Nelson Institute for Environmental Studies
UNIVERSITY OF WISCONSIN–MADISON

August 2024

THE COMMONS

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

Green Thumb, Green Office

Weeds, garlic, and a campus accolade for the Nelson Institute staff.

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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 photo by Chelsea Rademacher

INSIDE

From the Dean

Greetings, Nelson community,

Sure signs that summer is winding down are folks sharing "what I did on my summer vacation" and already seeing the first signs of excitement for the fall semester. I can attest the power of summer travel as my family and I just returned from my first ever trip to Alaska where we had a chance to see humpback whales (making a comeback despite troubling sea temperature warming) and glacial ice (in retreat but still remarkable in extent and wonder). I hope your summer was equally fulfilling.

There are many things to look forward to each fall (including lower dew points), but one thing I eagerly await is the annual Rendezvous on the Terrace event, a remarkable opportunity that unites the Nelson Institute's past, present, and future. It's incredibly rewarding to watch connections being forged between alumni and current students, and on top of that, I get the distinct honor of recognizing our new cohort of alumni award winners — most of whom make the journey back to Madison just for us!

Last month, we announced the full list of honorees, and over the next two issues, we'll give you the chance to *really* get to know each of them. This month, I'm pleased to introduce our Distinguished Alumni Award winners: Arlyne Johnson, Curt Meine, and Jeff Rudd. If you're at all familiar with the Nelson Institute, you've probably heard these names.

After earning both her master's and PhD from the institute, Arlyne joined us after a career in applied conservation, and helped us transform the conservation biology and sustainable development program (her master's program!) into today's one-of-a-kind environmental conservation program. She now serves as an adjunct professor, teaching the Conservation Planning course each fall. Arlyne has led wildlife research and conservation throughout Asia and Latin America for decades and students here hugely value her depth of experience, her profound warmth, and her dedication to wild nature.

Next up is Curt Meine, whose Nelson Institute dissertation became the go-to text on the "father of conservation," Aldo Leopold. Curt wears many hats these days: he's a senior fellow with both the Aldo Leopold Foundation and the Center for Humans and Nature, a research associate with the International Crane Foundation, and an adjunct professor with the UW–Madison Department of Forest and Wildlife Ecology. Curt is an amazing scholar but also possesses a rare knack for storytelling, a love for Wisconsin landscapes, and a profound generosity of spirit.

And last but certainly not least, we have Jeff Rudd, without whom our superb energy policy and analysis program simply would not be what it is today. Jeff is the embodiment of the word *interdisciplinary*. After studying biological sciences and philosophy as an undergrad, he went on to law school and had an early career as a criminal prosecutor. He then came to our environment and resources PhD program, where he specialized in the environmental effects of nanotech. Jeff has an extraordinary skill set; he joins his expansive understanding of environmental policy with a deep grasp of financial markets and a passion for solving environmental problems. Trust me, you want to chat with this guy!

But that's not all, folks; flip the virtual pages to read about even more first-rate folks in the Nelson Institute community — *your* community.

On, Wisconsin!

Paul Robbins
Dean, Nelson Institute

Back to School, Badger Style

It may still feel like summer, but back-to-school season is in full swing here on campus. Students have moved into apartments around town, and the residence halls are preparing for the arrival of bright-eyed first-years. What's your back-to-school style? Take this personality quiz to find out which back-to-school Badger you are! Photo by Bryce Richter / UW–Madison

Take the quiz

Feature

Green Thumb, Green Office

Nelson Institute staff members get their hands dirty to keep their operations green.

By Chelsea Rademacher

The forecast had predicted rain, but blue skies prevailed as two dozen Nelson Institute staff members tromped through the paths at Troy Community Gardens, snacking on wild blackcap raspberries along the way. The group was headed toward the treeline on the north end of the garden, beyond which sits rows of organic cabbage, sweet potatoes, and more. This is Troy Farm, and it's one of Madison's oldest urban farms.

For being located just off the bustling Northport Drive on Madison's north side, the farm is a surprisingly serene — and large — setting (the triangle-shaped plot of land could fit nearly 10 Science Halls). Paul Huber, the farm's director, leads the group of Nelson staff members to a tool shed. The team is here for a volunteer work day, so as Huber doles out work gloves, metal rakes, and weeding tools, he gives an overview of the farm and its mission.

Troy Farm is one of two urban farms and three community gardens that make up Rooted, a local nonprofit that helps create healthy, equitable, and sustainable neighborhoods through food, land, and learning. Anyone can volunteer at the farm, and the certified organic produce that's harvested goes right back to the community, he explains. The shed is located behind an impressive solar array, which provides all of the farm's electrical needs (any surplus goes back to the city's grid).

If this all feels very green, so is the Nelson staff's reason for being there. In May, the Nelson Institute's administrative offices in Science Hall received certification through the Office of Sustainability's (OS)'s Green Office Certification. Now, they're working toward achieving a platinum-level designation.

The Green Offices program began in 2017 as one of the OS's efforts to help the UW–Madison campus move toward a more sustainable future. In the program's first year, five offices were recognized (the Nelson Institute among them). Today, 16 offices are certified and an additional 10 offices hold platinum status.

Nelson's certification process started in November 2023, when business manager Robin Higgins reached out to the Green Office intern team. The interns met with Nelson representatives in March, which was followed by a checklist for the office to complete in order to earn its status. Among the to-dos were setting printers to print double-sided, using switch-activated power strips, and having clearly marked landfill and recycling bins.

Right after receiving its Green Office designation, the Nelson team started the next steps toward a platinum designation. First, OS interns conducted waste and energy audits of the offices, complete with recommendations for areas of improvement. "Your office does a very good job at being energy efficient and energy conscious," the energy audit noted. "Many offices had devices and appliances unplugged when they were not in use. This is a great habit to encourage!"

The third and final step for the Nelson Institute to go platinum was to have 50 percent of its staff volunteer with a community organization. That's what brought the Nelson team out to Troy Farm for a day spent weeding and harvesting garlic. "The Nelson Institute has had a long relationship with Rooted, with our students volunteering there and alumni working there. This felt like a natural fit and opportunity for the Nelson staff to give back to an organization that has long supported student experiential learning," says Emily Reynolds, the Nelson Institute's director of community engagement and alumni relations. "It was a great morning of sunshine, camaraderie — and lots and lots of garlic!"

"It was a great morning of sunshine, camaraderie — and lots and lots of garlic!"

— Emily Reynolds

Welcome, Bees!

In June, UW–Madison earned a recertification by Bee Campus USA.

By Marek Makowski, Office of Sustainability

Photo by Bryce Richter, University Communications

This summer, the Xerces Society for Invertebrate Conservation recertified UW–Madison as a Bee Campus, extending its status as one of eight universities in Wisconsin and one of nearly 200 in the U.S. to hold the designation.

"This is a moment worth celebrating," said Ian Aley, Green Fund program manager for the Office of Sustainability and cofacilitator of the Bee Campus Committee. "We are already seeing the addition of pollinator-supporting habitats and changes of maintenance practices because of this certification, and a lot of relationship-building work and collaboration is happening behind the scenes. Stay tuned: there will be more exciting work in the years ahead!"

UW–Madison first achieved Bee Campus USA certification in September 2022. Early this year, it underwent the lengthy process of submitting for renewal.

"To get the certification, you have to commit to working toward improving pollinator habitat across your campus, setting up a committee, and having a structure for it," said Alex Frank, project portfolio manager for the Office of Sustainability (OS) who collaborated with graduate assistant and entomologist, Victoria Salerno, to collect and submit data for the Bee Campus applications. "It's the recertification where you have to prove that you've actually made progress."

According to the Bee Campus USA website, the certification signals a commitment to reduce pesticide use, create educational opportunities and service-learning projects about pollinator conservation, and "enhance pollinator habitat on campus by increasing the abundance of native plants and providing nest sites." At UW–Madison, the recertification resulted from a wide-ranging collaboration between students; staff from the OS, Grounds, Lakeshore Nature Preserve, UW Arboretum, and Department of

Campus Planning and Landscape Architecture; and faculty from Departments of Plant Pathology and Entomology.

"This is what the Bee Campus initiative helps us do that we otherwise might not have done ourselves very naturally," said Claudio Gratton, a Nelson Institute affiliate and professor in the Department of Entomology whose lab studies pollinators and the benefits of insect conservation. "To bring people from all of these different sectors of our institution to help come together and figure out how we can work together to make conservation actually work."

