Nelson Institute for Environmental Studies
UNIVERSITY OF WISCONSIN–MADISON

October 2024

THE COMMONS

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

Frightful Forecast

Halloween temperatures in Madison reveal a spooky trend.

175 years of energy research.
Page 4

A walk to remember.
Page 10

Four things you didn't know about land tenure.
Page 18

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We're reducing our carbon footprint! We hope you enjoy our digitally published magazine, sent monthly to Nelson alumni, students, and friends.

Cover: Pumpkin picking on Bascom Hill, ca. 1982. Photo courtesy of UW Archives / Smith, Gary E.

INSIDE

From the Dean

Greetings, Nelson alumni and friends,

2024 is roaring along, and we've been flying through events, improvements, and innovations at a hummingbird's nervous pace. So, I'll get right to it. To close out September, we celebrated the legacy and future of the Nelson Institute with two of our signature events: Tales from Planet Earth and Rendezvous on the Terrace. I enjoyed catching up with Professor Emeritus Cal DeWitt, who took us on a journey through the Waubesa Wetlands for our first Tales screening of the semester. Rendezvous, as always, was a night of celebration as we honored our 2024 alumni award recipients, recognized our soon-to-be retired Professor Paul Zedler, and saluted *you*, our alumni community.

We wouldn't have alumni if we didn't have students; in fact, our students are our raison d'être. this makes improving student experience our highest current priority. We have new internship programs, expanded course and certificate offerings, more scholarship support, and several new events and professional development opportunities (which we call: "Leveling Up"!). The big news on that front is the rollout of at least six and perhaps as many as eight new faculty hires, all part of the EARTH: RISE initiative but also long planned) in areas including land use, environmental justice, renewable energy, infrastructure impacts, environmental health, law and policy. Going forward, there will be more courses, more career paths, more mentors and advisors, and more ideas, all focused on facing complex environmental and sustainability challenges. This represents a lot of change and opportunity.

On the research and innovation front, we just got word of two grants in hugely innovative areas. On the health side of environmental impacts, the esteemed Jonathan Patz and his colleagues just brought in a $3.8 million grant to establish the nation's first Health-First Climate Action Research Center. On the conservation front, geneticist Francisco Pelegri, data scientist Kyle Cranmer and I will be working together alongside a top-notch, interdisciplinary team of philosophers, conservation scientists, and data experts to explore the ethical and technical issues surrounding the frontier field of conservation genetics, all rooted in principles of Indigenous Data Sovereignty. Watch for more in-depth stories about these projects, coming soon.

It's been a whirlwind start to the semester, and we're just getting started. Coming up next week, the Office of Sustainability is hosting the third annual Sustainability Symposium, which will look at the intersections of AI and sustainability. Then, from October 24–25, I hope you'll consider joining in the Fill the Hill festivities. Your support is what drives the progress you've just read about — as well as the impressive work you'll learn about in the following pages. These two events are taking place during UW Homecoming week, so if you're planning to be back on campus, I hope you'll add them to your itinerary. And, if you do find yourself reminiscing on the steps of Science Hall, please drop in and say hello. I'm almost always here!

On, Wisconsin!

Paul Robbins
Dean, Nelson Institute

Inside the EPA

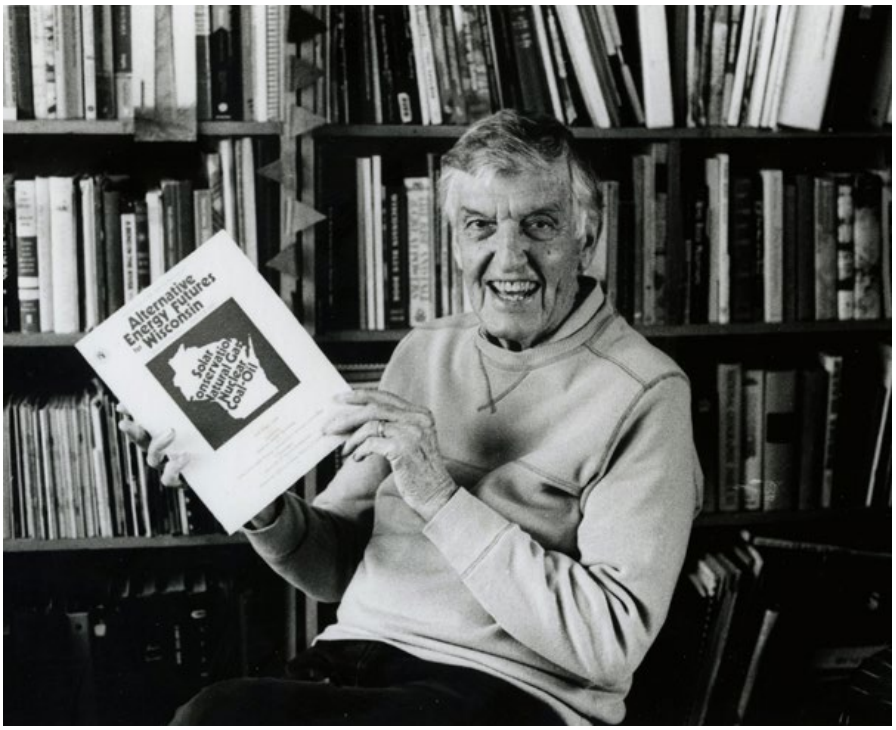
On Monday, Sept. 16, the U.S. Environmental Protection Agency (EPA)'s chief of staff, Dan Utech, visited the UW–Madison campus. After a tour of the Allen Centennial Gardens and D.C. Smith Greenhouses, a podcast taping with *SustainUW*, and a class visit, Utech sat down with Dean Paul Robbins to discuss the EPA's ongoing efforts to combat climate change and other environmental challenges.

Feature

175 Years of Energy Research at UW–Madison

From minerals to sunlight, the quest to find, harness, and improve energy has helped shape the university's research portfolio.

By Chris Hubbuch, Wisconsin Energy Institute



Left: Professor emeritus Wes Foell pictured in his Madison home in 2024 with a copy of his 1978 report on Wisconsin energy use and policy. Foell's collaborations laid the groundwork for the Energy Analysis and Policy program, which was launched in 1980. Photo by Jacqueline Wisinski / Wisconsin Energy Institute; Right: Tracey Holloway and EAP students on a field trip to Milwaukee in 2022. Photo by Tracey Holloway

Energy-related research at the University of Wisconsin–Madison evolved over the institution's first 175 years, from departmentally-segregated work focused largely on technological innovation to a more holistic and interdisciplinary approach that bridges technologies, environmental and social impacts, and policy.

