canoe flying the Ho-Chunk flag — hovered 27 feet above the place where a 1,200-year-old dugout canoe was found nearly one year ago to the day. The canoe from the depths and the boats above offered onlookers a quiet, but not at all subtle reminder: *we are still here*. "Wisconsin didn't start in 1848," says Jessie Conaway, a faculty associate in the Nelson Institute for Environmental Studies. "This is *living* history. Native Americans are not in the past."

The stop was part of a weeklong experience: the Ho-Chunk Nation Dugout Canoe Journey, which gave generations of Ho-Chunk members a unique way to connect with their ancestors. "Native colleagues have taught me that boats carry culture," Conaway explains. In re-creating a traditional boat, one also revitalizes traditional tools, processes, and language: the songs once sung, and the stories once told.

"The places we're paddling in, these are cultural spaces that have their own stories and associations. It's a lot more than a boat."

Conaway, a professional paddler and lifelong "water educator and protector," was asked by the Ho-Chunk Nation's Tribal Historic Preservation Officer, Bill Quackenbush, to lend her expertise on the trip. She and her 17'9" Nigel Dennis sea kayak provided on-water support as the group paddled the ancestral waterways from the north shore of Teewąąšikhomįik to Kechunk ciinak, (Turtle Village) on the Rock River.

"We began up in Waunakee celebrating our UniverCity Year partnership that my students and I helped to facilitate between Ho-Chunk Nation and Waunakee," Conaway says. "On Mendota, we did a brief ceremony to ask for safe passage, and then we launched." Though the journey's dugout canoe was newly constructed by Quackenbush and his team, the paddlers had a chance to visit the ancient dugout, which is currently undergoing preservation at the State Ar-

The view from Conaway's 17'9" sea kayak, which provided on-water support for the journey.

chive Preservation Facility — conveniently located along the Yahara River between Mendota and Monona.

Their route continued through Teejop (Four Lakes) as the paddlers wound their way through the Yahara and Rock Rivers — "the heartbeat of Ho-Chunk ancestral territory," says Conaway. Each stop along the way met with cheers and smiles from Ho-Chunk Nation and non-tribal citizens alike. "The whole entourage would be there on the bank. Looking at those faces from the water — their faces looked like the sun emoji!" Conaway remembers. The journey culminated at Kechunk ciinak, where the Rock River joins with Turtle Creek in Beloit, Wisconsin, a traditional Ho-Chunk village.

One of the most meaningful stops for Conaway was at a 12,000-year-old Ho-Chunk cultural site on the Yahara River between Lakes Waubesa and Kegonsa. "We hovered over by this ancient fish weir, and Bill talked for a long time about this place. I'm learning history on the water from them, and Bill's in a dugout canoe talking about it. This is unforgettable," Conaway reflects. "You could hear a feather drop on the water."

See photos from the journey on the Ho-Chunk Nation's Facebook page.

The dugout could hold three to four paddlers at a time, and participants took turns paddling as the journey progressed.

Danger on the Mississippi

A report from the Wisconsin Initiative on Climate Change Impacts shows how Wisconsin communities and habitats along the Mississippi River are at risk.

By Dea Larsen Converse, Wisconsin Initiative on Climate Change Impacts

Flooding has caused damage to transportation infrastructure on the Mississippi River. Mississippi River lock and dam under water during 2019 flood in the Rock Island District, Iowa. Photo credit: United States Army Corps of Engineers

"Climate change adaptation projects in backwater areas of the Mississippi are vital to maintaining productive local fisheries and access to quality fishing opportunities."

– Shawn Giblin, WICCI Mississippi River sub-group co-chair

WICCI
WISCONSIN INITIATIVE ON CLIMATE CHANGE IMPACTS

From tourism to agriculture to biodiversity, the stretch of the Mississippi River that borders western Wisconsin is a critical resource — and one that is put at an increasing risk due to climate change. A focus on climate impacts from the Wisconsin Initiative on Climate Change Impacts (WICCI) shows the Mississippi River communities and habitats in Wisconsin are at risk due to the increasing variability in river flows caused by changes in precipitation, snow melt, storm intensity, and land use. The last two decades have been the warmest on record in Wisconsin and the past decade has been the wettest. Extended high water and fall flooding have occurred on the Mississippi River in seven of the last 10 years.

The Mississippi River provides Wisconsin with an array of services and natural capital. The 33 historic river towns and villages along the Wisconsin Great River Road, 250 miles along the Mississippi River, is a major tourism attraction. The agriculture sector relies on the river for deliveries of agricultural chemicals and shipments of commodities. The excessive volume of water impacts tourism, causes damage to transportation infrastructure, and delays deliveries of agricultural chemicals and shipments of commodities. High-water years also deliver sediment and nutrients that lead to harmful algal blooms and contribute to the expansion of the Gulf of Mexico hypoxic zone.

Hundreds of thousands of migrating waterfowl rely on the aquatic plant populations in the river as a critical food source. Waters in the river floodplain away from the main channel, known as backwater lakes, are central to the biological pro-

High and variable flow conditions are causing significant damage to the Mississippi River ecosystem. Floodplain trees as the water levels decline after the 2019 flood. La Crosse, Wis. Photo credit: Kathi Jo Jankowski

ductivity and diversity in the system. They provide refuge from the high flows in the Mississippi, habitat for fish to spawn and overwinter, and essential habitat for waterfowl and other wildlife. High and variable flow conditions associated with climate change are causing significant damage to these and other Mississippi River habitats, such as floodplain forests.

The WICCI Mississippi River Group recommends actions to make the Mississippi River basin more climate resilient, including restoring natural areas, investing in flood risk reduction practices and pre-disaster mitigation programs, and developing a two-dimensional hydraulic model to help with Mississippi River habitat projects, community flood risk evaluation, and management. There is hope for the future — but it's up to us.

Support WICCI

The Wisconsin Initiative on Climate Change Impacts (WICCI) is a statewide collaboration of scientists and stakeholders formed as a partnership between UW–Madison's Nelson Institute for Environmental Studies and the Wisconsin Department of Natural Resources. WICCI's goals are to evaluate climate change impacts on Wisconsin and foster solutions. Gifts to the WICCI Program Fund provide general, discretionary program support and enhance and expand WICCI's teaching, research, and public service roles. Gifts are also used to support partnership-building activities, including faculty, staff, and student recruitment, retention, and morale.

This article is part of a series highlighting the contribution from each WICCI Working Group for the 2021 WICCI Assessment Report. Next month, we'll showcase work from the Plants and Natural Communities working group.

Mississippi River Group

Impacts of climate change on the Mississippi River

Improving habitat in a Mississippi River channel

Ecological impacts of sedimentation in the Blackdeer Channel

2022 Alumni Award Winners

Around the globe, graduates of the Nelson Institute for Environmental Studies are living out the Wisconsin Idea as they teach, research, and champion the fields of conservation, sustainability, and environmental justice. Each year, the Nelson Institute honors several standout alumni whose work embodies the institute's vision of creating sustainable communities and enhancing the quality of life and the environment in Wisconsin and the world.

Alumni awards are presented in two categories: the Rising Star Alumni Award and the Distinguished Alumni Award. The Rising Star Alumni Award recognizes our most recent alumni — those under 35 years of age or who graduated within the past 10 years — who are making a significant difference in their communities through research, volunteering, or business. The Distinguished Alumni Award recognizes graduates with a notable degree of long-term success or impact in their field or communities. Honorees are recognized at the annual Rendezvous on the Terrace event, held this year on September 23.

Rising Star Alumni Award

Keefe Keeley MS'14, PhD'21
Co-Director, The Savanna Institute

Breana Nehls '16
Program Manager, American Society of Adaptation Professionals

Patricia O'Kane PhD'15
Senior Lecturer, University of Vermont Rubenstein School of Environment and Natural Resources

Distinguished Alumni Award

Margaret Krome MS'89
Agricultural Policy Coordinator, Michael Fields Agricultural Institute

Robert Ribe MS'81, MA'87, PhD'90
Professor and Director of MLA Program, University of Oregon Department of Landscape Architecture

Ashok Sarkar PhD'97
Senior Energy Specialist, World Bank

Read on to learn about each award winner, their impacts on campus, and their hopes for the future.

You're Invited!

Join us on Friday, September 23, for Rendezvous on the Terrace. Connect with Nelson Institute faculty, current students, and your fellow alumni as we celebrate this year's alumni award winners. The event is free to attend, but registration is required. Sign up today to reserve your spot!

2022 Rendezvous on the Terrace
Friday, September 23, 2022
Alumni Lounge, Pyle Center, Madison

Leave No Trace

Meet Rising Star Alumni Award winner Breana Nehls '16.

Nehls' current job took her to scenic Breckenridge, Colorado, where she often spends her free time exploring the mountains. Photos courtesy of Breana Nehls (4)

By Chelsea Rademacher

"I wanted to be a teacher when I was little. Though I've never had a formal teacher role in a classroom, I feel like I've been able to connect with a lot of students and lifelong learners."

— Breana Nehls

Every summer, typically at the start of August, downtown Madison's sidewalks transform into junkyards — or, perhaps, thrift stores for the Hippie Christmas devout. The UW's residence hall parking lots are no different. After all, who wants to lug that squeaky futon or grimy microwave back to Oshkosh or Naperville or wherever the freshman calls home? But this mindset left literally tens of thousands of pounds of junk on the campus streets, all destined for a landfill. Breana Nehls '16 wouldn't have it. While on campus, she came up with a plan to reduce some of that move-out waste. Some turned into nearly 100,000 pounds of waste annually through what is now known as University Housing's Sustainability Move Out program.

Today, Nehls works as a program manager for the American Society of Adaptation Professionals, where she connects and supports climate professionals to build the field of adaptation. She always had a passion for the environment — growing up in Manitowoc, Wisconsin, she spent her free time exploring the shores of Lake Michigan with her friends. Even then, she realized the importance of fighting to protect the world around her. "If we want this to still be here for everyone to enjoy these experiences like we are, we have to protect it," she remembers thinking. In a high school environmental studies class, she realized she could turn her interests

into a career. "What I care about can be a job?" she thought. "That's pretty cool!"

Nehls started her journey toward creating a more just, sustainable world at UW–Madison, but if she's being honest, being a Badger had never been part of the plan. Her older sister was on campus, and Nehls wanted to carve her own path. "Plus, Madison was huge and scary!" she remembers. But she was awarded a scholarship she couldn't refuse, and now, "when I look back," she says. "I would never want to be anything but a Badger."

Nehls signs a Science Hall brick – a tradition among graduating Nelson and geography students.

Science Hall became her home as she majored in environmental studies and geography, the two programs that share the iconic building at the top of Langdon Street. In the Nelson Institute, she grew her understanding of how important the human and social aspect is to environmental work. Rebecca Ryan, Nelson's distinguished undergraduate program coordinator, helped her pick a class called People and the Environment, where she learned "there's this whole human connection and behavior element to all this. It really helped ground me in the human and social side of sustainability and the environment."

As a sophomore, Nehls applied for and accepted an internship at the Office of Sustainability — "kind of on a whim," she recalls. It was a good whim to ride — after graduation, she moved into a full-time position as the sustainability coordinator for University Housing. Her legacy of sustainability can be seen across campus today, from low-flow toilets to take-out containers to a truckload of used futons at Picnic Point.