UW–Madison's efforts began with its first submission for a STARS rating, the benchmark for tracking sustainability performance at higher education institutions across the world. As part of his role as then-data analyst for the OS, Frank and sustainability staff sought opportunities for improving UW–Madison's rating and found that STARS recognized the Bee Campus USA certification.

"Bee Campus rose to the top of the list as something that fit well with what we and our stakeholders find important," said Frank. "It also builds on some great expertise that we have with experts on campus and leaders in pollinator science and conservation."

A History of Collaboration

The committee established by Frank, Aley, and Salerno found expertise in many departments on campus. Susan Carpenter, the native plant garden curator for the Arboretum, began her role in 2003 and noted a rise in interest for pollinator gardens on campus in 2010, when a visitor from the University of California–Davis spotted a rusty patched bumble bee in the garden. In 2013, the Arboretum served as a case study for a bumble bee conversation document published by Xerces, the organization that evaluates Bee Campus USA applications.

In subsequent years, Grounds began to incorporate native plants more frequently, the Lakeshore Nature Preserve increasingly stimulated the growth of native plants, and the State of Wisconsin, Dane County, and City of Madison enacted pollinator protection plans to protect the 500 bee species native to the state.

Each effort, Carpenter said, benefits both the conservation of bees and the many plants that benefit from or depend on pollination.

On campus, Carpenter pointed to the educational benefits of pollinator gardens — both for the 750 volunteers who learn to care for the gardens each year and for the various researchers studying the species the gardens attract.

> *"[Bee Campus] builds on some great expertise that we have with experts on campus and leaders in pollinator science and conservation."*
>
> — Alex Frank

"Having a [pollinator] garden like this brings in a lot of insects, animals, birds, and once they're there, you're more likely to notice them, and you're more likely to learn about them, because they're right in your community," Carpenter said.

Because of his research with pollinators, Gratton was invited to join the Bee Campus USA Committee, the advisory board for the initial Bee Campus efforts at UW–Madison. He noted that the certification allowed members of the board to think about integrating bee conservation and pollinator gardens into the university's teaching and research missions.

"This is great because I've always been interested in: how do you go from the research and the science that we do in our labs to actually seeing change on the ground?" Gratton said.

Hannah Stahmann and Emily Valentine, cochairs of the student sustainability advocacy group Campus Leaders for Energy Action Now (CLEAN) and members of the ASM Sustainability committee, contributed to the

Members of the Bee Campus Committee, including Susan Carpenter (Arboretum), Robert Scott (Grounds), and Rhonda James (Campus Planning & Landscape Architecture), at the School of Education's Native Plant Garden project. Photo by the Office of Sustainability (2)

recertification through their campaign to reduce the use of pesticides and increase native plants via Re:wild UW–Madison, another student group they oversee. While faculty and staff Bee Campus efforts continued, the students decided to reach out to the Green Fund with proposals for rewilding campus.

"Madison already has such a beautiful campus, but we want to make it beautiful for everyone. Cut lawns and synthetic pesticides aren't good for the soil, for the ecosystem," Valentine said. "[Native] plants have been here for thousands upon thousands of years, and they know this ecosystem. They've evolved with the ecosystem. The same with the insects and animals around it — they've also evolved."

To learn how to effectively campaign for action at UW–Madison, Stahmann said they attended trainings by Re:wild Your Campus, the broader nationwide student organization. Yet at the meeting, she realized they did not need the preparation after all.

"It was really a pleasant surprise," Stahmann said. "We found out that there were already people on campus that were really interested in doing this, and that were doing it in a different way. That was really amazing to hear and made me hopeful."

Re:wild UW–Madison's successful proposal means that the Green Fund will pay to help establish an organic landscape management pilot on four campus sites: Library Mall, Henry Mall, Ogg Residence Hall, and the Divine Nine Plaza, where Grounds will forego synthetic inputs, opting for soil testing, site-specific efforts to support soil health like the application of compost, and mechanical techniques to manage pests. Faculty in the Department of Plant Pathology will offer services and share expertise in sustainable turfgrass management with Grounds staff, while the Bee Campus Committee will advise the team during the pilot.

"This is definitely showing students that the university cares about their health, about the future of the planet, and about the health of Grounds workers," Stahmann said.

As they developed their Green Fund project, the students met with Grounds staff, asked questions, and observed ongoing plans for reducing pesticides and increasing native plants.

"How do you go from the research and the science that we do in our labs to actually seeing change on the ground?"

— Claudio Gratton

"Projects like these give a really good opportunity for students who want to actually do something and make campus a better place to enact policies they want to see for themselves but also for future students who want to come here," Valentine added.

The Bee Campus recertification also informed students and staff about actions already happening on campus, such as Grounds's shift to an integrated pest management system for greenhouses, as well as the Arboretum's substitution of soap for glyphosate (Roundup) to treat weeds. A group of Green Fund students and partners established a pollinator lawn at Tripp Residence Hall. Another team is establishing a native plant garden at the School of Education featuring plants that benefit pollinators and hold cultural significance to native peoples of Wisconsin so that the garden can be a resource for place-based indigenous education on campus. The Green Fund is supporting a team of students and partners with the creation of a bee hotel at Allen Centennial Garden. Salerno contributed to and analyzed UW–Madison's Bee Campus efforts — including bee hotels, pollinator habitats, chemical alternatives to pest management, and public outreach — to produce a thesis about their benefits to campus.

Additionally, Salerno gathered the data and authored and submitted the recertification application.

"The Bee Campus work really embodies this idea of cross-campus involvement," Frank said. "It's a perfect example of how we bring together campus operations, land managers like our Grounds department, our Arboretum staff, motivated and interested students, and smart faculty, with our office being a sort of connector to facilitate a safe space for all these groups to come together and try some new things."

The Future of (Bee) Campus

UW–Madison turned 175 over the past academic year; this year, the Arboretum turns 90. The anniversaries have spurred action, like the university's new sustainability goals — a reminder that, Carpenter said, "sustainability is no longer a choice of [whether] we're going to do it or not do it."

Sustainable Turfgrass Use and Management (HORT 261) students learn from grounds staff as they plant the Tripp Pollinator Lawn. Photo by Ian Aley

A tiger swallowtail (black morph female) was spotted during the Insect Ambassador Butterfly event at the Biocore Prairie in the Lakeshore Nature Preserve.

Gratton looked to the recertification as a marker of societal and institutional progress, and as a beacon for the future.

"When I started here 20 years ago, we weren't really talking that much about climate change and the impact that it has on people's daily lives," he explained. "Similarly, we've recognized the impacts that humans have on the environment. What I'm seeing now is there's a collective sense of, if we can work together on some of these challenges, we can mitigate the worst outcomes that might occur if we let things kind of continue the way that they are."

With the data collection that led to the recertification, the staff plans on continuing to establish effective land care practices and scaling them across campus, as they establish more pollinator-supporting landscapes, study them, and harmonize the need for spaces that are welcoming to both humans and pollinators.

"This is not a one-year project, this is not a 10-year project," Gratton continued. "This is a mindset-change project that is going to continue on for a long time, and that's what I'm particularly excited about."

This story was originally published by the Office of Sustainability.

Finding Farmland

Abandoned farmlands could play a role in fighting climate change. A new study shows exactly where they are.

By Chris Hubbuch, Great Lakes Bioenergy Research Center

Photo by iStock / Slattery613

Farmland is often a battleground in the fight against climate change.

Solar panels and energy crops are pitted against food production, while well-intended policy choices can create incentives for farmers to till up new lands, releasing even more heat-trapping gas into the atmosphere.

That's why strategies for sustainable plant-based fuels focus on marginal lands — fields that are too hard to cultivate or don't produce good enough yields to be considered profitable.

A new tool developed by scientists at the University of Wisconsin–Madison could help relieve that tension.

Led by Yanhua Xie and Tyler Lark, researchers with the Great Lakes Bioenergy Research Center (GLBRC) and Nelson Institute research center affiliates, the team used machine learning to map roughly 30 million acres of U.S. cropland abandoned since the 1980s, creating a tool that could guide decisions about how to balance production of energy and food.

Their findings, published in the journal *Environmental Research Letters*, include the most detailed mapping of previously cultivated land in the United States to date and provide field-level resolution of abandoned farmland that could be used to grow crops like switchgrass or sorghum, which can trap carbon in the soil and serve as feedstocks for biofuels and replacements for petrochemicals.

"If we can understand where these lands are, what the characteristics are, we can really understand their true potential for things like climate mitigation," said Lark, a scientist at the Nelson Institute's Center for Sustainability and the Global Environment.