Not long after installing the first electric lights on campus, UW–Madison had one of the nation's top electrical engineering programs, and in the years after the second World War, the university became known for work on nuclear engineering, solar energy, and internal combustion engines.

Coinciding with the energy crisis of the 1970s, there was a new push to think more comprehensively about energy, which spawned the energy analysis and policy program, though the focus remained primarily on supply.

Later, recognition of an impending climate crisis ushered in a new era of cross-disciplinary thinking in the 21st century, with cluster hires that included researchers who together brought engineering, environmental, and policy perspectives as well as the formation of collaborations like Wisconsin Energy Institute and the Great Lakes Bioenergy Research Center.

"We are sitting on a cornucopia of energy excellence," said Tracey Holloway, Nelson Institute professor of environmental studies and director of the energy analysis and policy program.

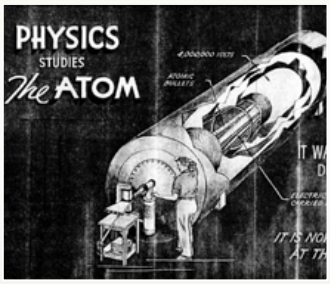
While the university has produced thousands of papers and patents that influence policy and undergird technologies, many of those discoveries are often in the weeds.

"It's not like there's some major piece of handheld technology that people can associate with our department here, like an iPhone or something like that," Wilson said.

Perhaps the biggest single contribution is the alumni, including many serving as leaders of local, state, and national government agencies as well as private industry.

"Our main product is the student," said Greg Nellis, director of the Solar Energy Lab. "I think that's going to be our continuing legacy."

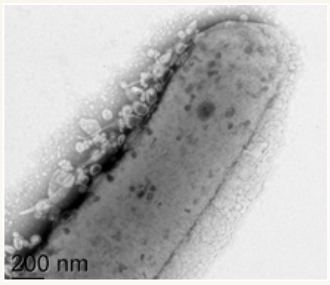
The university, in partnership with Alliant Energy, is developing a 2.25-megawatt solar and agricultural research pilot project at the Kegonsa Research Campus near Stoughton to study agrivoltaics – the coproduction of plants and solar energy. Photo by Althea Dotzour / UW–Madison



Take a comprehensive look at the history of – and ongoing excellence in – energy research at UW–Madison. This five-part story was researched, reported, and published by the Wisconsin Energy Institute.

Part 1: Energy Underpinnings
Even in the days before energy was a topic of research interest, the quest to power an industrialized economy guided the university's mission.

Part 2: The Atomic Age
From the Manhattan Project to fusion energy, UW–Madison scientists have been at the forefront of nuclear science and engineering.



Part 3: Connecting Dots and Breaking Down Silos
Starting in the 1970s, UW–Madison researchers began thinking more holistically about energy and the connections between supply, pollution, and policy.

Part 4: Bioenergy
UW–Madison scientists look to the tiniest lifeforms to solve some of the world's largest problems: namely, producing sustainable plant-based alternatives to fossil fuels and petrochemicals.

Part 5: Power to the People
For all the thousands of discoveries and patents UW–Madison has produced, perhaps the biggest contribution to energy research is the graduates who continue to push the field forward.

(Don't Fear) the Weather

Halloween temperatures in Madison show a shockingly bone-chilling trend.

By Chelsea Rademacher

Students pick pumpkins from Bascom Hill. Bascom Hall is in the background, ca. 1982. Photo courtesy of UW Archives / Smith, Gary E.

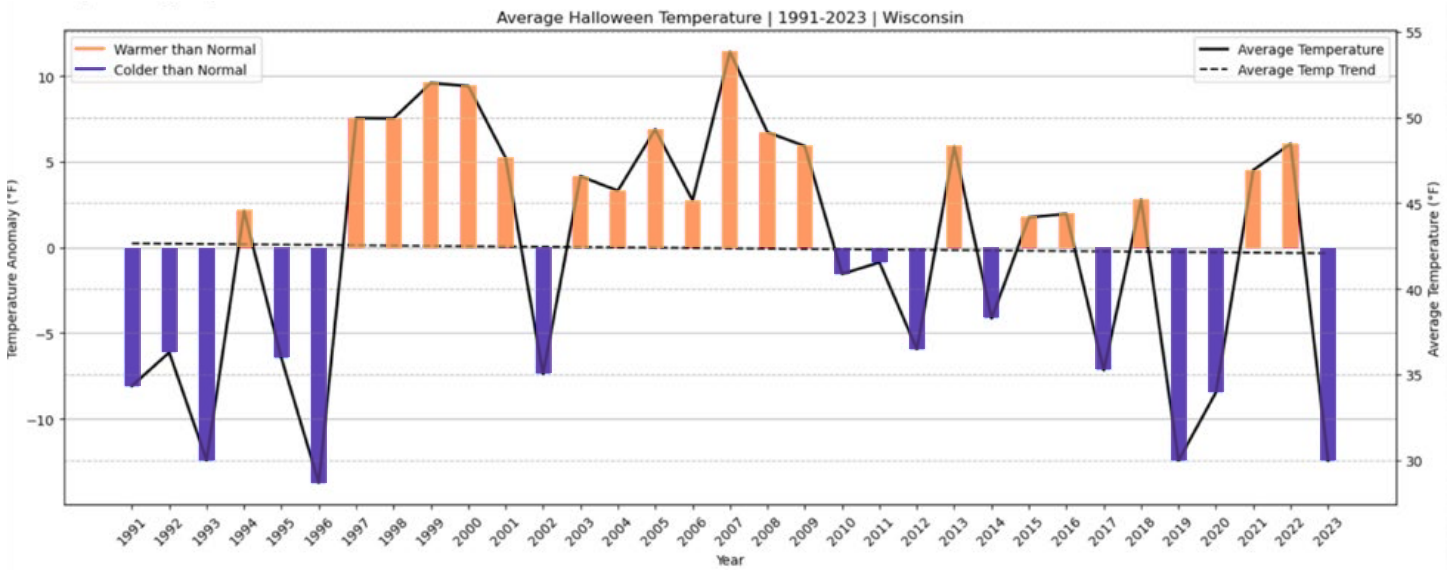
Remember when you were a kid, and Halloween was *so cold*? We're talking full-snowsuit-under-the-costume cold. So cold that your fingers burned as you sorted and swapped sweets. Today's trick-or-treaters have it *way* easier, right? Halloweens these days are downright balmy compared to the fright nights of your youth.