A big part of Nehls's day-to-day involved coordinating projects through the UW–Madison Green Fund, which supports student-initiated projects designed to decrease campus's environmental footprint. She connected with Andrea Hicks — director of sustainability education and research, an associate professor in the Department of Civil and Environmental Engineering, and the Nelson Institute's Hanson Family Fellow in Sustainability — and students in her Environmental Sustainability Engineering class who completed "toilet tours" throughout the residence halls. The students measured flow rates, determined which toilets needed upgrading, then connected with staff mechanics to move their recommendations forward. "It was a really good match," Nehls says of pairing students with staffers, "and definitely living out the Wisconsin Idea of connecting the experience in the classroom out into the real world."

Another Green Fund project that Nehls led was University Housing's Ticket to Takeout program, which is still in use today. "To avoid single-use plastic, single-use Styrofoam, we did a study to decide what product would be best from a student perspective, for guests visiting campus, but then also on the back end: how it impacted dining staff who would have to clean these things," she explains. Housing residents get a container at move-in, and students living off campus can buy into the program through the one-time purchase of a $5 token, which they trade for a reusable to-go container when picking up their food at the dining halls. Users get their token back after returning the containers to a drop box, where they are cleaned and put back into rotation by dining staff. "We got a campus improvement award for the Ticket to Takeout program," Nehls says. "That was a really big accomplishment."

In addition to receiving an award, Nehls also presented her work at conferences and published journal articles alongside Green Fund program manager, Ian Aley. "Bre sets people at ease, draws out the best in others, and offers confident and collaborative leadership," Aley said of their work together, noting Nehls' deep passion for sustainability. "She is a Nelson graduate worth celebrating!"

But perhaps Nehls' biggest impact on campus — at least

as far as sheer weight goes — was Sustainability Move Out. During the annual eight-day move-out period, 10 collection sites pop up across campus. Volunteers sort through the drop-offs, flagging things either for appropriate recycling or donation. Books go to St. Vincent de Paul. Nonperishable foods go to the Open Seat student food pantry. There's even a special site for futon collection out at Picnic Point. "It was a really big undertaking involving partners throughout different departments at University Housing, across campus, and community partners," Nehls says. "Each year, we were able to divert over 100 thousand pounds of material from the landfill."

At the Office of Sustainability, Nehls found joy in "empowering students to really leverage the impact that they have on campus."

One of Nehls' lasting legacies on campus is the Sustainability Move Out program, which collects refuse and donations to be properly recycled and distributed.

To get more peoplepower at the collection stations, Nehls once again turned to the students. She connected with professors who would offer credit to students for volunteering. On top of getting class credit, there was also a critical education component to working at the drop sites.

Nehls (top row, second from right) enjoys a Terrace afternoon with her colleagues from the Office of Sustainability.

"They were like, 'Oh, there's an option for me to not throw this away?' " Nehls explains. Having an alternative option was an introductory step for students to think critically about their sustainability habits.

Her connection with students gets back to Nehls's earliest career aspirations: "I wanted to be a teacher when I was little," she remembers. "Though I've never had a formal teacher role in a classroom, I feel like I've been able to connect with a lot of students and lifelong learners." She's proud to know that her efforts had a lasting impact on campus, but she's even more proud when the students she's worked with get that same feeling: "empowering students to really leverage the impact that they have on campus," she says.

That space of empowering others to create sustainable solutions is the path Nehls sees for her career. "I always want to be in a position where I'm creating a space where people feel like they can continue to do this work," she says. "It's hard work. Whatever I can do to keep that light burning in them is what I want to do."

Breana Nehls '16 is one of six Nelson Institute alumni award winners. Their stories are featured throughout this magazine and online .

In the Shadow of the Old

Meet Rising Star Alumni Award winner Keefe Keeley MS'14, PhD'21.

The Hillside Farm's sylvan pasture incorporates agroforestry principles into cattle ranching. Photos courtesy of Kevin Koch (2)

By Kevin Koch

"We're building the new in the shadow of the old," Keefe Keeley MS'14, PhD'21 mused as we meandered about the fields and woodlands of the Savanna Institute's North Farm, five miles from Spring Green, Wisconsin. Our walk took us among young walnut trees, cedars, hayfields and newly sown rye in the shadow of a ridgetop forest. In the valley, hazelnut saplings had recently been planted in recurring strips between plots of alfalfa ground cover. "We're working toward a perennialization of agriculture, plus some," Keeley added.

"What's the positive action where we can do more, and have healthier food and better farming economies as well?"

— Keefe Keeley

Keeley is the executive director of the Savanna Institute, a Southwest Wisconsin-based nonprofit organization promoting agroforestry, or the incorporation of forestry into Midwest farming. Trees protect against soil erosion, keep nutrient runoff from entering local streams, and provide windbreaks, shade for cattle, and wildlife habitat. Sometimes the timber and tree fruits are crops themselves. All this while sequestering carbon in the fight against climate change. Keeley knows a thing or two about agroforestry and agroecology: he earned both his master's and PhD in agroecology through UW–Madison's Nelson Institute.

Savanna Institute's origins trace back to 2013 in central Illinois as forestry and agriculture graduate students at the University of Illinois at Champaign–Urbana began working with community farmers to explore more diverse, economically viable options for farming. They hoped to shift away from the typical monoculture row crop model, explore markets for new crops, and make agriculture part of the climate change solution.

While completing his master's degree, Keeley joined Savanna Institute in 2013 as its first director. Now centered in Spring Green, Savanna Institute has grown from having Keeley as its sole (part-time) employee to a current full-time staff of 31 whose positions range from biological and soil scientists to marketing and community outreach special-

ists to hands-on farming experts on its four recently acquired agricultural properties in the Spring Green area.

Spring Green is part of the Driftless Area, an ecological curiosity that stayed unglaciated during the Ice Age, thus lacking in the glacial drifts seen throughout the rest of the state. This region is another thing that Keeley knows well: while working toward his PhD, he coedited a book about the interwoven human and natural history of the region. In addition to its location, Savanna Institute takes its name from the prevailing ecosystem that graced the Driftless Area prior to Euro-American settlement: the oak savanna. Savannas were not quite forests, not quite open prairie. In oak savannas, hardwood oaks and hickories dotted the landscape in groves or solitary stands with prairie grasses and wildflowers growing beneath and between them.

That's where the "old" and "new" come in. Keeley points out that Indigenous peoples farmed amid the savanna, and even the earliest Euro-American pioneers kept much of the surrounding woodland intact. But economic pressures eventually led to mechanized, fencerow-to-fencerow farming. Agroforestry revives "old" paradigms of maintaining and tending trees in an agricultural setting. The "new" comes from modern research methods for studying and breeding the best combinations of trees and row crops.

Noting that farmers are constrained by enormous economic pressures, Keeley emphasizes that the Savanna Institute is "not wagging a finger at anyone" in regard to conventional modern agricultural practices. Rather, the goal of the organization is to "put some new tools in the farming toolbox."

Savanna Institute purchased what they call the North Farm in 2020. The farm's seller was interested in the organization's conservation mission. He had already planted a walnut grove on the upslopes of the farm property and helped place a conservation easement on part of the property that lay along the Wisconsin River to preserve its marshy backwaters as habitat for migrating waterfowl.

Keeley found that the Spring Green farming community was equally supportive of Savanna Institute's goals. In fact, local conservation-minded landowners helped recruit Savanna Institute as a buyer and contributed toward the purchase. "Southwest Wisconsin offered a community already engaged in conservation and agricultural innovation. They were already pushing the envelope of what 21st century agriculture might look like," Keeley says, with their interests in organic farming, rotational farming, farmer-led watershed groups, and community-supported agriculture (or CSAs). Many in the region were already practicing Aldo Leopold's maxim "to live on a piece of land without spoiling it," he adds.

North Farm serves as a working commercial farm, demonstrating what agroforestry might look like, how mechanization fits in, and how economic realities can be met. As we walked along the hazelnut plantings in the alfalfa field, Keeley talked about land equivalency ratios. Scientific agricultural studies have shown that tree crops and row crops grown separately may take 1.4 acres to produce what can typically be grown on one acre when intermingled. Tree and row crops often mature at different times, meaning that harvesting the one crop won't disturb the other. And since their roots are deeper, trees can actually help row crops by bringing water up to the surface level even beyond what they use themselves.

And there is the added benefit to wildlife. As we toured, we encountered butterflies in the alfalfa and a hummingbird among the hazelnut plantings. Keeley loves to hear the insect and bird songs amid the fields.

North Farm is 331 acres, including 200 acres of woodland. But three other recently purchased farmsteads bring Savana Institute's total to 778 acres. Valley Farm, located in the sandy flood plain of the Wisconsin River, will be devoted to tree crop research using cutting-edge agricultural science. Located near popular tourist destinations like Frank Lloyd Wright's Taliesin and the American Players Theatre, South Farm will serve an educational purpose, introducing the general public to agroforestry.

The newest acquisition, Hillside Farm, is a sylvan pasture cattle ranch obtained just this past March. Here, Keeley explains, the goal will be to study the effects of grazing cattle in an existing oak savanna. But Hillside Farm is also arguably the most aesthetic of the four properties. A short hike up to its commanding wooded bluff reveals a view of Taliesin in the distance, and sweeping woods, farm fields, and lightly traveled roads in every direction. The previous owner had built a sprawling, light-infused, Wright-inspired house that will serve as a community events center and a meeting place for the Savanna Institute.

Keeley laments that in the face of climate change and other environmental threats, "people feel pretty powerless, and are typically told to *do less*." Savanna Institute, he says, asks instead, "What's the positive action where we can *do more*, and have healthier food and better farming economies as well?"

Keefe Keeley MS'14, PhD'21 is one of six Nelson Institute alumni award winners. Their stories are featured throughout this magazine and online . This story was originally published by Kevin Koch, professor of English at Loras College.

From the Catbird Seat

Meet Rising Star Alumni Award winner Trish O'Kane PhD'15.

O'Kane loves birds of all kinds, including her backyard chickens like Maeve, pictured here. Photos courtesy of Trish O'Kane (3)

By Chelsea Rademacher

Megan's special place was a tree. It was a big, old elm in Warner Park, where she spent the afternoons with Bird Buddies, her after-school group. What made the tree so special was its hollowed-out base — a hollow that perfectly fit the Sherman Middle School girl and her collection of twigs and rocks. But what Megan saw in the hollow as magic, the City of Madison parks department saw as a safety hazard. No number of letters or meetings or phone calls would change their mind, though the community tried. The parks department cut Megan's tree down. When she saw the empty place where her tree had been, Megan sat down in the grass and cried. Bird Buddies' founder and leader, Trish O'Kane PhD'15, tried to comfort her, rationalizing that the parks department was just trying to keep Megan and her friends safe. "But it was still alive," Megan sobbed into her knees. *It was still alive*.

"I realized then how adults acquire these layers over our hearts — these layers of rationalization. That it's *okay* to cut down a tree. That it's *okay* to kill the animals. That it's *okay* to fill in a wetland. That all this stuff is okay," O'Kane reflects. "[Megan] taught me that we need to preserve that childlike clarity about what's right and what's important."