Lark, who studies land use change and its impacts

on land and water resources, said that understanding could be used to direct clean energy investments where they have the least competition with other beneficial uses.

"That's a key application of this," Lark said. "Whether it's for solar photovoltaic, or agrivoltaics, or cellulosic bioenergy development, or just restoration of natural ecosystems: These sites could be great candidates for a lot of those applications."

The study was a collaboration between researchers at UW–Madison and Michigan State University (MSU) and was funded by the U.S. Department of Energy. The resulting data are publicly available in the GLBRC's interactive atlas of U.S. cropland, which also maps trends in farmland expansion and irrigation.

Higher Resolution Insight Made Possible by Machine Learning

Researchers have traditionally relied on datasets like the USDA's Census of Agriculture, which provides county-level estimates of farmland at five-year intervals and can be used to estimate how much land has been taken out of production.

U.S. Energy Secretary Jennifer Granholm (middle) and U.S. Senator Tammy Baldwin (right) speak with Tyler Lark (left), scientist with the Great Lakes Bioenergy Research Center about an interactive tool for mapping abandoned farmland. Photo by Matthew Wisniewski, Wisconsin Energy Institute

But there was no way of knowing exactly where that land was or when it was abandoned.

"Most of these estimates have all been at the county level," Lark said. "This is really the highest resolution analysis available, looking right on the landscape — field by field, acre by acre — of where these crop lands are."

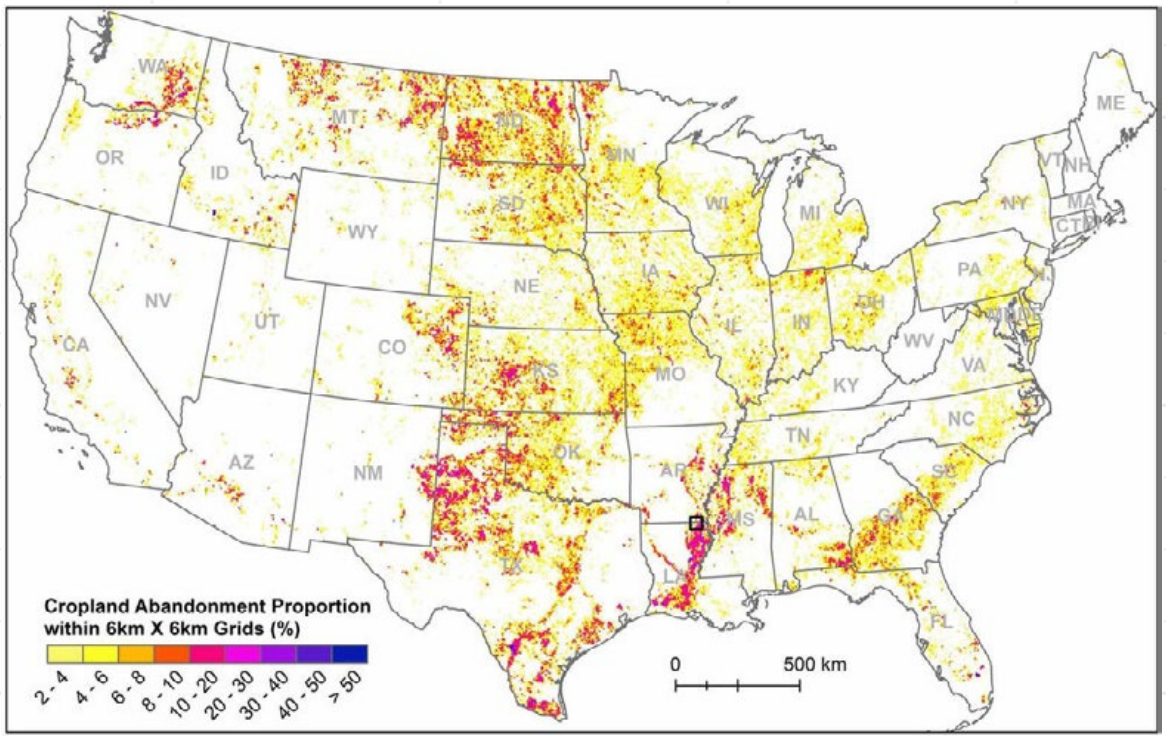
While satellite imagery has been around for decades, without recent advances in cloud computing, Lark said it was impossible to classify the nearly 2 billion acres of land in the coterminous United States.

dict the precise location of abandoned croplands nine times out of 10 and can even pinpoint the year they were abandoned with about 65 percent accuracy.

A New Pool of Land

Analyzing the data, they found that more than 30 million acres of cropland were abandoned over those 32 years, most of which were concentrated in the Great Plains and along the Mississippi River between southern Illinois and the Gulf of Mexico.

That number does not include urbanized land, which Lark said is unlikely to ever return to cultivation.



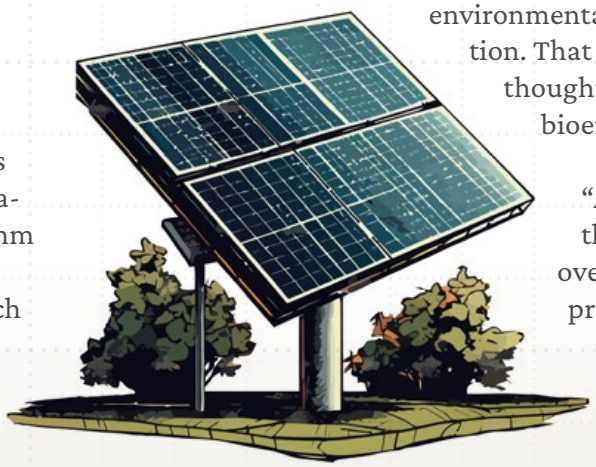
A map showing the percentage of abandoned farmland within a 36-square-kilometer area. Most of the more than 30 million acres of cultivated land abandoned between 1986 and 2018 is concentrated in the Great Plains and the Mississippi River valley.

Of the abandoned cropland, more than half changed to pasture or grassland and about a third was either shrubland, forest, wetland, or bare.

Lark was surprised to discover that less than a fifth of abandoned land was enrolled in a formal conservation program, such as USDA's Conservation Reserve Program, which pays farmers to take environmentally sensitive lands out of production. That means more land than previously thought could potentially be used to grow bioenergy crops.

"A lot of the assumptions were that this former cropland had a lot of overlap with formal conservation programs," Lark said. "But we saw that they're almost entirely distinct pools."

To construct the team's analyses, Xie, now a professor at the University of Oklahoma, used existing land cover data to train a computer to read those images and recognize patterns of cultivation. They then had that algorithm analyze satellite data from 1986 through 2018 and categorize each pixel to determine whether it was cultivated that year.



The results accurately pre-

Researchers can now use the re-

sulting data to model how much biomass could be grown on these lands as well as their potential to trap carbon dioxide from the atmosphere in the soil.

GLBRC scientists did just that last year for a landmark report that charts a path for the United States to achieve a net-zero greenhouse gas economy by 2050, in part through land-based solutions.

"There is great potential for carbon sequestration and bioenergy production on these fields," said Bruno Basso, an MSU professor and co-author of the Roads to Removal report.