That may be the collective memory, but it's actually … totally wrong. Weather data from the Wisconsin State Climatology Office shows a trend that will send chills up your spine: Halloween — at least in the Madison area — has gotten colder.

"Much to our surprise, there is a cooling trend in Halloween's temperature," says assistant state climatologist Bridgette Mason. "Honestly, we really don't have much of an explanation as we expected an increase in temperature!" Mason, alongside fellow assistant state climatologist Ed Hopkins and state climatologist Steve Vavrus, analyzed weather data from 1991 to 2023 in both Madison and across the state. While the statewide data shows a cooling trend of 0.6 degrees Fahrenheit, Madison's Halloweens have cooled by 2.7 degrees.

On Halloween in 1991 — when the most popular costume was Arnold Schwarzenegger's the Terminator — Madison reached a daytime high of 49 degrees . But last year, when Barbies and Spider-Men and Wednesday Addamses rang your doorbells, Madison only reached a high of 36 degrees. While there hasn't been a significant change in the daily high temperatures from 1991 to 2023, the lows, and consequently the averages, have dropped by about 3 degrees.

That said, the stats for "warmer than normal" and "colder than normal" years have kind of been all over the place. A warmer-than-normal stretch ran from 1997 to 2001, and 2019 plummeted to more than 15 degrees colder than average in Madison. With the daytime high barely scraping above freezing, it was an appropriate year for Annas and Elsas to hit the pavement. "There have been many more far-from-normal years than near-normal years," Mason



This graph from the Wisconsin State Climatology Office shows average Halloween temperatures across Wisconsin between 1991 and 2023. While there is year-to-year variability, the data show that there is a statewide cooling trend of 0.6 degrees Fahrenheit.

Above: A child wears a lion costume during a Halloween party sponsored by La Colectiva Cultural de Aztlan, ca. October 1991. Photo courtesy of University of Wisconsin–Madison La Colectiva Cultural de Aztlan; Right: UW mascot Bucky Badger takes a photo with a group of trick or treaters on Halloween at Olin House, the UW–Madison Chancellor's residence, located at 130 North Prospect Avenue, on Oct. 31, 2023. Photo by Bryce Richter / UW–Madison

says, "but not as extreme of warmer-than-normal years as I would've thought given the anecdotal evidence."

In addition to a cooling trend, what's also puzzled the climatologists is a distinct lack of snow. According to the data, only three Halloweens in Madison have seen snow, and they've all been recent: 2014, 2019, and 2023. Only one of those years, 2019, saw noteworthy snowfall (four inches), while 2014 and 2023 had less than 0.2 inches fall with none sticking to the ground.

Keep these trends in mind as you plan for this year's frightful festivities; you may want to reconsider your HOT TO GO! getup for something a little warmer … perhaps a Science Hall ghost?

Trip Distance: 3.24 Cheeseburgers

A more digestible CO2 calculator swaps cheeseburgers for carbon.

By Alex Holloway, College of Engineering

Wissam Kontar (left) and Erin Bulson (right) dig into some tasty research on campus. Photo courtesy of Joel Hallberg

A new study authored by University of Wisconsin-Madison engineers introduces public audiences to the carbon dioxide (CO2) emission impact of different modes of transportation through a simple online calculator.

To drive home the point, however, that calculator also translates pounds of CO2 into one of the nation's favorite foods: the cheeseburger.

The researchers, civil and environmental engineering PhD student Erin Bulson and postdoctoral researcher Wissam Kontar and their colleagues, published their study in the May 2024 issue of the *Nature* journal *NPJ Sustainable Mobility and Transport*.

The two say one of the challenges of educating the public about various transportation modes' environmental impact is that it can be difficult to envision how much CO2 an individual trip might pump out. Adding to that complexity is the fact that it can be even more difficult for people to comprehend what a pound of CO2 emissions really means.

"We thought carbon emissions might not necessarily be intuitive to the public," Bulson says. "We wanted to use a different way to communicate this information, so we tested it out with cheeseburgers, which is unique and happens to be a culturally appropriate fit for Wisconsin."

The calculator's approach is simple: Enter a trip's distance and it shows the estimated carbon emissions for cars (gas, electric and hybrid), a bus ride, bicycling (regular and electric), and walking. Then, the calculator converts all of those pounds of CO2 into a cheeseburger equivalent (about 4 pounds of CO2 per burger). The research showed promising results: 46 percent of study participants reported having a better understanding of CO2 emissions after a three-month period of using the calculator. Additionally, their own travel mode changes typically resulted in fewer emissions.

A 10-mile trip generates about nine pounds of CO2 emissions for a traditional gasoline car, five for an electric car, six for a hybrid car, and nearly six for the bus. In cheeseburger equivalents, that works out to approximately two burgers for the gas car, 1.24 for the electric, 1.44 for the hybrid, and 1.42 for the bus. Taking an electric bike produces an estimated .15 pounds of CO2 — or a miniscule .04 cheeseburgers. Walking and using a normal bicycle did not produce CO2 emissions.

It's not the first time burgers have made it big in research. For example, the Big Mac Index, created by *The Economist* in 1986, uses the Big Mac to illustrate differences in purchasing power parity across countries. Similarly, researchers have considered the carbon impact of a cheeseburger — 1.9 kilograms, or roughly 4.2 pounds, of CO2 per burger — while studying how displaying carbon emissions affects customer decisions in restaurants.

Bulson and Kontar used the Greenhouse Gases Regulated Emissions and Energy Use in Technologies (GREET) model created by Argonne National Laboratory to assess the life cycles of the different transportation modes to determine their emissions.

The researchers conducted a study with 49 participants in Madison who each used the calculator for at least 20 trips. Before the study began, the team conducted a survey that collected basic demographic data, information about travel habits, and an assessment of participants' environmental awareness. Throughout the study, participants kept track of their intended transportation mode for each trip and whether checking its CO2 emissions with the calculator changed their transportation plans.

Almost half the study's participants reported changing transportation modes at least once. Sixteen percent of the total trips (155 of 978) involved a shift, with the most frequent being gasoline car to bus, bus to walking, and gasoline car to walking. Overall, participants recorded about 544 pounds less CO2 emissions due to travel mode changes. That's about 130 cheeseburgers.