O'Kane remembers exactly where and when she emerged from her rational adult layers and began to question the world around her. She was wading through toxic sludge — one part exploded paint cans, two parts ceiling insulation — in what used to be her living room. It was October 6, 2005: 40 days after Hurricane Katrina nearly wiped New Orleans off the map. After working for 10 years as a human rights journalist in Central America, O'Kane had accepted a teaching position at Loyola University in New Orleans. On Monday, August 29, she *should* have been teaching her very first class — an 11:30 a.m. freshman communications lecture. Instead, she and her husband had fled to Alabama as the hurricane submerged their new home, along with their entire Lakeview neighborhood. October 6 was the first time she was allowed to go back. There was no need for keys when she arrived; the National Guard had kicked in all the doors searching for bodies. Ninety of her neighbors had drowned.

"Birds teach me perpetually to be amazed and humbled, and that gives me hope. Because if we don't know everything, there are so many things we can discover."

— Trish O'Kane

"That's when I started thinking really deeply [that] the way we live is so wrong. The way *I've* lived is so wrong. If we can't live in a biodegradable way with what we're facing right now, we're going to destroy everything," she says. "I just knew that was the next learning journey for me. I need to understand what happened, why it happened, and work so it doesn't keep happening."

O'Kane decided to leave New Orleans after the following semester. "I don't want to blame people who stayed in New Orleans," O'Kane stresses, acknowledging the privileges that come with mobility — plus she wasn't from New Orleans and didn't have any family there. "It was easy for me, after teaching that year, to say I'm not staying here

anymore. I can't go through this again," she says. While she finished out her first and final semester (in January, after the university reopened), O'Kane needed a distraction — something happy to dampen the stresses of teaching college freshman in Katrina's aftermath. So she bought a couple of birdfeeders.

"Birds were my first teachers of ecology," she says. "As I watched them at the feeders, I noticed there seems to be a pecking order. Why does one get the seed first?" She wondered. "Where do they get their water from? And you notice maybe they go to a puddle. If they drink out of a puddle, what if chemicals are in that puddle? What if car oil is leaked into that puddle?" The birds had raised even more questions, so seeking answers, O'Kane headed north to pursue a PhD in the UW's Nelson Institute for Environmental Studies. There, she found Warner Park, an elm tree with the perfect hollow, and the gray catbird.

Birds are the greatest teachers for O'Kane and her students. Pictured here is "Ollie the Owl," a barred owl that lives in the woods outside Flynn Elementary where O'Kane currently works.

Under the tutelage of her PhD advisor Jack Kloppenburg, O'Kane began to learn about the world around her. "It was a fabulous place to go to school to try to figure out what happened in New Orleans," she says, but as she settled in Madison, she started to notice how similar Madison and New Orleans are. "It's a city that's more water than land," she observed. In her studies, she learned that most of Madison used to be a marsh, including her new neighborhood of Warner Park. And when it rains? "The water remembers," O'Kane explains. "The marsh returns. It doesn't matter if you pave it over." Just like her home in Lakeview, her new nest in Warner Park was built on a wetland. But O'Kane quickly learned that her neighbors had been defending that wetland for decades. "My PhD turned into a community project," she says, and she's filled with pride to see the group — Wild Warner — still thriving today.

Within Warner Park, O'Kane met a new group of avian tutors. One piece of her PhD work was a geolocation study of the park's gray catbirds — directed by the aptly named Anna Pidgeon. The gray catbird is about the length of a robin, but much thinner. A relative of the mockingbird, they're known for their boisterous vocalizations and fiercely territorial nature. O'Kane and Pidgeon were curious about the catbirds' migratory habits, so they placed tiny geolocator backpacks on the birds to see where they ended up. "They came back a year later, and we discovered they'd gone to southern Mexico, the Yucatán, and northern Guatemala," O'Kane says, still in awe. "How does a bird that size cross the Gulf of Mexico and come back in good health," she pauses, "with a little, tiny backpack on its back?"

Perhaps the biggest piece of O'Kane's work in Warner Park — the piece that laid the groundwork for her current role as a senior lecturer at the University of Vermont (UVM) — involved a Sherman Middle School class and a tree-loving girl named Megan. In 2010, O'Kane launched the Bird Buddies (now Nature Explorers) after-school program, which used birding as a way to teach kids about their world — just like the birds had taught O'Kane. The program paired the middle schoolers with college mentors — students in O'Kane and Kloppenburg's Environmental Studies 600 capstone class. Once a week, the buddies would walk the mile between their school and the park and explore nature.

"It was a bit out of the box for a science PhD," O'Kane admits, remembering how she approached Kloppenburg with the pitch to energize kids about nature. But Kloppenburg was fully on board. "He not only approved it, he helped me teach the class!" Kloppenburg joined the Bird Buddies for a winter day of sledding. On Valentine's Day, he brought them all bird-shaped chocolates. He even testified in public meetings on behalf of Warner Park's geese.

"If you want to be really effective, you have got to organize," Kloppenburg told O'Kane when she pitched the idea. "Organize?" O'Kane asked. "This is a PhD. I thought I have to read stuff and sit in a library. But Jack was like, 'You have to organize.' And he was right." It's a lesson she never forgot.

O'Kane flew the UW nest in 2015 to join the faculty at UVM's Rubenstein School of Environment and Natural Resources. Today, she shares the lessons of her birds with a new group of students through her Birding to Change the World course, which pairs UVM undergrads with kids at the local Flynn Elementary School (home of the Flynn Fire-

flies). Whenever her students are feeling down or frustrated, or they don't feel like they can make a difference, O'Kane tells them the story of Warner Park. "It's just one little wetland, but if everybody who loves their place would defend it the way the birds do, with their *lives*," she emotes, "we could have a patchwork quilt of solutions."

O'Kane and her students observe both winged and four-legged creatures. Here, she points out a beaver.

"Birds teach me perpetually to be amazed and humbled, and that gives me hope. Because if we don't know everything, there are so many things we can discover," O'Kane reflects. "Maybe there's some solution sitting right in front of us if we can just slow down long enough to notice."

Whether she knew it at the time or not, since the day that O'Kane waded into her home in 2005, her brain has been formulating a book. It's about her teaching, but perhaps more importantly, her learning: the lessons she's gathered from her students and her birds. In May 2023, Harper-Collins-Ecco will publish *Birding to Change the World*. "When the birds return," she says with a smile.

Trish O'Kane PhD'15 is one of six Nelson Institute alumni award winners. Their stories are featured throughout this magazine and online.

The Connector

From messengers to legislators and dairy farms to shrimping boats, Margaret Krome has built her career on creating change through connections.

By Chelsea Rademacher

Margaret Krome finds connections everywhere. Even in casual conversation, she draws lines between completely unrelated things to make points so clear that you wonder why you haven't always seen it that way. For instance, to Krome, University of Wisconsin–Madison as an *estuary*. It's a space of transition where different streams meet, their exchange creating some of the most nutrient-rich habitats on earth, before flowing out to the open sea.

If the UW is an estuary, then Krome navigated quite the river to arrive here. Her headwaters were in Virginia, where she grew up and went to college. She'd always had an interest in the environment; as a young girl, her family spent Christmases downstream in Florida in her grandparents' avocado groves and informal botanical conservatories. And though she majored in English

literature, it only took a few just-for-fun botany and forestry classes for Krome to know that, eventually, she wanted to work in natural resources management. But first, she meandered north to Washington, DC, to work as a lobbyist for poverty and legal aid issues.

After a few years in DC, Krome joined the Peace Corps. She enjoyed the work, but realized she wanted something more permanent — something where her passion for sustainability could take root in a community. And so, from a hut in northern Cameroon, she started applying to graduate schools and was accepted to the UW's Nelson Institute for Environmental Studies. Her estuary. In its interdisciplinary waters, Krome soaked up every piece of information she could. "I was allowed to pick and choose from different departments, different disciplines, and get the information that would be helpful to me," she says. "That was a very important gift from the Nelson Institute."

While on campus, Krome put some of her DC-era skills into practice. With the mentorship of then legislative liaison for Wisconsin's agriculture department, Jim Arts, and advice from UW–Madison and UW–Extension administrator Ayse Somersan PhD'69, Krome led a campaign to create the College of Agricultural and Life Sciences' Center for Integrated Agricultural Systems, which still exists today.

Krome has spent her career coordinating grassroots efforts to support sustainable agriculture. How? Through connections. She finds the right people to get the right message to the right policymakers. "I see it as something of an art form," she says. "I live the life of working with farmers, connecting them with members of the legislature, with members of Congress, and having their voices carry the day." It's rewarding work, and something that gives her immense hope for the future. "People can be empowered to advance an agenda that they did not think they could advance — and to succeed."

Today, Krome works as the policy director for Michael Fields Agricultural Institute, a small nonprofit in southeastern Wisconsin focused on food and farming systems. Much of her work has been in federal appropriations and "earmarks," or congressionally appropriated funding for longer-term research and outreach projects. In the past two years, she worked with Wisconsin Senator Tammy Baldwin to restore partial funding to the Grazing Lands Conservation Initiative, a USDA program that provides technical assistance and grazing education to farmers nationwide — everything from developing paddock systems for livestock to checking income flows.

This year, Krome helped get a bill through the Wisconsin State Legislature with unanimous, bipartisan approval. It includes a cover-crop incentive program: farmers who plant fall cover crops can receive $5 per acre reduction in their crop insurance premium. These small-grain crops — oats, barley, wheat, rye — are critical, but underused. They pull up important nutrients from low in the soil profile, hold soil and capture water, plus they serve as a nurse crop, protecting smaller crop seeds like alfalfa while they take root. In addition to seeing the bill through the legislature, Krome is also studying why more Midwestern farmers *don't* plant cover crops. "Wisconsin farmers currently only grow about a fifth of what we grew 50 years ago," she explains. Increasing that percentage will not only diversify Wisconsin farmers' production, but also improve the state's soil and stream health — and further downstream, the livelihood of shrimpers in the Gulf of Mexico.

"I live the life of working with farmers, connecting them with members of the legislature, with members of congress, and having their voices carry the day."

— Margaret Krome

What connects Gulf fishermen and Wisconsin's farmers, two industries removed by 1,000-plus miles? "They inherit our water," Krome explains, and when she does, the connection seems obvious. "They inherit bad water quality, and they also inherit too much water." She's referring to the dead zone, a

Muddy fresh water from the Mississippi River flows into the Gulf of Mexico. Photo credit: NASA.

stretch of the Gulf that, due to heavy nutrient loads from the Mississippi watershed, is low in oxygen, making it inhabitable for marine life. In 2016, Krome recognized this connection and forged a cultural relationship between the fishermen and southwestern Wisconsin farmers.

The two groups travel and visit each other's operations. When it's Wisconsin's turn to host, Krome houses the fisherman not in hotels, but on the actual farms. The two seemingly disconnected groups have shared their homes, experiences, and meals — the fisherman bring fresh Gulf seafood with them to serve alongside Wisconsin's famed bratwursts. "We serve Gulf shrimp at our field days as a way of pointing out the relationship between what we're talking about here [in Wisconsin] and the livelihoods of people we don't see, but whom we now know," she says. The connection is working. "The nutrients running off our fields are contributing to the dead zone in the Gulf of Mexico," said farmer Michael Dolan after a 2017 trip to Louisiana's bayou country. "I feel more of a connection to the people down here, and I really don't want to negatively impact their lives."

"Where I feel our work needs to build is toward deeply respectful engagement with people of color and marginalized communities … with the most support and fewest strings attached possible."