Tyler Lark

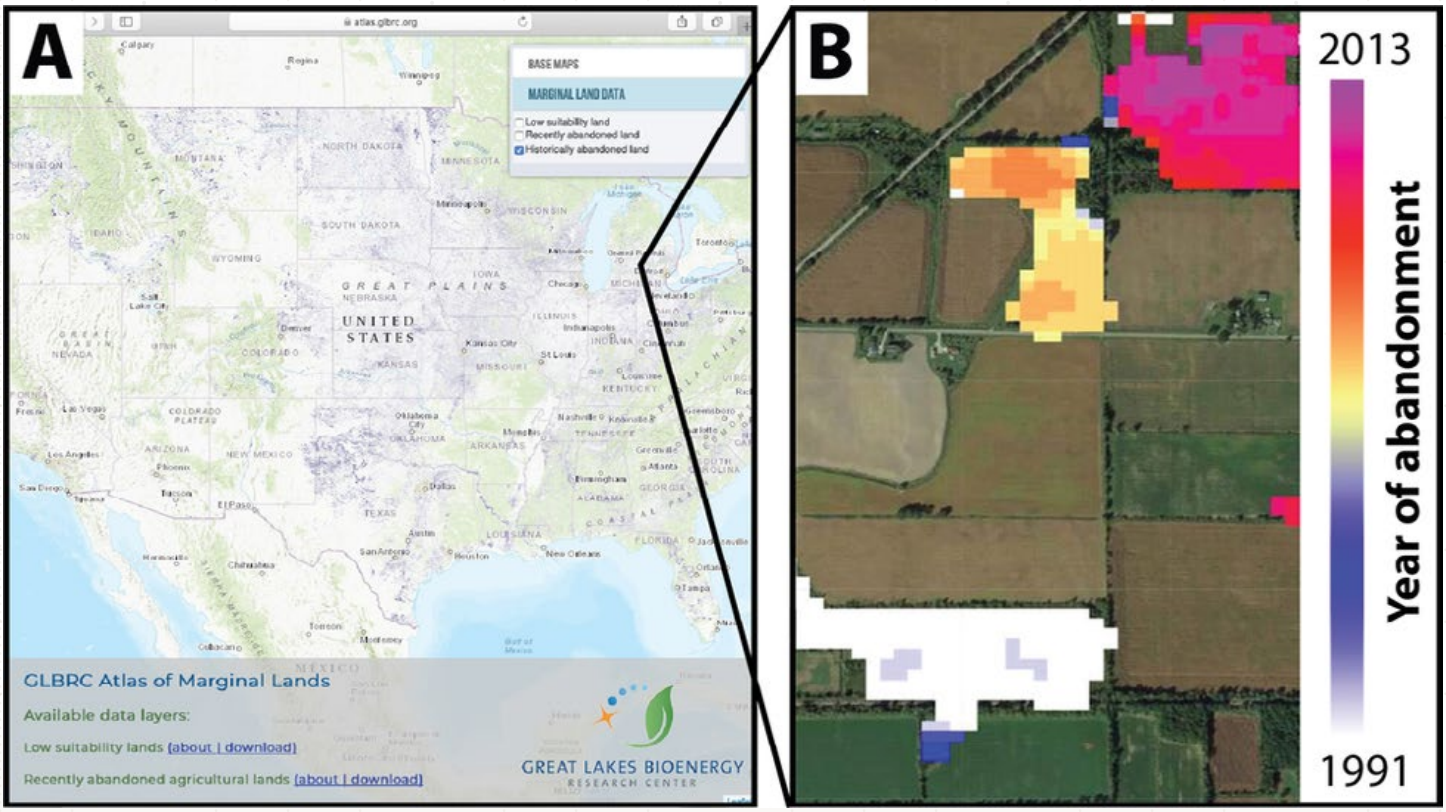
The study does not explain why the lands were abandoned.

"The next step is to figure out the drivers," Lark said.

To do that, Lark says the team may pull in other information like socioeconomic data and tax records to get a better sense of what's happening at the parcel level — for instance, whether a farmer took one field out of production or sold the entire farm — and use that to identify potential uses for the land.

"If they're farming a bunch of hay, that's probably more easily adaptable to cellulosic biofuel feedstock, because they might already have the equipment … and you could harvest something like switchgrass then too," Lark says. "If it's somewhere where there's no agricultural production at all anymore, it might be harder to do that, but maybe more suited for a solar installment."

This story was originally published by the Great Lakes Bioenergy Research Center.



Screenshot of the GLBRC Atlas of Marginal Lands, which allows users to explore and download spatial datasets (A), and a zoomed-in example of the abandoned cropland dataset in a 1.5km2 section of southern Michigan (B). Field color in (B) indicates the earliest year in which land was no longer cultivated.

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 Erikson, academic program manager.

Will Erikson

Now in its second year, the Corporate Sustainability Internship Program provides UW–Madison students with real-world sustainability experiences in a corporate environment over a 12-week summer session. With administrative support provided by the Office of Sustainability and the Nelson Institute, the program connects businesses with a broad talent pool of excellent undergraduate and graduate students from across the university. We partner with host organizations to create new, project-based sustainability internships. Our program manager then matches these custom roles with a selection of students who have the appropriate skills. After completing interviews with the host organization, the selected intern works under the guidance of mentors within their host organization, which directly compensates them. Additionally, selected interns receive a small scholarship from the university.

Prior to starting their internships, students participate in a sustainability and corporate culture bootcamp with the Office of Sustainability. All summer projects require interns to research strategies to make business processes sustainable, calculating cost comparisons, and making recommendations to implement these improvements. Corporate sustainability projects include the evaluation of:

- At least one quantifiable sustainability metric (e.g., gallons of water saved, kWh of electricity, tons of waste reduced, etc.)
- How the environmental sustainability project fits into a business framework (e.g., regulatory-driven, market research, process improvements, internal training materials, etc.)

The interns write a case summary and a final report documenting results and recommendations, then present the findings to management at their host organization.

This summer, we placed eight interns with the following host organizations throughout Wisconsin:

- **Lands' End:** Scope 3 emissions reporting
- **Madison Gas and Electric:** ESG reporting
- **Oshkosh Corp.:** Electrification assessment framework
- **Alter Metal Recycling:** Sustainable materials assessment (test plot installation) and emissions accounting research
- **C-Motive:** Emerging technology market research
- **TRC:** Solar farm siting, permitting, and construction
- **Findorff:** Sustainable construction (the intern will become LEED certified)
- **Reynolds Moving and Storage:** Battery charger retrofit design

In addition to preparing UW students to become leaders in sustainability, this program demonstrates that improved environmental performance is a cost-effective investment for Wisconsin's business sector. All project results are quantified in dollars saved as well as environmental metrics.

If you are a potential host organization, a UW–Madison student, or a faculty or staff member, and would like more information about the program, please submit an inquiry form.

Director's Cut

A quarterly update from Will Brockliss, director of the Center for Culture, History, and Environment.

I hope you're all having a fulfilling and productive summer. Here's the latest from CHE.

We kicked off the summer break with our annual field trip, the Place-Based Workshop (PBW). Anna Andrzejewski kindly organized a three-day visit to the UW–Madison Arboretum, to coincide with its 90th anniversary. A mixture of hands-on activities and discussion reconnected us with the ideals of ecological restoration introduced by Aldo Leopold, the Arboretum's first director. At the same time, we engaged with the people and places of the Arboretum, its partners in the university and the Ho-Chunk Nation, and with an array of environmental professionals: artists, poets, entomologists, ecologists, and conservationists.

The PBW provided a fitting conclusion to a busy year of colloquia, social events, and conferences. But if you were thinking that the rest of the summer is downtime for CHE, quite the opposite is the case. Our faculty and graduates devote the summer months to groundbreaking research projects. Nicolas Rueda Rey, for example, is studying the involvement of the British American Tobacco company in South America. Inigo Chotirawe Acosta is investigating pineapple plantations and their impact on the history of land use in the Philippines.

Thanks to the generosity of Jay and Renée Knight, CHE is able to distribute graduate research and travel awards every year, to support the research projects of Nicolas, Inigo, and many others. This September, however, we are introducing a new roster of awards to recognize the pioneering work of CHE alumni. Our winners this year, Heather Swan and Nathan Jandl, are both former CHE graduate associates who are now leaders in their fields and in the UW community. Heather, who is senior lecturer in the UW–Madison Department of English and the Nelson Institute, specializes in ecocriticism and environmental writing. Her book *Where Honeybees Thrive* (Penn State University Press) exemplifies the ways in which she uses creative writing to draw urgent attention to environmental problems. Nathan, who is associate director in the UW–Madison Office of Sustainability, plays a leading role in sustainability projects on campus and in guiding the university in the practical steps necessary to meet its sustainability goals.

We are grateful for the opportunity to recognize Nathan's and Heather's work and look forward to celebrating the achievements of other CHE alums in subsequent years!

Will Brockliss

Listen Up!

Three podcasts for your next roadtrip, brought to you by Edge Effects.

By Chelsea Rademacher

Summer may be winding down, but there's still time to squeeze in one last vacation. Whether it's by car or bus, train or trail, *Edge Effects* — a digital magazine about environmental issues produced by graduate students at the Center for Culture, History, and Environment (CHE) — has your audible entertainment covered. Here are three can't-miss podcasts from Edge Effects.

"Something in the Water: A Podcast on PFAS in Wisconsin"
Bonnie Willison and Richelle Wilson of the Public Trust podcast take us to French Island, Wisconsin, to meet a community directly impacted by PFAS.

> "In 1970, there was a plane crash that was right off of [La Crosse Regional Airport] property. We know for a fact that a [PFAS-containing)] firefighting foam was used at that crash. Then in 2001, there was another crash of a small plane, and all of that … leached down through the soil into the groundwater table of that upper aquifer. That's why all of us are under a Department of Health Advisory not to drink our water."