"Overall, the net result from these changes was a positive environmental implication, which means a reduction in emissions," Kontar says. "From a socioeconomic perspective, we saw that income, trip distance and a person's environmental awareness were the best predictors of whether someone would change transportation modes."

Bulson and Kontar hope their study sets the foundation for further research, with larger and more geographically diverse surveys. Ultimately, they hope the calculator, or a similar tool, can be integrated into navigation apps to display planned trips' carbon emissions for users to consider, just as we do now when weighing the estimated travel time and distance of one route against another.

Photo by iStock / Matka Wariatka

"Maybe at first glance it doesn't sound terribly scientific, but anything that encourages people to use this is a good thing."

— Erin Bulson

"If you use Google Maps, you might see that your home is three miles away and it's a 20-minute trip, and with traffic maybe it's 30 minutes," Kontar says. "You get familiar with that because you keep using it over and over again. It's data, and people trust data. It's an easy way to gain trust and build understanding about emissions from real life experiences." Bulson and Kontar are also considering expanding the comparison food beyond cheeseburgers — for example, comparing a trip's emissions to the carbon impact of an apple or to popular regional foods.

One thing is clear: Based on feedback, the study's participants liked the cheeseburger references in the calculator. Bulson says the study's final survey included several responses that indicated thinking of their trips in terms of burgers helped participants grasp how emissions vary from trip to trip and travel mode to mode.

"Maybe at first glance it doesn't sound terribly scientific, but anything that encourages people to use this is a good thing," Bulson says. "At the end of the day, the crux of what we're looking at is how we can get more people engaged with these tools to better understand and reduce carbon emissions."

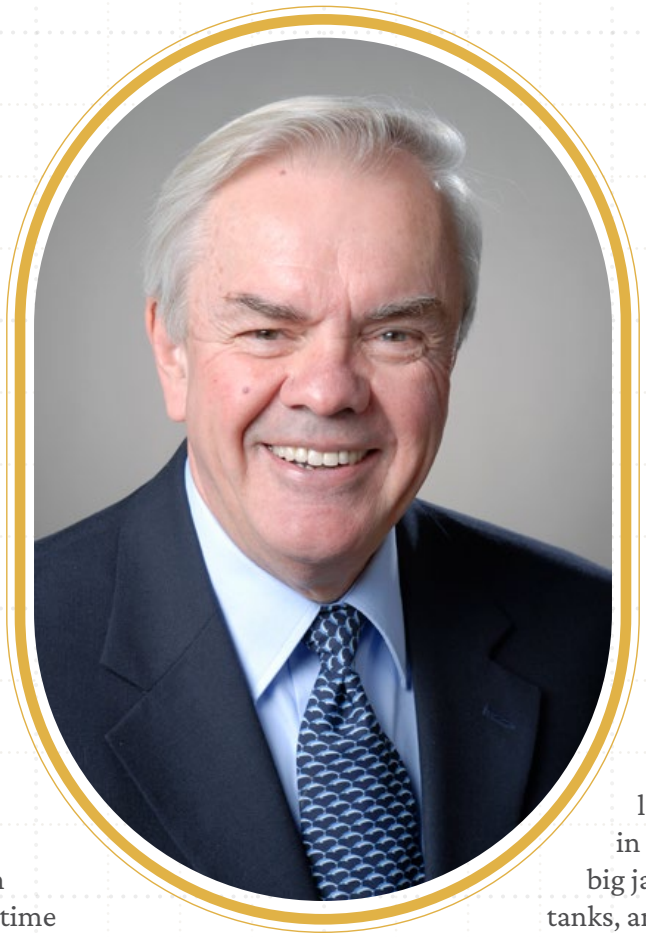
Bulson, who developed the Nelson Institute's corporate sustainability internship program, is a student under Keith and Jane Nosbusch Associate Professor of Civil and Environmental Engineering Andrea Hicks, who is also the Nelson Institute's Hanson Family Fellow in Sustainability. Civil and environmental engineering Professor Soyoung Ahn also collaborated on the research. Kontar studied under Ahn and Hicks before graduating in 2022.

This story was originally published by the College of Engineering.

The Chronicles of Cal

Retired Nelson professor Cal DeWitt has led an incredible life, with his legacy forever preserved through the Waubesa Wetlands.

By Anica Graney



Cal DeWitt considers his childhood normal — that is, except for the zoo he kept in his backyard. "I did most everything that was normal," DeWitt said. "But I never got into any fights because the other boys knew I had snakes. They did not dare tango with me because I had all these reptiles, and they were just scared sick."

At the age of three years old, DeWitt was given a turtle as a pet. By the time he graduated high school, he had amassed an entire collection of animals in his backyard. At its height, sometime during the 1950s, DeWitt owned two alligators, a lizard, an assortment of frogs, toads, salamanders, and fish, 39 parakeets, a cockatiel that lived in the kitchen, and all the species of turtles and snakes native to his home in Grand Rapids, Michigan (except for a live rattlesnake — he had a dead one that was preserved in alcohol). "My backyard zoo just got bigger and bigger," DeWitt said, becoming a member of the American Society of Ichthyologists and Herpetologists at the age of 19. "People actually came over on Sunday afternoons to show their children my zoo."

Through this hobby, DeWitt taught himself how to perform surgery on birds, removing cancerous growths off his own birds and other neighborhood pets. Eventually, word got around to the president of the State Veterinarian Society who controls veterinary medicine in Michigan. Instead of cracking down on DeWitt for practicing veterinary medicine without a license, he was granted permission to continue to perform surgery on birds as no other veterinarian in the state was trained to. The only caveats were that DeWitt couldn't charge anything and he couldn't advertise his services.

On top of bird surgery, DeWitt invented an automatic system for regulating water levels for his various fish tanks in his basement aquarium. "I had big jars of water on the sides of the tanks, and when the water level started to go down, they automatically connected to keep the same level. Anyway, it was a lot of glasswork and hydraulics," DeWitt said. After learning about the New York Aquarium's water leveling system through a publication, DeWitt thought his own system worked better and wrote to the director of the aquarium detailing his system and how to run it. Nine months later, DeWitt received a letter from the director saying they had adopted his system. "I didn't know how important that was. I mean, I was excited about it, but no one really knew about it," he said.

DeWitt's friends and family were sure that he was going to go to school to become a veterinarian, but he had another plan for himself. Bird surgery and inventing water tank regulation systems were, of course, just casual hobbies. DeWitt had his sights set for academia, motivated by the curiosity and inspiration he would

instill in the neighbors and friends who visited his backyard zoo.