— Margaret Krome

Krome doesn't just find connections, she creates opportunities. She's proudest not of her own wins, but the successes of those around her. She calls out two programs that her staffers saw to fruition and that Wisconsinites will be familiar with. The first is Buy Local, Buy Wisconsin (BLBW), a grant program introduced in 2008 to help increase the sales of local food products. There's also the Wisconsin Farm to School program, launched in 2009, which promotes the use of local food in school meals.

Both programs are still going strong today and have had significant impact to the state. A 2020 BLBW impact report shows that the program had created 138 jobs and increased the sale of Wisconsin products by more than $12.69 million. In October 2021, Governor Tony Evers named October as Wisconsin Farm to School Month to celebrate the program's impact. "I'm proud that it was not I working with the Legislature, but my staff person who led. That's something on their resume for the rest of their lives. I'm proud of cultivating other people's capacities."

Graphic courtesy of Wisconsin Department of Public Instruction.

As she looks to the future, Krome reflects on what's most important. Climate change and the environment are paramount, of course. "But where I feel our work needs to build is toward deeply respectful engagement with people of color and marginalized communities to give them agency to advance their agenda with the most support and fewest strings attached possible." She's proud to work at an organization that has had an "unambiguous and long-standing commitment" to racial equity and justice in agricultural work.

In her personal life, Krome is taking some of that work to her local community by doing what she does best: connecting. She connected with Filiberto, a Michigan blueberry farmer whose Latinx growers group was being squeezed out of their market by white farmers. She connected with Amber, who works with Black vegetable and pecan growers in southwest Georgia who were offered them $12 per box less than their white counterparts. And then, she connected Filiberto and Amber with several hundred Madisonians interested in direct-buying their produce. Twice a year, Krome's garage turns into a distribution center for blueberries, pecans — and yes, Gulf shrimp.

Margaret Krome MS'89 is one of six Nelson Institute Alumni Award winners. Their stories are featured throughout this magazine and online.

Sharing Credit Where Credit Is Due

Meet Distinguished Alumni Award winner Robert Ribe MS'81, MA'87, PhD'90.

Ribe presents an in-the-field lecture to foresters. Photos courtesy of Robert Ribe (4)

"It really is a discipline to make good things happen that are very hard to make happen. Nobody else can do that but people who are doing environmental studies."

— Robert Ribe

By Chelsea Rademacher

When Robert Ribe was 17 years old, his mother handed him a book. It was *Design with Nature*, published in 1969 by Scottish landscape architect, Ian McHarg. The book itself was ground-breaking — it helped catapult the fields of landscape architecture and environmental planning into the mainstream. And for Ribe, it set his future in motion. "That was when I decided to become an environmental planner," Ribe says. Which is exactly what he did.

As the field of landscape architecture flourished, so did Ribe's career. His expertise has taken him across the globe — from Tasmania, where he helped design ecological timber harvest methods, to Zurich, where he studied planning methods to overcome public opposition to new wind-farm designs and locations. He even played a role in resolving the spotted owl controversy of the 1990s by leading research to implement the Northwest Forest Plan in a way that would sustain public support, maintain the endangered species' population, *and* allow for timber harvest.

Traveling the world was part of Ribe's upbringing. His father, a nuclear fusion researcher, often took the family on trips. "He was super energetic at taking us all over the world and all over the country to see places," Ribe recalls. "I got to see the world and all kinds of people and places. I was fascinated by that." At the age of eight, his family spent a year living in Europe — Switzerland, Austria, and Bavaria. "That's the perfect, impressionable age when you decide you want to help keep the world that way."

One of the Ribe family's travels in the 1970s— stateside, this time – was to an energetic college in the Midwest: Madison. Ribe was in high school when his father attended a conference on nuclear fusion. "He took my little brother, me, and my mom, and we lived in Madison for two weeks — in Witte Hall!" Ribe remembers. While Dr. Ribe attended the conference and Mrs. Ribe met with friends, the brothers explored. They ate at Gordon Commons and the Memorial Union, walked all over campus, and even rented a sailboat from Hoofers. "After you do that," Ribe says, "you think, 'this is a really cool place to go to school.' That's probably what got me to Madison, was the time I spent there as a kid."

The campus clearly left an impression, as Ribe came back after completing his undergraduate degree at the University of California–Riverside.

He became a triple Badger, earning his MS in landscape architecture, MA in agricultural and applied economics, and PhD in land resources from the Nelson Institute for Environmental Studies.

In 2015, Ribe was selected to the American Society of Landscape Architects Council of Fellows, one of the highest honors in the field.

Ribe's time on campus left lasting effects on the state — or at least, he "likes to pretend" it did, he humbly quips. Ever ridden on the 40-mile Military Ridge State Trail? In Ribe's first design studio, led by former landscape architecture professor Phil Lewis, the class was tasked with recommending which abandoned railroads should be turned into bike paths. Military Ridge was one of Ribe's recommendations in the final report.

Projects like this, coupled with mentorship and expertise from Nelson faculty, set Ribe up as an expert in his field. "The main work I've done in my career is helping communities of people and policymakers understand and identify solutions to very complex problems that the public would support," he explains, armed with a list of UW faculty whose interdisciplinary expertise helped him along the way: "Tom Bonnicksen taught me the whole framework around which public policy and landscape planning interact. Rick Chenoweth taught me how to do public survey research. Don Kanel taught me how economic issues play into public policy. Mark Hansen and Joe Buongiorno taught me how to perform and critique policy analyses. Don Crawford taught me how aesthetic perceptions are often powerful and central to public perceptions. Tom Lamb and Bruce Murray taught me about public participation. Stanley Temple and Jeff Steir taught me how conservation and forest ecology relates to environmental planning. That mix of interdisciplinary skills that they taught me was invaluable."

Today, Ribe considers Eugene, Oregon, home. He's been on the faculty at the University of Oregon since 1988, teaching environmental studies, public policy and management, and landscape architecture. He also served as director of the university's Institute for a Sustainable Environment. He tells his current students that the field of environmental studies isn't just interdisciplinary, it's a *discipline*. "How do you produce things for the public that don't produce themselves? It's a complex, multitopic discipline," Ribe says. "I have always felt that way from the time I got to the Nelson Institute. It really is a discipline to make good things happen that are very hard to make happen. Nobody else can do that but people who are doing environmental studies."

When it comes to teaching the next generation of environmental stewards, Ribe advises his students to take classes that "don't look like you should take them." He recalls taking a UW class in econometrics, taught by Rubin Busse. As Professor Busse took attendance, he paused at Ribe's name: "You're an environmental studies major?" he asked. "Those skills that I learned in that class, I use every day. I'm using them *today*," Ribe says, gesturing at the stack of papers across his desk — work that includes a National Science Foundation project (that has an impending deadline) to understand why land owners in western states aren't reducing wildfire fuels on their land, as well as a Pacific Northwest National Laboratory grant (that also has an impending deadline) to write new zoning and building codes that will create more urban niches for solar panels.

Ribe has been a visiting professor at the Swiss Federal Institute of Technology. Pictured here, he awards a PhD student with an impressive Lego mortarboard.

"You can find solutions, you can make progress, if you're sensitive to [people's concerns] and actually touch the grassroots organizers and public officials in robust and nuanced ways."

— Robert Ribe

In the 30-some years since earning his PhD from the Nelson Institute, Ribe has garnered quite the collection of feathers in his cap. But he emphasizes that he's not a solo act. "Everything is teamwork," he says. "I've been deep in richly collaborative processes." One of those collaborative processes also happens to be one of his proudest moments so far. In 2015, New Mexico's Valles Caldera National Preserve was transferred from a private trust into the National Park System, and then in 2019, added to the Bandelier National Monument. Around that time, Ribe served as the primary expert witness in a case that built support for preservation and, ultimately, prevented a 300-kilovolt power line from running directly through the landscape. Ribe went through a full deposition, was on the stand for four days, wrote legal briefs against the other experts (something he credits UW professor Ben Nieman with teaching him) — and did it all pro bono. "The activists should get all the credit," Ribe interjects. "I couldn't have succeeded toward that National Park without the Pueblo peoples and other stakeholders. They deserve as much credit as anybody."

As Ribe looks ahead — perhaps to retirement, perhaps out of university administration and back to theoretical work — he tries to hang onto hope for the future. And to do that, he does what he does best: thinking about the complex relationships between people and the environment. "Understanding how the world works is more important than understanding how the environment works," Ribe believes. "People are the main obstacle to solving environmental problems." It seems like an insurmountable problem, but it doesn't have to be. "You *can* find solutions, you *can* make progress, if you're sensitive to [people's concerns] and actually touch the grassroots organizers and public officials in robust and nuanced ways," Ribe says. "I've made a living just learning how to listen to and work with all kinds of people of all political ideologies and attitudes. I can appreciate them and understand them. There is hope if more people will do that."

Ribe enjoys hiking in his free time. One of his all-time favorite places to explore is Interlaken, Switzerland. Photos courtesy of Robert Ribe

Robert Ribe MS'81, MA'87, PhD'90 is one of six Nelson Institute alumni award winners. Their stories are featured throughout this magazine and online.

Creating a Cleaner Future

After working in over 40 countries, helping contribute toward a more sustainable world, Ashok Sarkar is filled with hope for the future.

By Chelsea Rademacher

Sustainability came into Ashok Sarkar PhD'97's consciousness on a roof on a New Delhi summer night. The electricity had gone out, as it often did, and the nighttime low of 100-plus degrees Fahrenheit stifled the one-bedroom apartment that Sarkar shared with his parents and sibling. But outside, on the flat roof of their building, there was a breeze. On nights like this, the rooftops of New Delhi, India, played host to a neighborhood-wide outdoor slumber party.

"You started appreciating the value of electricity and the reasons to save energy, or how to rely on renewable resources in many ways," Sarkar remembers. Across years and continents, Sarkar built his knowledge of clean energy and translated it into a decades-long career at the World Bank, a multi-lateral financial institution aimed at reducing poverty and promoting shared prosperity through sustainable development. Those childhood nights spent sleeping on the roof instilled in Sarkar the importance of surviving with little. "Growing up, we realized that it's always good to be prudent in the use of resources that are limited and non-renewable: the idea of saving and not exploiting more and more," he says. "Surviving with little is one thing that we learned in our day-to-day life. It got deeply ingrained in my DNA."

"It's easy to say, 'well, just have lots of solar power and the climate-change problem is solved.' It's not that easy."

— Ashok Sarkar

In New Delhi, Sarkar completed his undergrad at Delhi Technological University, where he studied engineering — a respectable field. After college, he became a power engineer and spent four years designing coal fired-power plants for Bharat Heavy Electricals Limited. Though many of his friends continued to work in the power industry and it had good career prospects, Sarkar couldn't shake those childhood lessons of *reduce, reuse, recycle*. Climate change and environmental sustainability weren't buzzwords yet, he says, but nevertheless, he wanted to learn more.

He applied for and was accepted to a master's program in energy planning and policy at the Asian Institute of Technology in Bangkok, Thailand, which opened his eyes to the field of sustainable energy. There, he met a visiting professor from America: Wesley Foell of the Nelson Institute's energy analysis and policy program. "He convinced me that I should apply to do my PhD in the U.S.," Sarkar says. Foell was a nuclear engineer who changed paths to sustainable energy development — a similar journey to what Sarkar was hoping to realize. He applied, was accepted, and Foell sweetened the offer with a research assistantship with Dennis Ray from the Wisconsin School of Business, who eventually became Sarkar's PhD advisor.