Listen Now

"Maroon Geographies, Black Placemaking, and Abolitionist Futures: A Conversation with Celeste Winston"
UW–Madison PhD student and CHE graduate associate Elijah Levine sits down with Celeste Winston, an abolitionist geographer, assistant professor at Temple University, and author of *How to Lose the Hounds: Maroon Geographies and a World Beyond Policing*.

"Marronage isn't just a form of flight, but also deeply a practice of placemaking. Because of that, there are these kind of material legacies that continue to shape places that once were characterized by a Black flight from slavery, or other kinds of Black freedom projects that maybe weren't even directly tied to flight from slavery, but are connected in the sense of fugitivity and the kind of freedom dreams that are inherent in those struggles."

Listen Now

"Goats, Bees, and Poetry: A Conversation with Nickole Brown"
In this episode, CHE associate Heather Swan and Black Earth Institute Fellow Nickole Brown discuss animals — or as Brown terms them, the "more-than-human" beings.

"The way that a lot of people write about animals … reflects much of Western colonial history in that the representation of non-human life and literature parallels the treatment of those beings in real life. Meaning that we've used these beings just as we've seen fit … [In literature,] they're used as metaphors for how we feel, they're simplified into symbols, they're anthropomorphized … they're denied their own sentience and emotion."

Listen Now

tales from planet earth

Embark on a journey into Waubesa Wetlands as Calvin DeWitt, a wetland scientist and Nelson Institute faculty emeritus, shares the knowledge and wisdom he has found from living on the marsh for over 50 years. Taking these lessons, his grandson, a 20-year-old filmmaker, sets out to gain a deeper understanding of the marsh and his grandfather's unique connection with it.

Screenings

Sunday, Sept. 29, 2024 | 3:30–7 p.m.
Lussier Family Heritage Center

Monday, Sept. 30, 2024 | 6–8 p.m.
Marquee Cinema at Union South

More information and registration at **nelson.wisc.edu/waubesa**

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Real-World Relevance

EAP capstone team publishes journal article on renewable natural gas.

By Michael Kamp, Energy Policy and Analysis

Aerial view of renewable natural gas plant. Photo by iStock / Pete Flyer

Stepping outside the walls of a classroom and solving a real-world problem — that is what the energy analysis and policy (EAP) program capstone project is about. The annual capstone course exemplifies the Wisconsin Idea, which states that the university strives to impact lives beyond the classroom. As the final requirement of the EAP certificate, students are assigned to small, interdisciplinary teams with a UW–Madison faculty advisor and work for real-world clients.

Rob Anex

"[EAP students] bring together all of what they've learned when they're going through the EAP program and put it to work in addressing a real energy analysis and policy problem," EAP Professor Rob Anex said. In spring 2022, Anex was the faculty advisor for a capstone project team, helping the students frame the problem and providing connections.

The capstone team comprised four graduate students spanning campus: Alicia Hoffman (atmospheric sciences), Unni Kurumbail (chemical and biological engineering), Noah Rhodes (electrical engineering), and Jamey Anderson (international public affairs and law).

The capstone teams are interdisciplinary by design so students can step outside their research siloes and be challenged by new perspectives. "As a law and policy student, it was a really enriching experience to be able to work with students from science and engineering departments on the EAP capstone project," Anderson said.

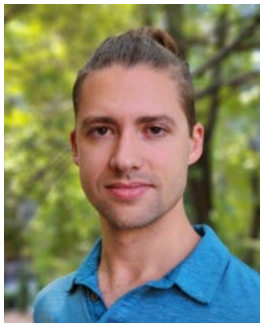
For this team's capstone, they were tasked to determine renewable natural gas (RNG) potential in Minnesota by the Minnesota Department of Commerce. They looked at capturing methane from decomposing materials in landfills, swine and dairy manure, and wastewater treatment plants, then converting this waste methane into natural gas — a process known as RNG. With the Minnesota Natural Gas Innovation Act of 2019, projects could start applying for funding to incorporate RNG, but there was a lack of information on how much RNG was available in Minnesota.

Most RNG estimates were on a national level or for other states, and the information in Minnesota pertained to single RNG resources. "This was the first analysis in Minnesota to consider multiple renewable natural gas resources," Hoffman said.

After a semester of work, the team ran the analysis to determine that 10 percent of natural gas use in Minnesota in 2019 could be replaced by RNG. Besides presenting to the

Alicia Hoffman

Unni Kurumbail



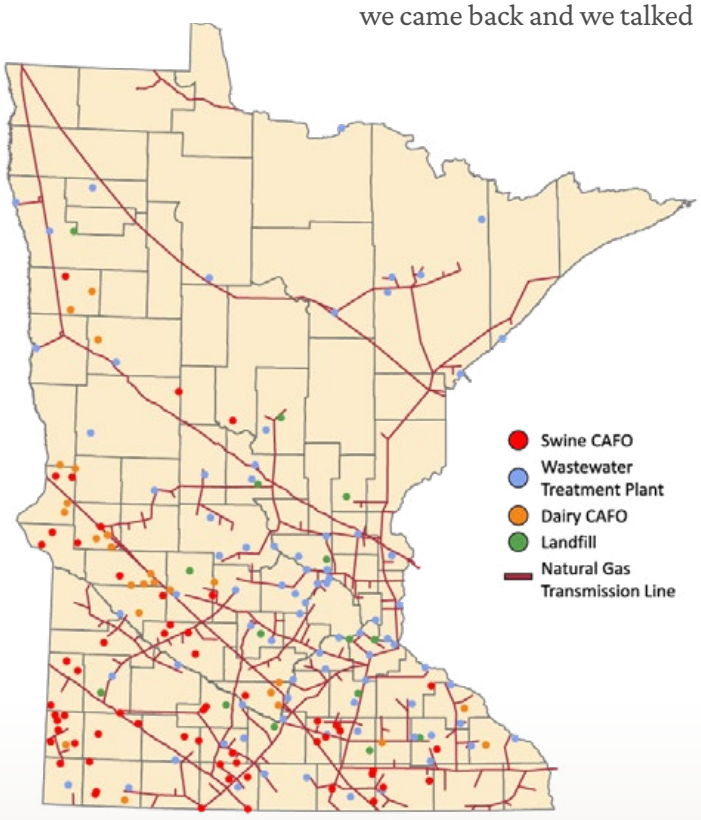
Noah Rhodes

Jamey Anderson

Minnesota Department of Commerce, they presented to the EAP community where they received positive feedback on the quality of their work. Additionally, after reading the written report, faculty advisor Anex said, "It was written well enough that I suggested again, hey, you really ought to submit this."

Due to busy schedules and one team member graduating, Jamey Anderson, there was no initial preparation for a journal article. Then, almost a year later, Hoffman messaged the team to gauge interest after sitting down during a writing day and pulling together some of the material.

The team discussed and decided to pursue the publication. By having time away from the project, the team came back with a fresh perspective. "When we came back and we talked about it, we all had some new ideas," Rhodes said.



Locations of viable RNG sources relative to existing natural gas transmission pipelines in MN. The existing pipeline infrastructure is shown as dark red lines.

With new ideas and no end-of-semester deadline, the team set to work. "The report laid the foundation of what we were going to do, but I think we ended up changing quite a bit," said Hoffman. They cut extraneous information, rearranged the text, discussed the writing process — all pulling from their different backgrounds — and reassessed their methods. The group also iterated a few times with Anex and received helpful feedback from journal reviewers after submitting.

The result was an updated analysis that calculated a slightly lower number (7.5 percent) for RNG potential to replace Minnesota natural gas use in 2019. Mainly, improved estimates from landfills led to the lower percentage. In the paper, they discuss how trucking RNG short distances (virtual pipelines) and fuel credits can improve the profitability of projects as the 7.5 percent refers to the maximum production potential of RNG when no economic or technical barriers were considered.

A lesson learned was on thoroughly reviewing methods. "It makes your paper much better if you go back and really assess the methods you used. If you have any questions or feel unsure of what you've done, it is worth it to take it apart and try again because our analysis was so much better after having redone parts of it," Hoffman said.

On March 7, 2024, the paper was accepted to *Biomass and Bioenergy*. "Why is it good that they turned it into publication? Because they had really done useful work that people out there ought to know about," Anex said. As a published article, anyone interested in RNG can learn from the rigorous and applied research of this EAP capstone team.

Rhodes and Hoffman both mentioned that collaborating with team members from different fields strengthened their paper and allowed them to tackle a complex question. "I don't think any one of us would have individually had the expertise to do this project. It was only possible that all of us came from different programs," Rhodes said.