"So, that's where my teaching began, in my backyard zoo," DeWitt said. "People would wonder, 'Why do you keep these reptiles? Aren't they dangerous? What are they good for?' Well, what happened was I learned how to teach, but I hadn't been instructed in how to teach. So, I taught how to behold things. That's what I did as a kid — spent long hours watching different animals."

To kick off his career in education, DeWitt began teaching a herpetology program at the Grand Rapids Museum at the age of 16. Between his pets and the books he read, more specifically a non-circulating book from his local library titled "The Herpetology of Michigan," he was more than qualified to share his love of creeping animals[1] with the public.

DeWitt attended Calvin College in his hometown which allowed him to keep his zoo all through his undergraduate career. He enrolled in as many biology courses as he could and was soon spotted by the chairman of the biology department who gave DeWitt a lab of his own to study feather development in parakeets. By the time he was a senior, DeWitt was a teaching assistant for microbiology and embryology courses, using the same techniques to teach his friends and neighbors about his backyard zoo. "The key was to excite them and make them really interested so they would not only ask questions, but seek answers on their own," he said.

Before starting graduate school at the University of Michigan, DeWitt married fellow biology student, Ruth DeWitt, who didn't bat an eye at his love for reptiles, amphibians, and the like. Supported by Ruth's fellowship, the young married couple began on their master's degrees with DeWitt taking classes in cell physiology, molecular biology, neuromuscular basis of animal behavior, neurophysiology, environmental physiology, and biometrics. The next year, DeWitt received a National Science Foundation graduate fellowship,

Photos courtesy of Waubesa Film (2)

[1] The word herpetology comes from the Greek word herpeton, meaning "creeping animal."

awarded to him through his backyard zoo experience. His local congressman, Gerald Ford, who later became the 38th president of the United States, wrote DeWitt a letter of congratulations on his achievement.

DeWitt continued with his studies and pursued his PhD after being approached by William Dawson, a University of Michigan physiologist. "It was a great honor," he said. "It was like Einstein asking you if you'd like to work on physics with him." DeWitt worked as a lead teaching fellow and conducted research on the environmental physiology of the desert iguana. In order to obtain the information he would need, DeWitt created his own instruments that would measure the hypothalamus of a desert iguana moving along the desert surface. Through this method, he discovered the iguana's head temperature was lower than their body temperature and that they could purposely cool their head by panting. DeWitt wrote a paper on his findings and submitted it to the editor of "Psychological Zoology," now called "Physiological and Biochemical Zoology: Ecological and Evolutionary Approaches." He heard back soon after with word that the journal would not only publish his paper, but publish it without change. Today, the paper is tied for 25th most published in the journal's 90-year history.

Nearing the end of his PhD, DeWitt was invited to interview with a top-level committee of professors at a private club in Detroit. "The odd thing was that it wasn't open to the public," he said. "It was a really long conversation, and two weeks later, I got a call asking me to lunch. At the end of the lunch, they asked if I would like to become an assistant professor at the University of Michigan. I hadn't even applied! I couldn't believe it."

DeWitt graduated with his PhD within the year, and received a commencement address from Lyndon B. Johnson, the current president of the United States at that time. Afterwards, he started his assistant professorship and the beginning of his long career in academia. "I just did what I loved to do," he said, "and it was about then that I started thinking about what my dad told me. My dad was a painter and decorator, and he told me to do whatever I wanted with my life, but only do what I

Neighbors, scientific colleagues and fellow advocates of land stewardship, Joy Zedler and Cal DeWitt discuss the past, present and future at Waubesa Wetland, south of Madison. Photos by David Tenenbaum (2)

loved and do it so well that someone will eventually pay me for it. So, my whole life has been like that."

Cal DeWitt, professor emeritus at UW–Madison's Nelson Institute, has been studying the Waubesa Wetland since he moved into a house bordering it in 1972. "If you think you know all there is to know about a wetland, you're mistaken," he says.

After a few years and a few kids, DeWitt wanted to take a sabbatical in New Zealand to study the tuatara, an ancient reptile that lives in the Cook Strait between the north and south island. However, Warren Porter, a zoology professor at UW–Madison, convinced DeWitt to take his sabbatical in Madison instead. DeWitt taught seven seminars during his time in Wisconsin and became very much acquainted with the faculty, to which he decided to make the switch from wolverine to badger and join the Nelson Institute, back then called the Institute for Environmental Studies.

The year was 1970 and the early days of the Nelson Institute were motivated by Senator Gaylord Nelson's emphasis on connecting disciplines around environmental issues. As such, DeWitt was hired as a professor without a department, the only one in the entire university. "My assignment, directly from the chancellor, was to address the problem of the fragmentation of the disciplines," he said, and went to work teaching classes on a variety of subjects.

During this time, DeWitt and Ruth were living in graduate student housing, but knew they wanted to buy their own land, preferably near a marsh. DeWitt had spent enough time in desert climates studying iguanas — it was time to branch out and become more acquainted with wetland ecosystems. The couple bought a house and some land south of Lake Waubesa near Oregon, Wisconsin, today known as the Waubesa Wetlands State Natural Area, all thanks to DeWitt's work over the years.

Now working in Science Hall, DeWitt set forth making the space his own, figuring out ways to get his own laboratory and equipment. After a few years of teaching at UW–Madison and living on the wetlands, DeWitt wanted to extend his classroom to the outdoors, specifically his own backyard. He worked the logistics out with the university by classifying his home as a part of the university, not by sale, but by arrangement, and began to teach his classes out on the marsh. His students would spend the first few weeks exploring the wetlands and figuring out what potential research projects they would want to work on, eventually submitting a research proposal which would be reviewed by DeWitt who acted as a consultant.

"They conducted research and developed their findings into a professional paper. Then I gathered all the neighbors, the town chairman, and a couple of other interested people from the Madison area, and we'd put a screen in the house and have a seminar for everyone. We did that for 30 years, and the neighbors fell in love with the Waubesa Wetlands. They owned it, and they began giving it away. And now it's a thousand acres," DeWitt said.

Recently, DeWitt's 20-year-old grandson, Ben, created a documentary about the wetlands, featured at the Nelson Institute's Tales from Planet Earth film series. "He spent a lot of his childhood here. Ruth would take him out to the creek and look for fish and invertebrates." DeWitt said. The film, "Waubesa Wetlands: An Invitation to Wonder" explores the uniqueness of Wisconsin's wetland habitats along with the history of the one DeWitt worked to preserve.