"I ended up in Madison in 1990," Sarkar remembers. He got a true Wisconsin welcome. "That winter was the most severe snowfall in Madison. They had to close down the university!" It's true — on December 3, 1990, classes were cancelled as 13 inches of snow buried Madison. Sarkar hadn't even purchased boots yet. "That was the first time in my life that I saw snow," he remembers, a stark contrast from sleeping outdoors to survive the heat.

While in Madison, Sarkar worked for Foell's international energy and environmental consulting firm, Resource Management Associates, which worked in the developing world. "As a graduate student, I was already traveling around the world!" he says. "That's the reason it took me six years to get my PhD!" Sarkar laughs. He was so enamored with the work that he almost abandoned his PhD altogether, but Foell and Ray helped him cross the finish line. "I give them, and other friends and colleagues at UW–Madison, all the credit for what I have accomplished so far," says Sarkar.

Looking back, Sarkar sees the Nelson Institute as a pivotal stepping-stone toward a rich and multifaceted career. "The interdisciplinary thinking is so important for addressing today's challenges," he says. "The Nelson institute program is very unique in that way." He's built his career on finding different ways to look at the same problem, and ultimately find a balanced solution. "You need a combination of multidisciplinary skills and training," Sarkar reflects. "This was probably not possible, had I not gone to Madison."

After completing his PhD in 1996 and working in the U.S. for three years, Sarkar headed home to India to work for the United States Agency for International Development. "I'm an Indian — let me give back to my country," he thought at the time, but he had developed an itch for worldwide work. That led him to the Asian Development Bank in Manila, Philippines, and eventually the World Bank, where he's been for nearly 17 years.

At the World Bank, Sarkar focuses on capacity building in three main areas: renewable energy, specifically how low- and middle-income countries can achieve energy security through renewable models; promoting energy efficiency as the "first fuel"; and electric mobility, or the electrification of transport. In addition to helping countries adopt more sustainable solutions, the bread and butter of the World Bank, explains Sarkar, is large-scale lending for clean energy investments. Take, for example, electric public-transit buses. You can release an analysis on the benefits, you can gain community support, but "who is going to invest in the public bus infrastructure? Who is going invest in the electricity charging infrastructure? What are the financing incentives you're going to provide to mobilize private sector capital?" Sarkar asks. It's a bigger puzzle than most people think. "It's easy to say, 'well, just have lots of solar power and the climate-change problem is solved.' It's not that easy … unless you have the right policies and institutions in place, availability and access to finance, adequate awareness, and capacity to deliver," he says. "We think in very

Picture of vendors at night with solar street lighting in Yemen. Photo courtesy of World Bank Group

holistic ways here in the World Bank and try to connect the dots to help countries decarbonize towards a net-zero carbon future."

Since he started with the World Bank, Sarkar has lived and worked in Washington, DC, but his new home base for the next three years — just a few months old — is Jerusalem. He wanted to be closer to his project counterparts in the field, plus there was the bonus of reducing his personal carbon footprint (no more long flights across the pond for each visit). After working in vibrant countries like Mexico and China and untouched islands like São Tomé and Príncipe off the west coast of Africa, he is shifting his focus to higher conflict areas like Yemen, the West Bank, and Gaza. "These fragile and conflict-ridden countries need similar kinds of solutions as large, middle-income countries, but the challenges are unique," Sarkar explains. He wants to experiment with tried-and-true climate change solutions, but in a space where the solutions are inherently tied to the political economy and regional dynamics of the country or region. "You innovate to tailor solutions that are more attuned or resilient to the current conflict situation and associated challenges. That was the main reason I selected to come here. I could have moved to Vienna, one of the best cities in the world, but I said to myself, 'before I eventually retire from the World Bank in a few years, let me experiment with something new, more interesting, and challenging,' which is really making a difference in a fragile place like Palestine."

"The future is in good hands if it is in the younger hands."

— Ashok Sarkar

Sarkar moved to Jerusalem along with his wife, Somdatta (or Shoma, as he calls her). They're new empty-nesters — their son, Aditya, just started medical school, and their daughter, Anoushka, is in her second year of undergrad, studying architecture. Though the kids are grown, the family is still close. Every day, their FaceTime group is filled with banter. The whole family likes traveling together, too, and they're planning trips to Jordan, Egypt, Turkey, plus a road trip across Israel and the West Bank.

Sarkar's own children, as well as the rest of their generation, fill him with immense hope for the future. He's noticed how Aditya turns off lights and unplugs electronics without having to be told. "Hopefully they're not going to waste resources when they grow up as much as our generation has been wasting. Thankfully they're also well-connected, as our generation was not," Sarkar notes. He is also inspired by the rapid digitalization around the world and the emerging dominance of social media leading to a faster (and smarter) global exchange of information and solutions.

"The younger generation is the one which I'm betting my hope on," he says. "They know how everything is connected, more than my generation did." For them, electric vehicles aren't "new technology," they're just normal, he points out. "The future is in good hands if it is in the younger hands." In other words, Sarkar isn't afraid of the future. Quite the opposite, in fact: "I wish I was living in this future world."

Ashok Sarkar PhD'97 is one of six Nelson Institute alumni award winners. Their stories are featured throughout this magazine and online.

Creative shade coverings buffer sun and heat in a pedestrian street, the historic Nachalat Shiva neighborhood, Jerusalem, Israel. Photo credit: iStock

From the Desk of Andrea Hicks

A monthly column from Andrea Hicks, director of sustainability education and research, an associate professor in the Department of Civil and Environmental Engineering, and the Hanson Family Fellow in Sustainability

There's something very invigorating about the start of fall semester on campus. Returning students come back from their summer experiences with fresh ideas and perspectives. New students join our campus community, full of enthusiasm and possibility.

This fall, there are also some exciting sustainability events coming to campus. On October 26, the Office of Sustainability and the Nelson Institute for Environmental Studies will be teaming up to present a Sustainability Symposium, highlighting all of the great work in this area done by students, faculty, and staff on our campus. The symposium will consist of a keynote speaker as well as flash talks and posters from students, faculty, and staff. We are excited to build the sustainability community and highlight the work happening in all three paradigms — environment, economy, and society — across our campus. To submit an abstract to present at the symposium, follow this link. Register for the symposium here.

Speaking of community, this fall we will also debut our new Sustainability Faculty Fellows Program. This program will build a community of scholars to explore the best practices in teaching and research around sustainability. The application link for this program will be up soon, and if you would like to receive an email invitation once it is ready, please drop us a note at info@sustainability.wisc.edu. The group will meet a few times per semester.

Although the campus has been a bit quieter over the summer, our office has been bustling. Our new cohort of student interns have gone through their summer session of training, field trips, and team-building, and they are ready to make the campus a better place for all of us. You can read more about the program here. You can also get up to date on our institutional sustainability efforts by having a look at our annual and semesterly snapshots.

We look forward to seeing you all on campus this fall. As always, if you'd like to collaborate with us, don't hesitate to send us a note.

Director's Cut

Meet Will Brockliss, the new director for the Center for Culture, History, and Environment.

Photo credit: Jeff Miller/University Communications

I am writing to introduce myself as the new director of CHE. It is a very great privilege to take over responsibility for an organization that plays such a vibrant role in the life of the Nelson Institute and the university, which exists at the cutting edge of interdisciplinary research in the environmental humanities, and which has been so important to me, personally, in my time at the UW.

The pandemic was difficult for CHE, which is based so markedly on a strong community ethos and on getting out there into the world. But director Anna Andrzejewski and assistant director Rachel Gurney did a wonderful job guiding us through these challenging times. In the last academic year, we returned to in-person events, with a highly successful graduate symposium and social gatherings in Tenney Park and Allen Centennial Gardens. We were also extremely happy — and relieved! — to be able to hold the Place-Based Workshop again, after a two-year hiatus. Our visit to Blackhawk Island in the Wisconsin Dells and to important locations in the corridor between the Dells and Madison was a tremendous success. The end of the semester, however, was tinged with sadness as we said goodbye to a founding member and stalwart of CHE, Bill Cronon. We wish him all the very best for his retirement and thank him for all he has done for CHE.

Place-Based Workshop participants ride on a boat at Upham Woods Outdoor Learning Center. Photo credit: Tricia Gorby

"How do we use knowledge of the ancient world to give us some perspective on the modern crisis?"

— Will Brockliss

As we emerge from the pandemic, we have the opportunity not only to reestablish our regular roster of events and projects but also to reimagine how we can deliver them. Given the focus of our organization, I think it's especially important that we consider opportunities to strengthen our commitment to environmentally responsible research and teaching. The pandemic forced us to innovate in creating new platforms for virtual collaborations: online conferencing tools enabled us to continue our series of monthly colloquia; the recent graduate symposium took place in a hybrid format. There is no reason we cannot continue to develop such models in subsequent years. Going forward, online or hybrid events — alongside in-person colloquia and gatherings — have the potential to connect the CHE community with scholars across the country and globally.

But that's just one idea of the many we might pursue, and I'll look forward to hearing from you about your own visions for CHE. Please don't hesitate to contact me also if you'd like to know more about CHE, our plans for 2022–23, or opportunities to get involved — or indeed if you'd just like to chat. I'm looking forward very much to working with you and the rest of the CHE community in the coming academic year.

Will Brockliss
Director, Center for Culture, History, and Environment

Meet Will Brockliss

Sing, O Muse!
Brockliss' background is Homeric poetry — yes, *that* Homer of *The Iliad* and *The Odyssey*, who is known for elaborate similes, most of which are similes of the natural world. "I started thinking about how we could look at these similes as particular responses to particular environments," Brockliss explains of how Homeric poetry and environmental studies intersect, "and how they were using those characteristics to talk about the sorts of things that were going on, particularly in warfare."

Forward, with a Backward Glance
A big question that's been vexing Brockliss is how to use ancient history and culture to address the current climate crisis. "Do we look to earlier phases of human history to identify the origins of our current problems, either in harm that was carried out to the environment in those times, or in the deleterious attitudes that people developed in the past and that have been carried on today? *Or*," he punctuates, "do we instead look back to earlier points In history as examples of eras of actually more responsible attitudes to the natural environment," he asks. "How do we use knowledge of the ancient world to give us some perspective on the modern crisis?"

A Foreshadowing Intro
Brockliss and Nelson may have been meant to be. His first introduction to the Nelson Institute was through a faculty seminar, which just so happened to be put together by the folks in CHE. After that, he started attending the weekly CHE lectures ... which just so happened to be in the building adjacent to his office. "I'm now in the very unfortunate position of having a full five-minute walk to where CHE is now based," he chuckles.

In with the Old, in with the New
"So many of the virtues of CHE I want to keep in place and maintain and keep the vibrancy of, such as the CHE Environmental Colloquia, the Place-Based Workshop, the graduate symposium — all of these things are really important to what CHE does," Brockliss says as he steps into the director's seat. But there are some new aspects Brockliss hopes to introduce: "The experience of the pandemic sort of provides us with some opportunities — it's kind of unpleasant to put it that way — to rethink things. I think part of that, particularly for an environmental organization, is to rethink our environmental stewardship" — particularly, he notes, through hybrid opportunities that can virtually connect students to others across the globe — "which at the same time can reduce our carbon footprint."

New Faculty Q & A: Becky Larson

Get to know Becky Larson, who's working to make a messy field clean.