To EAP staff's knowledge, this was the first time a capstone project led to a publication. It serves as a blueprint for future capstone projects, all of which are also researching practical, innovative, and rigorous energy solutions.

Protect and Preserve

Arlyne Johnson is conserving the future of conservation.

By Chelsea Rademacher

ALUMNI AWARD WINNERS 2024
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In Nam Et-Phou Louey National Park in northern Laos, a boat of tourists quietly floats down the Nam Nern River. The sun went down hours ago, desaturating the forest until it reached total blackness. At the bow of the long-tail boat, a local guide expertly navigates the dark waters. A rustle. A hush. The boat stills as the guide flips on a spotlight. The tourists are mere feet away from a sambar deer, one of Laos' more elusive large mammals. After several moments in silent awe, the guide paddles on, seeing whom else they can find in the shadows.

Across Southeast Asia, and especially in Laos, the illegal hunting and trading of wildlife has been an increasingly devastating problem. These activities pose dire threats to biodiversity and conservation — but to not hunt and trade, for locals facing income insecurity, poses equally grave circumstances. What can you do to protect both the hunter and the hunted? Arlyne Johnson, who arrived in Laos in 1998 through the Wildlife Conservation Society, helped uncover a solution.

Wild sambar deer in Southeast Asia. Photo by Sarawut Sawkhankhet / iStock

A wildlife biologist by training, Johnson had recently earned her master's degree from the Nelson Institute's conservation biology and sustainable development program (now the environmental conservation professional master's program) when she arrived in Laos to work as the codirector of the Wildlife Conservation Society's country program. She fell in love with the country and stayed for 13 years, working with and training scientists, conservationists, and government partners. Around 2006, Johnson and her team were tasked with finding ways to boost tiger conservation in the Nam Et-Phou Louey National Park. The team's research had shown that illegal wildlife trade was causing the park's tiger population to wane. But from her studies at the Nelson Institute, she knew that there were socioeconomic drivers at play, too. If villagers relied on income from killing animals, could the park find an alternative — a way to directly pay for keeping animals alive?

"We decided to test an ecotourism strategy," she says, "which would work with the communities in the areas where the hunting was occurring, to have tourists do a night safari." The concept was relatively simple: with training from the park, villagers would run the excursions, doing everything from driving boats, leading tours, cooking meals, and making repairs. At the end of each safari, the tourists would pay for their experience based on the number of animals they saw. The rarer the animal, the higher the cost. The money went into a fund, which was divided among the villages that participated.

Johnson (second from right) and colleauges of the International Monitoring Team at Laos's Nakai-Nam Theun National Park. Photo courtesy of Arlyne Johnson

Top: Johnson (front, left) conducts a field survey in Laos's Nakai-Nam Theun National Park. Photo courtesy of Arlyne Johnson. Above: Houses along the Nam Nern River in Nam Et-Phou Louey (NEPL) National Park. Photo by E. Briggs

The implementation, however, required the team's expertise in not only conservation, but also change management, community building, and communication skills. Fortunately, just a few years before starting this project, Johnson had rounded out her Nelson education with a PhD in land resources, giving her the perfect background to help make this happen. "Our national park team signed a contract with every community," Johnson explains. "Each family was involved and agreed" — all 859 of them. The contract outlined the fee-for-sighting process; agreed that if *any* villagers were caught hunting or trading wildlife, the entire village would get less money; and stated that employment would be terminated if the contract was violated. In just four years, hunting violations dropped, and the village fund surged.

A trail camera in NEPL captures a tiger on the prowl. Photo by WCS Lao / NEPL

"We weren't successful in conserving the tigers," says Johnson, "but we *were* successful in changing behavior. The prey species — a lot of threatened ungulates like sambar deer and muntjacs — were also declining in this area. We saw that, as a result of our work, those prey populations stabilized and sightings of other carnivore species began to increase."

"Where my passion lies is [in] building the next generation of conservation practitioners."

— Arlyne Johnson

When her work in Laos ended (though the program's continues today), Johnson moved back to the United States and joined Foundations of Success (FOS) as a senior program officer. A nonprofit, FOS works across the globe helping conservation groups "design, manage, and monitor their conservation programs, in a framework that helps them evaluate what's working, what's not, and why," she explains. "We like to say, 'improving the practice of conservation.' " Though she was now based stateside, her work continued to support teams in Nepal, Indonesia, Vietnam, and a familiar stomping ground, Papua New Guinea. That's where, years earlier, Johnson completed her PhD research in the New Guinea Highlands. Part of her project included testing the first iterations of the now widely adopted Conservation Standards, an "open-source, strategic process [that] helps conservation teams achieve lasting impact."

As Johnson was establishing herself with FOS, she also reconnected with colleagues back at the Nelson Institute. She learned that changes were afoot for her master's program — the transition into today's environmental conservation (EC) professional master's program. When asked if she'd be willing to advise the new program's creation, she jumped at the chance; after working for decades in the field, she knew exactly what type of real-world training graduate students would need to be successful. Perhaps equally excited were her colleagues at FOS, who saw a new opportunity to unite their critical work with academic curricula. "The work at Nelson became really a flagship," says Johnson.

She became an adjunct professor, teaching the EC program's ENVIR ST 972: Conservation Planning. Using FOS expertise and the Conservation Standards (that she'd serendipitously helped test in the nineties), students in her class design conservation plans for real-world partners in Wisconsin and around the world. This fall, her students are designing a conservation restoration project with the City of Waupaca, "but at the same time, we're also working with a wildlife conservation project in Cambodia," she says. Through the Sauk City-based International Crane Foundation, students are working on a project focused on the sarus crane, the world's tallest flying bird. "I love it because my students can see [that] you can apply these principles in Waupaca, *and* you can apply them in Cambodia … I think it's the first time they can really see, 'Oh, there's a common framework we can apply to wherever we work.' "

One often thinks about conservation in relation to a specific habitat or species. But when it comes to the arc of Johnson's career, perhaps her greatest achievements have been in protecting and preserving the field of conservation itself. "Where my passion lies is [in] building the next generation of conservation practitioners," she says, so much so that both she and her husband, fellow conservationist Mike Hedemark, want to ensure for decades to

"[Helping] governments and organizations implement conservation programs and train their next generation of people … that's been probably one of the most important contributions I can make in this field."

— Arlyne Johnson

Johnson (far right) leads a training group in Laos. Photos courtesy of Arlyne Johnson (3)

come. In planning for their estate, they created the *Wiel Abus* Fund (which means *wildlife* in Melanesian Pidgin English) to support conservationists from developing countries in attending the Nelson Institute. "For me, that's kind of been the reward of life on this planet," she says. "[Helping] governments and organizations implement conservation programs and train their next generation of people … that's been probably one of the most important contributions I can make in this field."

Many miles and memories have happened since Johnson called Laos home. There, she and Hedemark lived along the Mekong River in a house that welcomed the sounds of the tropics and their neighboring birds year-round. After 25 years overseas, when the pair found their new home in Wisconsin, they did so along the Wisconsin River, a different yet familiar backdrop. Hedemark installed a microphone in their backyard and connected it to a speaker system throughout the house. As Johnson overlooks the lush, green waterway and the sounds of catbirds, robins, and mourning doves pipe into her office, for a moment, it's as if she never left.

Johnson kayaks in front of her home along the Wisconsin River.

Johnson, her husband, Mike Hedemark, and their two dogs.

On Time

Curt Meine uses the past to see the future, and the present to examine the past.

By Chelsea Rademacher

ALUMNI AWARD WINNERS 2024
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If you get the chance to chat with Curt Meine, the man who's become more or less synonymous with *Aldo Leopold*, you may be inclined to pepper him with "What would Leopold think about..." questions. But there's more to Meine than meets the eye, and there's more to his life than Leopold.

Sure, Meine wrote the literal book on Leopold's life — and yes, he was the on-screen narrator of *Green Fire*, the Emmy-winning documentary on Leopold. He also serves as senior fellow with the Aldo Leopold Foundation, and he's done more Leopold-related media interviews than he can count. But the next time you encounter Meine enjoying an afternoon on the Memorial Union Terrace, consider asking him about ... anything else. Like the community-based conservation efforts at the former Badger Army Ammunition Plant (which he's helping lead). Or how, after the Cold War, Bulgaria became one of the first countries to pen a national conservation plan (which he helped develop). Or you could scrap all of that, hand him a guitar, and ask him to play one of the tracks on his newly released album of original tunes.