"This has kind of become a famous place, but no one can really know because it's too awesome for that. There's 6,000 years of history here," DeWitt said. "The area's worth millions, and it hardly cost us a dime."

Extra! Extra!

Across the institute, Nelson faculty are making headlines.

By Chelsea Rademacher

An Instagram post by @phlbikeaction on August 1, 2024

Would Jesus park in a bike lane? For Philadelphia churches, it's a real question

Religion News Service, August 20
Quoted: Kurt Paulsen, faculty affiliate

Allowing street parking for churches can make sense, especially since their services usually happen at times of low traffic.

Read more

Photo by iStock / Evgeny555 and NASA

The Moon is silently inching away from Earth; here's what it means for us

The *Economic Times*, September 3
Quoted: Stephen Meyers, Center for Climatic Research faculty affiliate

By comparing ancient times to our current understanding, this ground-breaking research seeks to synchronize the geological clock with cosmic rhythms.

Read more

Photo by iStock / NanoStockk

Former croplands could be 'sweet spot' for renewable-energy production

KMIT, September 5
Quoted: Tyler Lark, scientist in the Center for Sustainability and the Global Environment

"We ideally want to avoid our best and most productive ag lands, but we also don't want to encroach on pristine or native ecosystems. And so formerly cropped lands might hit that sweet spot in the middle."

Read more

Farm challenges continue

Agri-View, September 5
Quoted: Paul Mitchell, faculty affiliate

"That's usually what happens when prices are collapsing; yields are really high. It's always weird when the crops do well, but you don't do so well economically."

Read more

Photo courtesy of Agri-View

Is a Postmodern building historic? The answer might determine a downtown office tower's fate

The *Milwaukee Journal Sentinel*, September 5
Quoted: Sissel Schroeder, Center for Culture, History, and Environment faculty associate

The building's homage to Flemish Renaissance Revival architecture – City Hall's design – resonated with board member Sissel Schroeder. "I think that's what made this stand out compared to other Postmodern buildings in Milwaukee."

Read more

Photo by iStock / StellaMc

[Colorado Parks and Wildlife Commission] looks at coexistence with predators

The *Denver Gazette*, September 9
Quoted: Adrian Treves, professor of environmental studies

"Treves indicated that daily range riding with low stress cattle handling was effective over the grazing season with a two-year budget of $100,000. Luckily, there is $20,000 in grant monies available for range riders."

Read more

Photo by iStock / AB Photography

From the Office of Sustainability

A monthly update from faculty, staff, and students in the Office of Sustainability - Education and Research. This month's column is from Will Erickson.

Will Erickson

The third annual UW–Madison Sustainability Symposium will take place on Wednesday, Oct. 23, 2024, from 1–5:30 p.m. at the Wisconsin Institute for Discovery.

Hosted with support from the Nelson Institute for Environmental Studies, the Data Science Institute, Facilities Planning & Management, University Lectures, and the UW Environmental Awareness Fund, the symposium provides a space to share research on sustainability, generate ideas, and inspire collaboration. All students, staff, and faculty are welcome to attend.

We are thrilled to have Dr. Sara Beery (Massachusetts Institute of Technology) deliver our keynote on sustainability and AI. Beery's research focuses on building computer vision methods that enable global-scale environmental and biodiversity monitoring across data modalities. She was previously a visiting researcher at Google, working on large-scale urban forest monitoring as part of the Auto Arborist project.

There will be lightning talks and a poster session from students, staff, and faculty highlighting a broad range of sustainability initiatives on campus, as well as a reception. We will also be joined by staff from the Sustainability Research Hub, who will be sharing takeaways from their recent Sustainability Visioning Event.

Online registration is open through Monday, Oct. 21. Day-of registration will also be available at the event. You can learn more and register here.

With nearly 400 attendees at last year's event, the symposium provides a great platform to share your work, engage with fellow researchers, and establish new connections on campus.

We hope to see you there!

Director's Cut

A quarterly update from Carol Barford, director of the Center for Sustainability and the Global Environment.

In an extramurally funded research center like SAGE, each new grant is literally the "coin of the realm!" And we have a new grant at SAGE right now, entitled "*Health-First Climate Action Research Center*." SAGE members Drs. Jonathan Patz and Tracey Holloway are the new center director and lead of the center's main research project on health and energy, respectively. In addition, SAGE/LaFollette faculty member Dr. Morgan Edwards, and SAGE research scientists Drs. Monica Harkey, Paul Meier, Vijay Limaye, Jenny Bratburd and Sam Younkin will participate in the center. The center will also include "cores" on community engagement and data science, led by colleagues from the UW–Madison's Schools of Medicine and Public Health, Computer & Data & Information Sciences, the Medical College of Wisconsin, and UW–Milwaukee.

The Center is the first of about a dozen new centers funded by the National Institutes of Health (NIH) as part of a new climate change and health initiative. Of these, most will be focused on climate adaptation, which has intuitive connections to health. Think of public cooling centers during heat waves, or community access to clean drinking water during drought. Wisconsin's new center will instead focus on connections between climate mitigation (i.e. reducing greenhouse gas emissions) and health. Think of walking or riding a bike to work (improves physical fitness) or switching from coal to renewables for electricity generation (reduces respiratory illness). SAGE researchers have published many papers* along these lines, working across disciplines to analyze co-benefits of climate mitigation. However, as the name implies, the new center adds the twist of thinking of health first. Think of this: What are our community health challenges, and how can we make sure that the health and environmental justice impacts of the next energy transitions are not only robustly quantified, but also grounded in community knowledge, engagement and participation?

This is a very exciting opportunity for SAGE. We anticipate that not only senior researchers but also a new cohort of graduate students will learn and co-produce cutting-edge, urgently needed knowledge of how to protect human health and fight climate change, together. Watch for an official announcement in the months ahead.

Carol Barford

Four Things You Didn't Know about Land Tenure

Learn from Lisa Naughton, a Nelson Institute faculty affiliate and professor of geography who spoke at a Weston Roundtable Lecture in September.