By Chelsea Rademacher

It's a messy business, manure, but it's one that Becky Larson tromps through with grace. A biological systems engineer by training, Larson's research focuses on biowaste systems — specifically manure systems and the intersection between environmental and economic cost-benefits.

Larson grew up outside of Detroit and earned her bachelor's, master's, and PhD from Michigan State University. She never wanted to be an engineer — in fact, she switched to the major her fourth year in college, resulting in a mad dash to graduation. "I came to that from the environmental perspective, but then found that I knew nothing about agriculture," Larson says, and so she soaked up as much information as she could through classes and internships. Then she stumbled into manure (metaphorically) and biogas systems, and she saw nothing but potential. "There was such an impact to the environment from it — or the potential for something so terrible to be made into something good," Larson says. "However many messy years later, I'm still doing it!"

"The real swing of the university, the energy of it, comes back in the fall. It just provides a positive charge to everything you're doing."

— Becky Larson

Biological systems engineering is a "strange" subset of engineering, Larson says. "Unlike other engineering fields where it's the actual study that ties you together, it's more of the application that ties you together," she describes. It's a perfect parallel for the interdisciplinary nature of the Nelson Institute, Larson's new home after 12 years on campus as an associate professor and extension specialist in the College of Agricultural and Life Sciences.

Learn more about Professor Larson's transition into Nelson, the climate implications of her work, and what she's most excited about for the new semester.

What most excites you about becoming a Nelson faculty member?

The Nelson Institute was a good fit because they're progressive in attitudes about what people are working on. I'm really big into sustainability. Aside from manure, I'm interested in food waste and those kinds of systems. That really fits into Nelson's stuff. I've actually had some PhD students come through Nelson, and a lot of them were working on internationally focused projects. I think Nelson houses a place where I can dig a little bit harder into my international program. I find [the interdisciplinary nature] interesting and scary at the same time. I think it's scary for a lot of us. You're trying to work with others and make the process more inclusive to other thought processes. [But] I find it interesting because I think it leads us to better outcomes. The more different thought processes you send into a problem-solving thing, the better your outcomes will be.

Your expertise is in biogas systems. Can you break down that concept for me?

[Biogas systems] are anaerobic digesters, and they're actually pretty old and simple technology. You take a waste product, you contain it without oxygen, and then natural occurring microorganisms produce methane as a byproduct. You capture that methane — we call it biogas — and then you can use it. You can burn it to make heat. You can put it in a generator to make electricity. You can clean it up and inject it into the natural gas pipeline [or] compress it and use it for compressed vehicle fuel. There's even some work we're doing now with some teammates who are trying to make it into aviation fuel. There's a whole lot of cool things you can do with it. That's part of my job: researching different things that might make the tech-

Agriculture contributes to about 10 percent of greenhouse gas emissions. Photo credit: Bryce Richter / UW-Madison

nology more feasible. The other part of my job is to help people understand how to integrate these kinds of systems and what the benefits [and] costs are.

How does the cost benefit weigh against the environmental benefit when it comes to biogas?

I have a tendency with manure systems to run into this environmental and economic intersection. People are trying to run farms. They need to make a profit. How do we find things that may be advantageous economically *and* environmentally? That's the jackpot, right? To hit something that's very clear that you can make money *and* it's better for the environment. For me, digesters are a great way to mitigate climate change, which is something that makes me very nervous as someone who has seen projections of what that might mean for us. Although energy systems are the biggest leader for the gasses that contribute to climate change, agriculture is a big 10 percent chunk of that, give or take. In livestock systems, we really need to look at the ways that we can mitigate the contributions to climate change.

What happens when the solutions that are better for the environment aren't more cost effective?

We try to look at what price we are giving the cost we're going to pay later when these emissions cause havoc. With climate change now, I'm hoping that people are realizing that we're at the point of needing to make decisions. We need to be assigning value and dollars to what the impacts of these decisions are and trying to pick the decisions that can be most cost effective for us to make change.

What are you most excited about for the new semester?

So many things! I like having the students back. We research and we do things in the summer, but the real swing of the university, the energy of it, comes back in the fall. It just provides a positive charge to everything you're doing. I'm excited to have a new office and a new location; that feels very different than the past 12 years. And of course, a day out at the Terrace is never a bad thing — and I'll be close to that in my office!

What classes will you be teaching this year?

I am only teaching the Women in Science and Engineering class this fall. I am the codirector of the [program]. I think we have 120 or 130 students. It's really been a great thing. They're very bright. It's amazing to see students these days. In the spring, I will teach Environmental Studies 126: Principles of Environmental Science. That's one thing that I'm excited about, but there's still a lot of work to be done. It'll be my first year teaching [that class]. I typically used to teach a 400-level course, so I didn't see a lot of younger students. I'm excited to get that first- and second-year perspective. You're seeing students at a different stage where they haven't figured everything out yet. Everyone is trying to figure things out, there's lots of adventures to be had, and it's fun to be a part of that.

Rebecca Larson and Kenny Janisch, UW animal research technician, enjoy the view in front of Arlington Agricultural Research Station's manure lagoon. Photo credit: Ben Vincent/UW-Madison CALS

Notaro Teaches AOS 100 Class

Center for Climatic Research Director Michael Notaro teaches first atmospheric and oceanic science class for the Summer Collegiate Experience program.

By Anica Graney

It was a summer of firsts for Nelson Institute Center for Climatic Research director and scientist Michael Notaro and the University of Wisconsin–Madison's Summer Collegiate Experience (SCE) program. Wanting to expand into weather and climate science, the SCE program added Atmospheric and Oceanic Sciences (AOS) 100: Weather and Climate to its curriculum, which Notaro was offered the opportunity to teach for the first time.

The Summer Collegiate Experience.

The SCE program is a six-week, on-campus program for incoming first-generation college attending-students, largely from underrepresented populations. The curriculum is designed to advance students' skills in writing, critical thinking, and cultural awareness while they adjust to the university's academic and social environment.

Twenty-two SCE students signed up for AOS 100 where they learned about meteorology, climatology, and Earth's changing climate. Classes were two hours a day, Monday through Thursday.

In addition to lectures, AOS 100 offered students many hands-on learning opportunities and explorations into a variety of physical science careers. "I think that really helped to draw their interest," Notaro said. "They all came from different backgrounds, so I wanted to be able to reach them and make it locally interesting to them."

Students went on a Lake Mendota boat trip, toured the Cave of the Mounds, watched videos on the 3D globe in the AOSS building, drove a terra rover around Camp Randall, and played games such as jeopardy and station-based activities that taught about the water cycle. Students rounded out the experience through visits with UW physical science faculty.

> ***"For many years, both women and minority students have felt they're not welcome in the STEM fields. I want to see change."***
>
> — Michael Notaro

Through AOS 100, Notaro fulfilled his long-time goal of teaching a class at UW and appreciated the opportunity to work with underrepresented students. "I wanted to show the students that these sciences can be interesting and that they can pursue degrees that may have seemed difficult before," Notaro said.

He pointed to a study published in *Nature Geoscience* that shows how there has been no progress on racial and gender diversity in earth, atmospheric, and ocean sciences in the last 40 years. "When I see that, it's really depressing to me," Notaro said. "For many years, both women and minority students have felt they're not welcome in the STEM fields, and I don't want that to continue. I want to see change."

Along with teaching, Notaro has been working to bridge the diversity gap and encourage students to explore careers in physical sciences through projects funded by a National Science Foundation grant that has so far offered internship opportunities to Beloit Memorial High School students at the Welty Environmental Center and a STEM summer camp for autistic students.

Making Freight Sustainable

Nelson Institute undergraduate Zebulon Grove sees sustainable future for supply chains.

Grove's group from NOLS course during a sea kayaking expedition. Photo credit: Evan Bodfield

By Rachel Carrier

Nelson Institute undergraduate student Zebulon Grove sees a hopeful future for sustainability in business practices. From his time spent working at a major freight company, volunteering on a demonstration farm, and even navigating the Alaskan waters by kayak for a month, Grove has found his passion in emphasizing sustainability in major business practices for his future.

Grove's path to discovering his career aspirations, like most students, was not linear. He came to UW–Madison with the intention of being a mechanical engineer designing sports cars. When realizing it was not for him, Grove applied to the Wisconsin School of Business in the spring of his freshman year. Waiting for his admissions decision over the summer, he took a month-long Knolls course in Alaska where he completed 14 days of backpacking and 14 days of sea kayaking. The group of 12 students were completely unplugged, without phones or electronics, connecting with and learning about the environment.

"I knew exactly what I wanted to do. I wanted to protect the environment I care so much about."

— Zebulon Grove

"I went into this summer so scared," Grove said. "But I had the most amazing time of my life."

Grove returned from his trip to see that he was denied admission to the business school.

"I had a brief moment of 'what am I going to do?'" Grove recalled. "But then I realized, I just did this month-long program in nature and had enough experience to back my interests. I knew exactly what I wanted to do. I wanted to protect the environment I care so much about."

Following that moment, Grove began thinking of ways he could incorporate his business interests with environmental

studies. He settled on pairing the major with economics, and thus began a new chapter in Grove's academic journey.

The first class Grove took with the Nelson Institute was the Economics of Climate Change taught by emeritus professor Bradford Barham. Grove was drawn to his eloquent delivery of lectures and dedication to students, so much so that Grove intentionally took another class taught by Barham outside of the Nelson Institute, Latin American Economic Development.

"Having a professor like him as my first exposure to the Nelson Institute was amazing and solidified that I was where I was supposed to be."

Grove is now entering his final semester at University of Wisconsin–Madison, where he'll graduate with a double major in environmental studies and economics with a certificate in developmental economics. His learning and experience in both fields extend far beyond the classroom.

For the past two summers, Grove has worked at Old Dominion, a competitor to shipping companies like FedEx and UPS, shipping freight across the United States, Canada, and Mexico. As an operations intern, Grove manages the efficiency and logistics of their shipping terminal. During the school year he assists as a forklift driver, among other responsibilities with the company. After graduation, Grove hopes to expand his role within the company into managing a larger area.

These roles have opened his eyes to a flaw in the way freight is managed; it is largely not sustainable.

Semis and cars standing still during a traffic jam. Photo credit: Andriy Blokhin

"I think that will really come down to efficiency," Grove said. "If you can move freight without having as much road time, the driver will have to use less fossil fuels. It's problems like this that draw me to the idea of making supply chains more sustainable."

Grove sees a gap in the trucking industry when it comes to focusing on sustainability. When it comes to finding efficient and sustainable solutions in the transportation sector, he sees an opportunity to explore beyond the "standard solution" of electric and self-driving trucks.

"The transportation industry is one of the largest carbon emitting industries out there." Grove said. "I think there are practical ways to solve that issue while staying profitable, and I want to play a part in finding that solution."

Having a passion for sustainability came from a number of Grove's experiences. Last fall, Grove worked for the Savanna Institute — led by fellow Nelson graduate Keefe Keeley — on a demonstration farm in Spring Grove, Wisconsin. The nearly 500-acre farm researches and implements sustainable alternatives to monocropping, planting a field of only one crop, and ally cropping, planting rows of trees for crops to grow between. His role focused on managing and preparing for their current summer initiative of planting hazelnuts, chestnuts, sassafras, corn, and soybean.