Curt Meine

Left: Meine (front) leads a group hike. Photo by Gavin Van Horn. Above: Meine (left, with guitar), serenades the Leopold siblings (Carl, Nina, and Estella) at an Aldo Leopold foundation board meeting in 2008. Photos courtesy of Curt Meine (3)

It's the end of June, and Meine has finally made it to the Terrace. Over nearly 90 minutes, he weaves the threads of his life into audible art, humbly dodging praise and yes, politely answering one "What would Leopold think about…" question. It's a quintessential Terrace day. Janitorial sparrows clean up popcorn from the pavers. Parents advise their teenage son on colleges to consider. Tunnel Bob ambles by. The first time Meine was here, it was a quintessential *winter* day. It was January 1981, and it was cold. Very cold. Lake Mendota was covered with a smooth sheet of black ice, dotted with ice fishers and hockey players. "Okay, this is the way you make it through the Wisconsin winters," Meine said to himself. "You get out there, and you have a good time."

It was the Nelson Institute for Environmental Studies that brought the young Meine to UW–Madison. He was completing his undergraduate degree in English and history at Chicago's DePaul University when a UW–Madison brochure in the library caught his eye. "The description of one graduate program captivated me because it was all about interdisciplinary work and about the land," Meine recalls. "[The program] was called *land resources*, and that was tangible. It felt very *real*."

Meine arrived on campus when the Nelson Institute — then, just the Institute for Environmental Studies — was in its adolescence. Though a fledgling program, its professors and advisors were among the best in the world. "For anyone interested in environmental work, it was one huge academic smorgasbord. Not only could you study *anything* here, you could study [it] with some of the leading experts in the world." Meine's interest in climate change and ethics paired him with the likes of John Kutzbach, Reid Bryson, Francis Bretherton, and Cal DeWitt, to name a few. "These were key leading global figures in climate science, and they were all here."

The professors coached Meine's cohort to seek answers by pulling in knowledge from a variety of disciplines. "Our institutions aren't set up that way. We divide ourselves up into our disciplines and fields and professions," says Meine. "And yet, there was the Nelson Institute saying, 'we need to foster this kind of cross-disciplinary, problem-solving way of thinking and connect fields of knowledge.' That's how you solve problems." As Meine considered questions of climate change alongside the burgeoning fields of conservation biology, environmental ethics, and environmental history, his path forward began to take shape; its form a slender, bespectacled man named Aldo Leopold.

"History can't give us the answers, but it can help us understand how we got to where we are. Science can't give us all the answers, but it can give us utterly ecessary information to help you think through it."

— Curt Meine

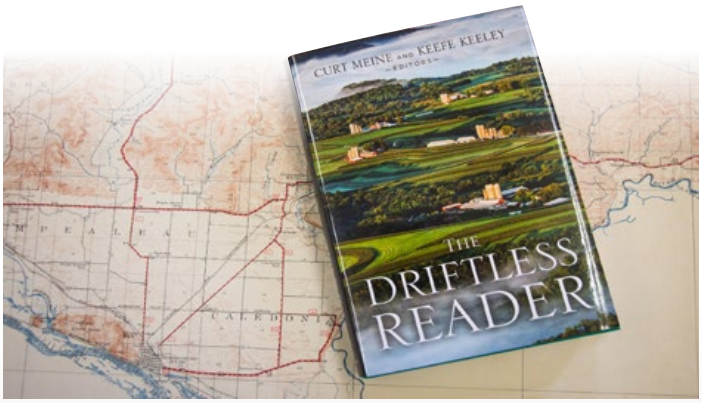
Meine leads a tour for UW–Madison grad students at Coon Valley, Wisconsin.

On Legacy

Whether you're a passionate or casual environmentalist, you've likely encountered Leopold. High school English classes across the country have incorporated his *Sand County Almanac* into their curricula to demonstrate creative scientific writing and introduce the idea of land ethics. And if you remember reading it and not especially liking it, you're in good company. Neither did Meine — at least, not at first. "But of course that's what durable books do," he says. "They bear revisiting, maybe when you're at a different stage in your own development. Where you see things you didn't see at first, or you're a little more tolerant of different ways of expression."

Meine and fellow volunteers gather heritage apples at Maa Wákąčąk/Badger Lands.

Leopold became Meine's anchor as he continued his studies. "For almost any field you can imagine in the environmental world," he points out, "there was some thread that you could track back to Leopold and his contemporaries." But as Meine got to know Leopold, he learned that —though an oft referenced, well-known figure — there was limited scholarship about his life. "Who was this historic figure, and what can we learn from his life and work?" Meine wondered. He went to the academic smorgasbord, taking courses across disciplines and gathering pieces of his newfound puzzle. "It was a time of great cross-disciplinary ferment, and Leopold was in the middle of it."



Alongside Keefe Keeley, fellow Nelson Institute graduate and 2022 Rising Star Alumni Award winner, Meine published a collection of texts and art that highlight the Driftless Area. Photo by Catherine Reiland / UW–Madison

Leopold also became the center of Meine's academic journey; in 1988, he completed his PhD with his dissertation, *Aldo Leopold: His Life and Work*. The comprehensive biography was published shortly afterward and has since become an authoritative text on the "father of conservation."

"We are all just here for a short while, building on whatever came before, for ill and good, and doing our best to carry that baton."

— Curt Meine

After spending his graduate school years exploring Leopold's past, Meine left UW–Madison with renewed clarity for the future. "History can't give us the answers, but it helps us understand how we got to where we are. Science doesn't give us all the answers, but it gives us utterly necessary information to help us think through them. And ethics is essential because it helps to guide us through times of uncertainty." He headed east, where many young hopefuls go to make a difference: Washington, D.C. There he worked for the U.S. National Academy of Sciences in the lead-up to the seminal 1992 Earth Summit in Rio de Janeiro. "That was the most important environmental gathering, arguably, in history," Meine recalls. From Rio came the annual United Nations COP Conferences and the Framework Convention on Climate Change, which led to

the Paris Agreement — and Meine had a front-row seat. "Hell, it wasn't a front seat. We were on the field!"

Also stemming from the Earth Summit was the Convention on Biological Diversity, a multilateral treaty that called for countries to develop their own biodiversity plans. The first European country to do so was Bulgaria, among the most biologically diverse countries on the continent. Meine found himself on the field again, serving as a technical and editorial advisor to the plan's development. "My Bulgarian colleagues had the knowledge, the desire, the experience in the landscape, the concern for their own biodiversity legacy. They were the ones who did the work," Meine emphasizes. "But I got a chance to sit with them and learn from them." Meine sat in those meetings, tears in his eyes. "In the wake of the Cold War, you could feel the pulse of a new wave of democracy and public participation, putting science to work for the public good. Wow. What could be better than that?"

Perhaps the only thing better could be doing this type of work where Meine's roots had taken hold: Sauk County, Wisconsin — the land of Leopold, the International Crane Foundation (where Meine is a research associate), and of another Cold War legacy.

On Land

Off Highway 12, just a few miles south of Tewakąçąk (or Devil's Lake State Park), sits a plot of land that once housed the sprawling Badger Army Ammunition Plant — now more commonly known as the Badger Lands. Active from World War II through the Vietnam War, the plant was officially decommissioned in 1997.

That's when a group of 50 local organizations first gathered to discuss the future of the land. They became the Sauk Prairie Conservation Alliance, with Meine serving as a founding member and coordinator. "We dared to dream, 25 years ago, that this could become a working laboratory in bio-cultural restoration," Meine says, and it has. His activism and expertise have helped bring the land back to its roots: to plants and animals that once called the landscape home, to the 75 farming families who were vacated to build the plant, to members of the Ho-Chunk Nation who were removed in 1837.

People, says Meine, are at the core of conservation. "How do you bring diverse people together to reconcile difficult histories with the opportunities of the present and the needs of the future?" he asks. And if he knows anything, it's how to see those threads of time running parallel. "You're humbled by the history of it, I think," he reflects. "We are all just here for a short while, building on whatever came before, for ill and good, and doing our best to carry that baton. Carry that and pass it on."

An aerial view of the Badger Army Ammunition Plant during its heyday. The land has since been rewilded and returned to its historical owners. Photo courtesy of Badger History Group

Confidence in Uncertainty

Jeff Rudd got comfortable with the uncomfortable, letting uncertainty lead his way.