By Chelsea Rademacher

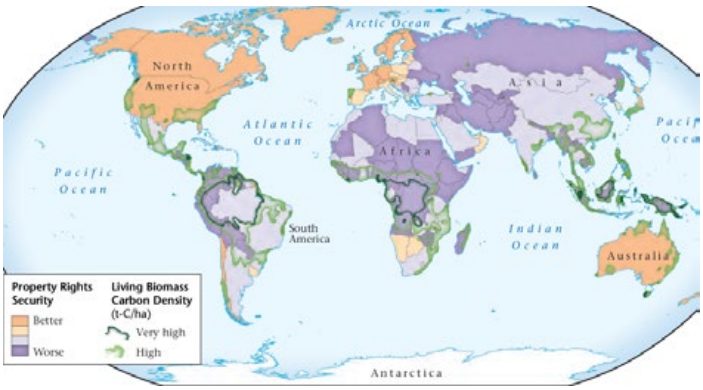
"I've found, over the years, that the terminology with land tenure is often kind of murky," says Lisa Naughton, faculty affiliate in the Nelson institute's Center for Sustainability and the Global Environment (SAGE). As she defines it, land tenure is an umbrella term that encompasses the policies and institutions that determine who can use what, how, and for how long. It's a concept that's been around since the feudal system, but one that has grown increasingly complex amid climate change and biodiversity loss.

On September 19, Naughton spoke at a Weston Roundtable Lecture, a weekly discussion hosted by SAGE. In her talk,"Good for the Poor, Good for the Forest?" Naughton discussed the concepts of tenure, its relationship to deforestation, and how we can move forward.

Here are four things you might not have known about land tenure.

1. **Good land tenure works against good biodiversity.** According to a map that Holly Gibbs, fellow SAGE researcher, created as a graduate student, the countries with problematic property rights have the highest carbon density and biodiversity. "If the planet is hoping that tropical forests will sustain biodiversity and will help offset some carbon emissions, we have to pay attention to land tenure," Naughton explains.

2. **It's not as simple as creating more protected areas.** To sustain biodiversity, we need to expand the world's protected areas … but people already live there. The people who live and depend on that land can't (and shouldn't) be removed, Naughton says, nor is it possible to pay all of them a fee.



Map courtesy of Holly Gibbs

3. **Formalizing land tenure can both slow and hasten deforestation …** Securing land tenure can help communities under threat from logging operations, for example, and can help inspire landowners to care for the environment. On the other hand, securing tenure can create erosive land markets, displace low-income land uses, and capitalize agriculture. To Naughton, these points are the elephant in the room when it comes to determining whether or not formalized tenure will help or harm forests. "We're talking about South America, though … so it's the tapir in the room," she jokes.

4. **… but we have to do it anyway.** "There is no choice," Naughton concludes. "There have to be efforts to formalize land tenure, but it is a politically fraught, uncertain process, and it needs as much attention to supporting environmental governance as it does to getting the borders right."

Watch the full talk to learn more about the relationship between land tenure and deforestation.

Where do the worlds of AI and sustainability meet? Find out at the third annual UW–Madison Sustainability Symposium. Join us on Wednesday, Oct. 23, at the Wisconsin Institute for Discovery. The Sustainability Symposium provides a space to share research on sustainability, generate ideas, and inspire collaboration. All students, staff, and faculty are welcome to attend this no-cost event.

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My classmates and I drinking tea and eating cake in Copenhagen.

We're Not in Madison Anymore

Emily Johnson spent the spring semester in Scandinavia as a Global Gateway Fellow.

Story and photos by Emily Johnson

The UW Global Gateway Initiative is a scholarship program that supports students in studying abroad. Students who are selected as Global Gateway Fellows receive $10,000 towards any study abroad program, or the domestic "study away" and internship program in Washington, DC. In the summer of 2024, Nelson Institute undergraduate Emily Johnson traveled to Sweden and Denmark as a Global Gateway Fellow. As part of the fellowship, she shared her reflections upon returning.

One of the first things that hit me was Scandinavia's culture of leisure. In Stockholm, it's called Fika. In Copenhagen, it's called Hygge. Yes, they are two separate things; yet, they both have an underlying message of relaxation. "Be present, no phones. Eat a kardemummabullar with your friend. Take a stroll by the canal at sunset." As a U.S. college student, I am constantly on the go. I always have things to do whether it's homework, my job, or one of my clubs. To relieve that stress, I might do that work in a pretty cafe. However, in Stockholm, you can't. There were plenty of signs outside of those places saying, "No phones after 14:00." It was Fika time. Additionally, those stores might

Maybe the UW should do something like this ... instead of Fika or Hygge, we would call it "Terrace Time."

— Emily Johnson

Class dinner in Svalbard.

close at 6 p.m. I found out quickly if I wanted to do anything fun after class, I always had to do it right after. I found it frustrating.

But I also reminded myself of the benefits of it. I'm pretty sure we've all heard of the constant headlines that Americans are working too much. That we are constantly on our phones and it's rotting our brains. Or how we are more lonely than ever. But we never do anything about it. Here in Scandinavia, they are. They want to get rid of the toxins of the 21st century and let people enjoy themselves. They dedicate time to leisure and being present with family and friends.

Swedish meatballs from an outing excursion in Stockholm.

Out of the many things I loved about their culture, this was the superior one. I wish that America had a culture rule like this. There is a reason for Scandinavian happiness, and this is one of them. Do you know how much happier we would be? Maybe the UW should do something like this. Every day from 3–5 p.m., students aren't allowed to do any homework. Instead of Fika or Hygge, we would call it "Terrace Time." We would drink lemonade by the lake, play some card games, and throw a frisbee here and there. No phones allowed, obviously.

STUDENT SNAPSHOT

Emily **Johnson**

Major:
History, Environmental Studies

Hometown:
Wausau, Wisconsin

Program:
DIS – Study Abroad in Scandinavia in Copenhagen

Being a Global Gateway Fellow means a lot! Not only will I receive financial and academic support, I will also get to share my experience to future study abroad participants. One personal goal I have is to learn about my heritage. I have ancestry in Denmark and hope to explore the cities they grew up in.

I most look forward to learning about Copenhagen and Stockholm sustainability. These countries have been renowned for their leadership in the initiative, and I hope to apply their knowledge in my future career as a sustainability educator.

Can't-Miss Moments from Rendezvous 2024

The annual event convened hundreds of Nelson Institute alumni and friends.

By Chelsea Rademacher

L-R: Jeff Rudd, Laura Miller, Arlyne Johnson, Curt Meine, Dean Paul Robbins, Gloria Castillo Posada, and Emily Reynolds (director of community engagement and alumni relations) celebrate their 2024 alumni awards. Photos by Hedi LaMarr Rudd (6)

"If you're an alum, your legacy is only growing here on campus."