Grove described the farm to be an "all-encompassing ecosystem, with orchards and organic corn and soybean crops, forests, and newly added livestock". There, Grove worked to manage the species found on the farm. Holding a variety of tasks, Grove was focused on identifying and mitigating invasive species, determining what trees needed to be removed, clearing land for the incoming livestock, tree identification, planting of cover crops such as wheat and rye, and shadowed the breeding of tree species. His time with the Savanna Institute helped to emphasize the importance of giving back to the planet and sustaining nature.

As he wraps up his final classes before going into the workforce, Grove reflected on the impact he hopes to make in the future.

"I think that it's really important that businesses start to implement sustainability initiatives, and I want to be at the forefront of that in an industry that has not really taken sustainability into account."

Learn more about the environmental studies major and how you can support the program.

EC and EOI Cohorts Finish 15-Month Programs

Meet some of the newest graduates of the Environmental Conservation and Environmental Observation and Informatics programs.

By Anica Graney

"I can't express it enough: it's such a great program."
— Grace Cheptoo

As summer comes to a close, so does the 2021–22 environmental conservation (EC) and environmental observation and informatics (EOI) cohorts.

The 29 graduates rounded out their master's of science degrees with exit seminars held in late July and early August that focused on their unique professional projects followed by group Q & A sessions. Seminars ranged in topics from environmental government policy to equitable sustainability practices to mapping tree species in midwestern forests.

"A strength of the environmental professional programs is the final project experience where each student works directly with a conservation organization," said Sarah Graves, EOI program coordinator. "I love these exit seminars because the students share why their individual work supports conservation efforts and their professional goals. It is very rewarding to see how students apply their learning and develop professionally."

Learn more about four of the graduate students by visiting each of their student features.

Grace Cheptoo Preserves Wildlife at Home in Kenya

Graduate student Grace Cheptoo moved across the world to begin the environmental observation and informatics program at the Nelson Institute in May of 2021. Her journey to the Nelson Institute, though, was nothing short of a "wild" ride. "The program is incredibly well packaged and I'm so grateful for the opportunity to participate in it," Cheptoo said. "I can't express it enough, it's such a great program and a great fit for me." Read more.

From the Peach State to the Badger State, Kevin Ronckowski Monitors and Preserves Wetlands

Environmental observation and informatics graduate student Kevin Ronczkowski has always been a Badger fan. Cheering from his home state of Georgia, Ronczkowski jumped at the opportunity to continue his education at the University of Wisconsin–Madison. "My family is from the Wisconsin area," Ronczkowski said. "I grew up a Badger fan and always wanted to go to school here." After completing his undergraduate degree in parks, recreation and tourism management at the University of Georgia, Ronczkowski found the EOI program and moved to Madison two weeks after graduating. Read more.

Carrie Lovelace Aspires to a Role in Conservation Planning Despite Facing Adversity

Nelson Institute environmental conservation master's student Carrie Lovelace has persevered through some of life's toughest challenges while completing her degree. After beginning the program in summer 2020, Lovelace was diagnosed with Hodgkin's lymphoma, a form of cancer that affects the lymphatic system. Despite taking time off from the program to manage her health, Lovelace's passion for protecting the environment remains unwavering. "Part of why I like this program so much is because it opened up a lot of doors for me and I can choose where I want to go from here in a much broader sense because of what this program has taught me," Lovelace said. "I'm very open to where my future takes me." Read more.

Mary Kate McCoy Hopes to Create Change Through a Career in Policy

Starting her career by writing about environmental issues, Mary Kate McCoy found herself wanting to do more to support conservation efforts. "Personally, I had reached a point where I wanted to work more directly with finding solutions to the problems instead of just writing about them all the time," McCoy said. McCoy's drive for implementing change turned her to the Nelson Institute's environmental conservation program, a 15-month degree that teaches students how to apply practical interdisciplinary skillsets to a broad range of careers in conservation. "It felt like a really good way to meld my interest in the environment with my love and experience with storytelling," McCoy said. "I had the communications background and was looking for more of a science background." Read more.

With 15 months of interdisciplinary course work under their belts, the graduates will enter the world ready to make change in their prospective fields. With pressing environmental challenges becoming increasingly prevalent, taking action and providing perspective is crucial to developing a better tomorrow.

"If any prospective students are curious about what they can do with this degree, I encourage them to read some of the stories of individual students and to contact us! We are happy to discuss your interests and professional goals and how they could be supported in our programs," Graves said.

Learn how to be the difference and apply to the EC and EOI programs. Applications for summer 2023 are now open.

Heat Wave Warriors

Two Nelson PhD candidates are working to keep Wisconsin communities safe from heat waves.

Elizabeth Berg

Becky Rose

By Abigail Becker, UniverCity Alliance

As dangerous heat levels are breaking records across the United States and globe, three University of Wisconsin–Madison graduate students are collecting data to inform a heat warning system based on health outcomes — a tool they hope could eventually save lives.

Nelson Institute environment and resources PhD students Elizabeth Berg and Becky Rose and public health and public affairs master's degree student Sara Pabich are tracking extreme heat events in six cities, including Madison and Milwaukee.

They're working with climatologist Larry Kalkstein as a part of the Wisconsin Heat Health Network, which is supported by UniverCity Alliance (UCA) and collaborators that include the City of Madison, Milwaukee County, City of Milwaukee, and Dane County. Their research will inform a warning system in Madison and Milwaukee based on health outcomes that considers mortality and weather data rather than only meteorology.

"People's response to heat is more important than the intensity of the heat itself. We are trying to determine when people are most sensitive to heat waves," said Kalkstein, who is the president of Applied Climatologists, Inc. and chief heat science advisor for the Adrienne Arsht-Rockefeller Foundation Resilience Center. "Health practitioners want to know when people are most vulnerable to heat related illnesses and deaths."

The stakes are high. According to a 2021 report from the Wisconsin Initiative on Climate Change Impacts, the number of days that will exceed 90 degrees in Wisconsin is expected to triple by mid-century. Extreme heat already causes more fatalities than any other weather-related event in the state and the country.

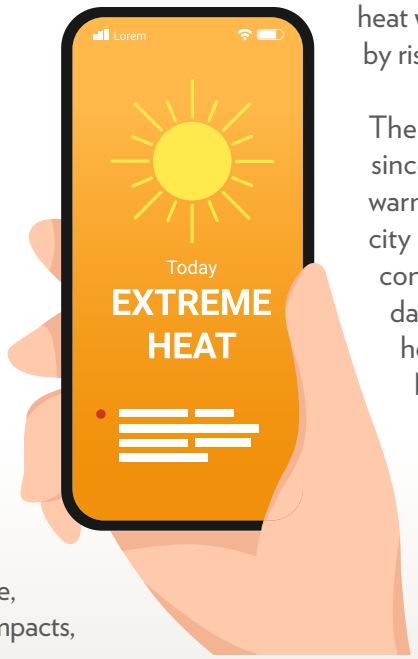
"The most direct hopeful outcome will be saving people's lives during these heat events that will become more and more frequent and severe," said Rose, who is advised by Nelson Institute associate professors Aslıgül Göçmen and Annemarie Schneider.

In practice, the new warning system could help policymakers make decisions for how their population can stay healthy during extreme heat. This could include neighbors deciding to check in on an elderly resident and a city opening more cooling centers throughout a community affected by extreme heat.

Berg works in the Department of Agronomy and Nelson Institute Center for Sustainability and the Global Environment (SAGE) affiliate, Chris Kucharik's lab. She has been working with Kalkstein for over two years and said it's important for leaders to consider the locations and demographics of those who are being affected disproportionately by the heat.

In Milwaukee, Berg is analyzing more specific health data by zip code instead of the entire city.

"We've already known that extreme heat doesn't impact everyone equally," said Berg, noting that factors like housing and socioeconomic status are contributing factors. "I'd love for this to be a starting point for not just increasing communication about heat, but to make it easier for cities to target interventions specifically where they're needed."



Madison and Milwaukee became involved in 2020 when UCA managing director Gavin Luter organized a group of interested stakeholders to have an initial networking meeting about heat and health. This group included Dane County, the City of Madison, the Sustainable Madison Committee, the Wisconsin Initiative on Climate Change Impacts, and UW–Madison's Global Health Institute.

Eventually, the group became the Heat Health Network and expanded to include representatives from the Wisconsin Department of Health Services, Milwaukee County's Office of Emergency Management, the City of Milwaukee Sustainability Office, the Milwaukee Metropolitan Sewerage District, UW–Madison's agronomy department, a University of Minnesota–Twin Cities graduate student, and Public Health Madison & Dane County.

"I'd love for this to be a starting point for not just increasing communication about heat, but to make it easier for cities to target interventions specifically where they're needed."

— Elizabeth Berg

Pilot program at work

These collaborators are coordinating with the National Weather Service's Sullivan office this summer to evaluate the pilot program. They hope the lessons learned in Madison and Milwaukee will support exploring the feasibility of expanding the heat health warning system around the state.

"The whole purpose of this at the end of the summer is to compare all of the data to see how closely it follows the National Weather Service's heat advisories," Pabich said. "We want this system to be effective and replicable to other at-risk areas in the state. Essentially, we want it to align with the National Weather Service but also add the human mortality rate component."

Kalkstein's algorithm factors in historical health data, historical air mass types and frequency of each type, and calculated heat wave intensity, to produce one of three heat wave categories that increase numerically by risk.

The data collection site has been running since mid-May and has been adjusted to warn stakeholders and meteorologists when a city is in the top 5 percent of excessive heat conditions. The student researchers track the data daily, comparing how the algorithm's heat warnings align with warnings from the National Weather Service.

This work is financially supported through the Climate-Ready States and Cities Initiative through the Centers for Disease Control that was secured by Dane County's Department of Health Services. The Adrienne Arsht-Rockefeller

Foundation Resilience Center, which aims to build individual and community climate resilience in the wake of climate change, is funding separate but related work to implement a heat ranking system. Other cities currently being studied include Los Angeles; Miami; Kansas City, Missouri; Seville, Spain; and Athens, Greece.

This summer marked a milestone for Seville, which became the first city in the world to implement the ranking program. The city also named its first heat wave *Zoe*.

"I'm just glad to have a system that is based on health outcomes and not strictly on meteorology," Kalkstein said. "It's very important to have that because most of the stakeholders respond to emergency room visits, mortality — all of these things that are really important when it comes to heat waves."

Cities across the nation and world are taking notice. Kalkstein said he's fielded inquiries from New Orleans, South Korea, and Brazil and "wouldn't be surprised" if about a dozen more cities joined next year.

What's next?

In Madison and Milwaukee, the next step is to evaluate.

Kalkstein said a summer's worth of data will inform if the algorithm should be adjusted. He also suggested forming a heat taskforce to discuss and coordinate what policies the cities are implementing when a heat warning is called.

This is important because if the ranking system is implemented, municipalities would need to make sure residents understand it and what resources they can use to stay cool, safe, and healthy.

After observing the data for about two months, Berg said she can confirm that extreme heat is more dangerous in areas with more temperate and less consistently warm climates, like Madison.

"As we've been doing the tracking, the two cities that really haven't had any dangerous heat events yet are Miami and Los Angeles," Berg said. "In the U.S., it's been the places that have much more seasonal variation where we have met those metrics for dangerous heat waves."

Downtown Madison, Wis. Photo credit: Jeff Miller/UW-Madison

Pabich, who is also a climate data assistant with Dane County, is looking forward to discussing the public education component of implementing a new ranking system.