By Chelsea Rademacher

ALUMNI AWARD WINNERS 2024
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"You need to talk to Tracey Holloway," Nelson Institute Dean Paul Robbins told Jeff Rudd. Rudd, a Nelson alumnus, had recently reconnected with his alma mater and was attending an event as a newly minted Board of Visitors member. He had heard of Holloway — she's rather an A-lister in the science community — but he hadn't met her yet. "Paul asked me to talk to you about converting the energy analysis and policy certificate program into a master's program," Rudd said as he approached Holloway, who was stepping into a leadership role in the program. "Bad idea," she replied. "Okay. Tell me why." They talked for the next two hours.

That was 10 years ago. Since then, downtown Madison has seen the installation of Free Little Libraries with solar-powered phone charging stations. A PhD student attended two COP conferences after publishing a policy analysis on the Paris Agreement. A group of students published their capstone work in an esteemed journal. All of this happened because of a flourishing certificate program — which couldn't have happened without Rudd's support. Though if it were up to Rudd, this story wouldn't be about him at all.

Jeff Rudd

Holloway and Rudd attend a 2024 EAP gathering on the Memorial Union Terrace. Photos courtesy of Jeff Rudd (7)

Looking at Rudd's history, one might be surprised to learn about his connection to an environmental studies institute. But therein lies the interdisciplinary magic. "I think interdisciplinarity is a cornerstone of helping people really overcome some of the limitations that they may impose on themselves," he says. Rudd's story is devoid of self-imposed limitations, perhaps because he's long embraced uncertainty.

As an undergraduate student at Virginia Tech, Rudd double-majored in biology and philosophy. "Philosophy intrigued me because it was hard and it asked a lot of questions," he reflects. "It required me to write and communicate about issues that a lot of people care about but are reluctant to talk about." The link between biology and philosophy, Rudd found, was uncertainty. Can we ever know the nature of knowledge? The meaning of life? What things can't scientific inquiry prove? Why? Rudd found comfort in uncertainty, allowing it to lead the way.

With his interdisciplinary wheels turning, Rudd leapt to his next stepping stone: law school at Washington and Lee University. Digging up his roots in the outdoors, he began to explore a path in environmental law policy. "I quickly learned that most of the people were there to become lawyers, and I adapted in that direction." Adapt he did, and after graduating, he was a practicing attorney for a decade. He was good, but it was hard. "You become a little bit numb. The criminal justice system is a hard place," he reflects. "I always wanted to reconnect with that connection to the outdoors that I had."

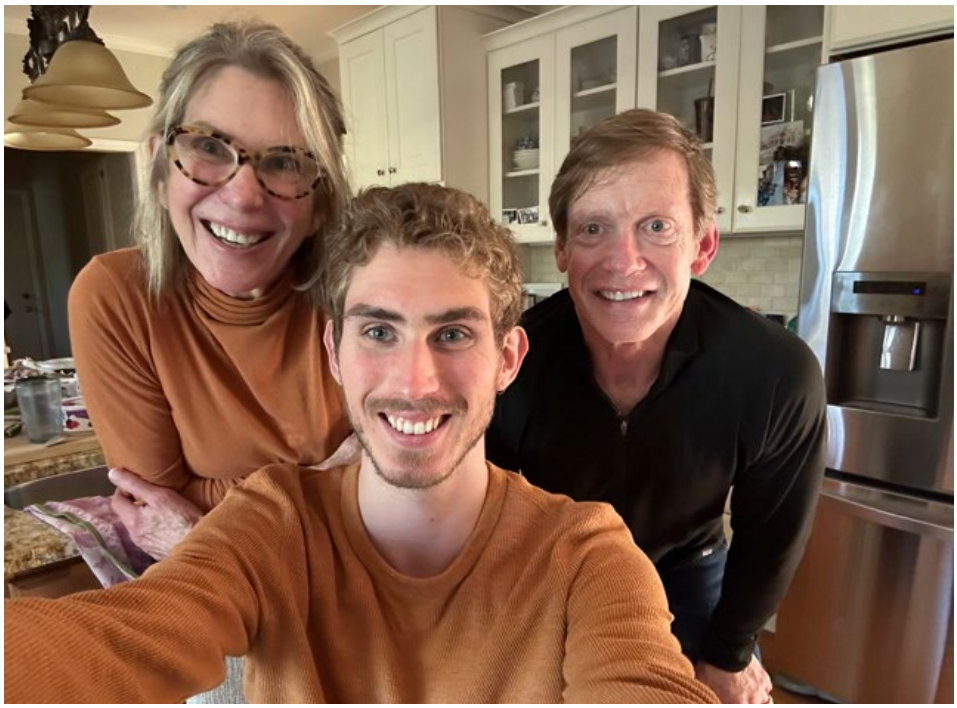
Although Rudd grew up mere miles from the Pentagon, his childhood was largely spent outdoors. He remembers backpacking trips to the iconic Blue Ridge Mountains, which lie among the state's 3.7 million acres of public lands. From his career in the legal industry, he knew the complexities of creating policy, and he grew curious about public lands like the ones from his youth. Of the lower 48 states, Montana has the third highest acreage of public lands, so that's where Rudd went to learn more.

Rudd kayaking with his wife, Jeanne Bissell.

He started his PhD work at the University of Montana, doing ecological and environmental policy fieldwork. He loved the work — and he really loved the location — but his interdisciplinary background felt mismatched, especially if he wanted to teach one day. His advisors guided him to a major research university where he could craft a truly interdisciplinary PhD committee: UW–Madison's Nelson Institute and its environment and resources program.

There he linked up with his advisor: Clark Miller, an

associate professor who now leads Arizona State University's Center for Energy and Society. "What do you know about nanotechnology?" Miller asked him at their first meeting. "Really small stuff?" Rudd joked. He walked out of the meeting with a three-year research position with the UW's Nanoscale Science and Engineering Center. "I walked outside, and I literally laughed because that was completely unexpected," he remembers. From the vast public lands of Montana, he began to study the environmental implications of nanotechnology. "My dissertation dealt with the progression of the nanoscale, the National Nanotechnology Initiative, and then the Nanotechnology Research and Development Act," he explains. "It was a bird's eye view into risk and uncertainty."



Top: Rudd (left) with his stepson, Jackson, and wife, Jeanne Bissell. Above: Rudd and Bissell recently funded a professorship to support the EAP program.

While completing his research, Rudd discovered another area of interest, which carried perhaps more risk and uncertainty than any field he'd explored before: the stock market. Trading and investing are what occupy his days now, though it's less of a passion project. "Do I like it?" he muses. "I like being able to do it, to help me help others and help my family be in a position to feel that they can do the same. That's what I like." What he loves is uplifting the next generation of interdisciplinary scholars, and he found that outlet back in the Nelson Institute and its energy analysis and policy (EAP) program.

Launched in 1980, EAP is one of the world's oldest graduate energy programs. It began as a 40-credit certificate option for master's students in the environment and resources (then "land resources") program, but over the years, it synthesized into a smaller credit-hour program to allow for virtually any UW–Madison graduate student to participate. Enrollment started to drop again in the 2010s, but fortunately that's when Rudd and Holloway, now the program's director, connected. With his own diverse background, Rudd was able to help Holloway forge key relationships that helped expand the program's connections. "She's the reason it happened," Rudd deflects. "She can say that it wouldn't happen without me, but I don't buy it. I just happened to be there."

But "just" being there proved to be lucrative for the program, as Rudd's vast experience brought not only new connections, but new ways of thinking about the op-

portunities for academia and the private sector to unite. "One of the fundamental issues was how [to] improve the student experience," Rudd says. "As the EAP program evolved, we were already thinking about how do we bring in people from the outside, from the private sector to provide feedback … that might lead to redesigning the curriculum or enhancing the student experience." That's what led to the current structure of EAP's capstone course. In it, small, interdisciplinary student teams are paired with private sector clients to work on real-world projects: like creating energy kiosks at Free Little Libraries for the City of Madison or detailing the potential of renewable gas for the Minnesota Department of Commerce. "Tracey and I, with input from Paul Wilson and Greg Nemet, viewed [the capstone] as the foundation for redesigning and expanding the EAP model," Rudd says. "Relationship building was, and is, key to EAP's success."

Since then, enrollment in the program has more than doubled, becoming far and away the most popular graduate certificate on campus. And as far as Rudd's concerned, the program is a shining example of just how impactful interdisciplinary work can be. "It can be the leading edge for what this university wants to do — but doesn't realize it yet — in terms of interdisciplinary work," he says. "You want to break down silos, you want to look for an example of how to connect with the private sector, amplify your students' learning experience? Look at EAP." Or, perhaps, just look to Rudd.

Rudd and his mentee, Younjoo, who has become part of the Rudd family.

From the Blue Ridge Mountains to Big Sky Country, Rudd has spent his life outdoors.

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