— Paul Robbins

Rendezvous on the Terrace, the annual gathering for alumni of the Nelson Institute, looks a lot different today than when it started. "It used to just be me and Marty [Kanarek] holding a few tables at the Terrace," joked Dean Paul Robbins. As the institute has grown, so has its alumni community, which is now nearing 14,000 graduates. It's fitting, then, that the annual gathering has grown from a few folks on the Terrace to an at-capacity Tripp Commons in Memorial Union.

This year, alumni from around the country gathered to celebrate the institute and champion its future. With ties to the Nelson Institute that span decades, alumni and friends swapped stories, shared memories, and made new connections. Here are four can't-miss moments from Rendezvous 2024.

1. Rousing Remarks from Robbins
The party kicked off with Dean Paul Robbins, who shared his perspective on the state of the institute. "All of this growth wouldn't be possible if it weren't for the tireless efforts of staff, faculty, and all of you that support the institute in so many ways."

2. A Surprise Retirement Party
Longtime Nelson Institute faculty member Paul Zedler, who announced his retirement earlier this fall, was honored for his decades of campus service. Zedler joined the faculty in 1998 as a professor of environmental studies. He also chaired the environment and resources graduate program from 2008 to 2010 and was a previous associate director/dean of the Nelson Institute.

Rendezvous ON THE TERRACE

3. Celebrating Alumni Excellence ...
A Rendezvous tradition is the celebration of the current cohort of alumni award winners. This year, seven alumni were recognized: Arlyne Johnson, Curt Meine, and Jeff Rudd received Distinguished Alumni Awards; and Gloria Castillo Posada, Naomi Louchouarn, Laura Miller, and Anna Weinberg received Rising Star Alumni Awards.

4. ... Part Two
New this year, the Center for Culture, History, and Environment — one of the Nelson Institute's four research centers — honored some of its alumni with the first annual CHE Alumni Award. Heather Swan, UW–Madison senior lecturer, and Nathan Jandl, associate director of sustainability at the UW–Madison Office of Sustainability, were both honored by center director Will Brockliss.

Clockwise: Will Brockliss (left), director of the Center for Culture, History, and Environment congratulates alumni award winners Heather Swan and Nathan Jandl. Dean Paul Robbins (left) recognizes Professor Paul Zedler, who recently announced his retirement. Laura Miller (center), one of the 2024 Rising Star Alumni Award winners, celebrates with friends.

Top: Dean Paul Robbins congratulates Arlyne Johnson, a 2024 Distinguished Alumni Award winner. Above: More than 200 alumni and friends registered to attend this year's event.

Illustrating Prairie Ecology

PhD graduate Liz Anna Kozik communicates science through comics.

By Anica Graney

In her dissertation, Kozik often inserts herself and reflects upon her own experiences with nature. Illustrations by Liz Anna Kozik (2)

While attending the Rhode Island School of Design for her undergraduate degree, Liz Anna Kozik became very aware of the fact that she was a Midwesterner on the East Coast. "I felt weird surrounded by people from either coast. Everyone came from cities with long histories, and I came from Chicago nowhere suburbia," Kozik said. "But one special thing that I did have growing up was prairie."

Kozik lived next to the Morton Arboretum in Lisle, Illinois, and while living on the East Coast, she drew from her past environmental experiences at the Arboretum and the Illinois Prairie Path to inspire her art. Centered around prairie aesthetics, her work aims to communicate environmental issues as efficiently as possible, combining intriguing illustrations to pull viewers in and concise text.

"I picked the Nelson Institute because interdisciplinarity was the point, and the program gave me the freedom to build my own committee across different disciplines and work with scientists and humanities scholars. That flexibility couldn't really happen anywhere else."

— Liz Anna Kozik

After graduating, Kozik returned to the Midwest to work as a product designer, but soon felt the pull to return to her work in an academic setting. She then enrolled at UW–Madison and started her MFA at the School of Human Ecology in the Design Studies program, combining art and environmental studies that she developed her education into a PhD.

"I picked the Nelson Institute because interdisciplinarity was the point, and the program gave me the freedom to build my own committee across different disciplines and work with scientists and humanities scholars. That flexibility couldn't really happen anywhere else," Kozik said.

Her PhD looked at prairie restoration through historical and ecological lenses with the goal of obtaining a grounded experience that balanced both the humanities and science sides. Kozik wanted to make sure that her work didn't fall into the traps of focusing on one side over the other. Take, for example, invasive species. "There's lots of interesting writings about invasive species, and some humanities scholars who argue that invasive species doesn't exist as a category, just a cultural idea. On the other hand, scientists face a very real problem where a problematic species is taking over a habitat and that it needs to be managed," Kozik explained.

As an intermodal scholar, Kozik's dissertation was produced through the work of comics — fully illustrated works that are specifically geared towards accessible language. "Or at the very least, using the least amount of words to talk about very complicated subjects," Kozik said, pointing that the goal of her

work was to make information more available to more people, and not just other scholars.

On top of that, Kozik uses a specific style to draw people into her art: "My work is very aesthetically pleasing, and that is a very intentional choice. It's kind of like carnivorous plants that smell like dead animals to attract insects into them. I make something very pretty so it's compelling, and in the end, you end up reading complicated things you wouldn't read otherwise."

Liz Anna Kozik

Even as a humanities scholar, Kozik appreciated the opportunity to work with scientists in the field, one being Ellen Damschen, a professor of Integrative Biology whose research focuses on prairie and savannah biomes. "I was invited into her lab as a full member and attended meetings and interacted with scientists. I didn't feel like I had to apologize for my background but was welcomed for the diversity of perspectives that I brought to the table," she said.

Now graduated, Kozik works as a research coordinator for the Rethinking Lawns project at the Chicago Botanic Garden. Her position combines her experience as a science communicator and researcher as her team investigates native alternatives to lawns with the goal of increasing biodiversity, carbon sequestration, and stormwater infiltration.

Looking back, Kozik advises others looking to complete a PhD to "build a committee that supports your goals while still being academically challenging." For her, that was accomplished through MacArthur genius and world-famous comic artist, Lynda Barry, who sat on Kozik's committee. "One of the benefits of being a Nelson student meant that I got to have Lynda Barry on my committee, who treated comics just as much an academic discipline as the other disciplines I was working within," Kozik said. "That was a wonderful opportunity, and I couldn't have made the work without that."

"I like letting the dissertation speak for itself," Kozik said.

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