"I really love the public health angle of combining how the environment affects public health and what we are doing both at the county level and then what the Wisconsin Department of Health Services is eventually going to do with this information," she said.

Rose said she hopes the Wisconsin Heat Health Network's work will result in meaningful policy changes not only like opening cooling centers, but implementing protections for workers whose jobs keep them outside.

"Everything is connected," Rose said. "Health is a part of the picture, but it's also tightly bound with economic wellbeing and social well-being."

Introducing: The Jim Miller Graduate Scholarship

A new scholarship has been established for excellence in Water Resources Management.

Jim Miller. Photo credit: Kevin Berger

By Chelsea Rademacher

"Water is fundamental to all life," states the leading sentence on the Nelson Institute for Environmental Studies' water resources management (WRM) program website. It's a short and simple sentence, but one whose importance cannot be overstated. And since 1965, the program has been training graduate students to steward this critical lifeforce in careers across the globe. Today, graduate students in the WRM program have a new scholarship opportunity to bolster their studies: the Jim Miller Graduate Scholarship for Excellence in Water Resources Management. The new scholarship is generously funded by Linda Graham, UW professor emerita and former program chair of the WRM program.

Graham joined the UW faculty in 1976 as a professor in the Department of Botany. She literally wrote the book on algae; her research interests include the evolutionary origin of land plants, metagenomics-based microbiomes of algae and plants, and freshwater periphyton ecology. She held several chair positions during her tenure on campus, including the botany department, the Limnology and Marine Sciences graduate program, and the WRM program, which she led from 2004–07. "In those [roles], I learned of the great need for scholarship money. I also learned that the WRM students are just extraordinarily good. They're as good as any graduate students in the university," Graham says. "They could go to other programs or go out to jobs that commanded huge amounts of money, and here they are — preparing to serve the public."

> ***"When people named scholarships, they usually picked some really famous professor. I thought it was time for the staff to have some honors."***
>
> — Linda Graham

When it came to naming the scholarship, Graham chose to honor someone who has become practically synonymous with the Nelson Institute's graduate programs: Jim Miller. For the past 24 years, Miller has been a guiding light for Nelson's grad students, providing exceptional, dedicated service to both students and faculty advisors alike in his role as graduate program manager. In addition to providing an annual scholarship opportunity for remarkable students, the Jim Miller Graduate Scholarship for Excellence in Water Resources Management also recognizes Miller's outstanding efforts and legacy with the Nelson Institute.

"I had noticed over the years that when people named scholarships, they usually picked some really famous professor, and I thought it was time for the staff to have some honors," Graham says of

Linda Graham

Anita Thompson

naming the scholarship. "Jim just comes to mind at every turn."

Anita Thompson, the current WRM program chair, couldn't agree more. "This is a fantastic and well-deserved way to honor Jim's dedication and contributions to the WRM program and its students," Thompson says. "We are so grateful to Linda for this generous gift and for her past and continued support of the WRM program."

The WRM program is near and dear to Miller's heart. "I've had an affinity toward the WRM program since I started working with the Institute back in September 1998," Miller says. An avid fisherman, he feels personally connected to the work the program is doing to protect this vital resource.

Miller also notes that the WRM program is perhaps Nelson's best representation of the Wisconsin Idea, and Graham agrees. "What these students do is take this incredible collection of brilliant basic and applied research that the rest of us do on water at UW–Madison, and they translate it into real-world solutions. That's what the program does," Graham says, "It trains students to be public servants of the very highest quality."

"I'm extremely flattered to be honored and recognized in this way by former Water Resources Management program chairperson and professor emeritus Linda Graham," Miller says. "This is such a neat gift and gesture from Linda for WRM. It will be a tremendous opportunity for us to recognize the outstanding scholarship and contributions of a full-time student on an annual basis. I can't thank Linda enough."

TO SUPPORT

Everybody is welcome to support the remarkable students in the Water Resources Management, and to celebrate Jim Miller's legacy, by contributing to the scholarship. Gifts in any amount are needed and appreciated! Learn more, or contact Ann Swenson, associate dean for advancement, or Dan Fallon, senior director of development, with questions.

Support NELSON

Interested in supporting the Nelson Institute? There are many ways to contribute to the Nelson Institute — participating in our events, mentoring our students, providing connections to your personal networks, and making financial gifts. All of these are necessary and important to us, and we invite you to invest in our community in the way that makes the most sense to you. Learn more about all of the great academic programs, research centers, and public programs we offer.

Gifts in any amount are needed and appreciated!

Professorships, Chairs, and Faculty Fellows

Get to know the Nelson Institute's 2022–23 honorary positions.

The Nelson Institute is fortunate to have a number of professorships, chairs, and faculty fellowships that have been established by generous philanthropic gifts. We are pleased to announce that the following individuals will hold these honorary positions during the 2022–23 academic year.

New Named Professorships and Chairs

A **Will Brockliss**
Bradshaw Knight Professor of the Environmental Humanities
Associate Professor, Department of Classical and Ancient Near Eastern Studies
Director, Nelson Institute Center for Culture, History and Environment

B **Tracey Holloway**
Inaugural Jeff Rudd and Jeanne Bissell Professor of Energy Analysis and Policy
Professor, Nelson Institute for Environmental Studies and Department of Atmospheric and Oceanic Sciences
Program Chair, Nelson Institute Energy Analysis and Policy Program

Continuing Professorships, Chairs, and Faculty Fellows

C **Andrea Hicks**
Hanson Family Fellow in Sustainability
Associate Professor, Department of Civil and Environmental Engineering
Director of Sustainability Education and Research, Office of Sustainability

D **Jonathan Patz**
John P. Holton Chair in Heath and the Environment
Professor, Nelson Institute for Environmental Studies and School of Medicine and Public Health

E **Paul Robbins**
Nelson-Hanson Chair in Environmental Studies
Professor, Nelson Institute for Environmental Studies and Department of Geography
Dean, Nelson Institute for Environmental Studies

F **Anita Thompson**
Ken Potter Professor of Water Resources (formerly known as the Nelson Institute Professorship in Water Resources)
Professor, Department of Biological Systems Engineering
Program Chair, Nelson Institute Water Resources Management Program

G **Monica White**
Gaylord Nelson Distinguished Chair in Integrated Environmental Studies
Associate Professor of Environmental Justice, Nelson Institute for Environmental Studies and Department of Community and Environmental Sociology
Inaugural Director, Nelson Institute Office of Environmental Justice

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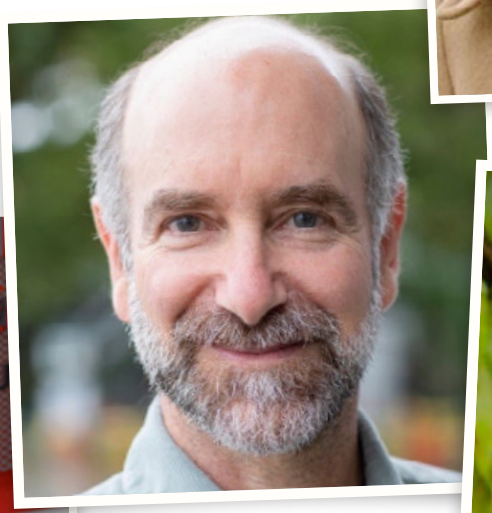
B



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Weston Series

The Weston Roundtable Series is designed to promote a robust understanding of sustainability science, engineering, and policy through weekly lectures co-sponsored by the Center for Sustainability and the Global Environment (SAGE), the Department of Civil and Environmental Engineering, and the Office of Sustainability. Lectures take place from 4:15–5:15 p.m. every Thursday at 1163 Mechanical Engineering Building, starting on September 15.

Featured Roundtable:
Clear Cut: Burning Forests for Energy Doesn't Stack Up
Bob Musil, President and CEO, Rachel Carson Council
Thursday, Oct. 6

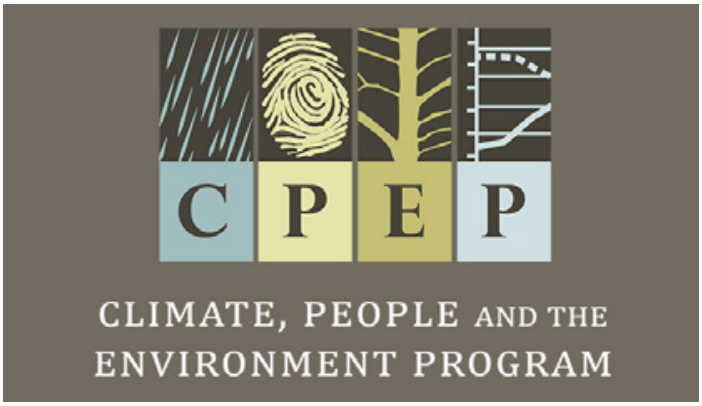
Learn more about this lecture and others in the series.

Fall 2022 CHE Environmental Colloquia

The Center for Culture, History, and Environment (CHE) invites you to attend the Fall 2022 CHE Environmental Colloquia series on Wednesdays from 12–1 p.m. in 140 Science Hall.

Capitalism and Industrialism
Alexander Dunlap, Postdoctoral Research Fellow, University of Oslo
Wednesday, Oct. 26

Hurricanes Amidst the Great Depression: Agrarian Reform and Reconstruction in Puerto Rico, 1928-1940
Adrian Bermudez Perez, UW Master's Degree Student, Latin American, Caribbean, and Iberian Studies; Graduate Associate, Center for Culture, History and Environment
Wednesday, Nov. 16



CPEP Series

Each semester the Climate, People, and the Environment Program (CPEP) hosts a weekly seminar featuring lectures by visiting speakers as well as presentations by CPEP faculty, scientists, and students. CPEP seminars take place from 4–5 p.m. on Tuesdays at 811 Atmospheric, Oceanic, and Space Sciences Building, starting September 27. The presentations are held in conjunction with the Department of Atmospheric and Oceanic Sciences and are open to the public.

Featured Seminar:
Fostering Neurodiversity in Support of Effective STEM Learning
Michael Notaro, Director, Nelson Institute Center for Climatic Research
Tuesday, Sept. 27

Learn more about this lecture and others in the series. Past lecture recordings are available for viewing.

Viral Markets: Economics, the Environment, and Emerging Disease in the Twentieth Century
Richard Keller, UW Professor of History and Medical History
Wednesday, Dec. 14

Tales from Planet Earth: *Hearts of Glass*

Tuesday, Sept. 27 6:30–8:30 p.m.
at the Waisman Center

Join the College of Agricultural and Life Sciences, the Nelson Institute, and the Waisman Center for a screening of Hearts of Glass followed by a Q & A session. Hearts of Glass is a documentary that follows the tumultuous first 15 months of operation of Vertical Harvest of Jackson, Wyoming, a state-of-the-art hydroponic greenhouse that provides meaningful inclusive employment for people with disabilities. Register for the event, or learn about virtual screening options.

KEEP UP TO DATE ABOUT UPCOMING ENVIRONMENTAL EVENTS

Nelson Video Library

If you missed a Nelson Institute hosted event or lecture, you can view recordings on demand in our video library.

LEVELING UP

TIPS + ASSISTS FOR YOUR POST-COLLEGE GAME PLAN

nelson.wisc.edu/leveling-up

Join us

in celebrating the Nelson Institute year-round by purchasing branded merchandise, shirts, sweatshirts, jackets, bags, and more!