Nelson Institute for Environmental Studies
UNIVERSITY OF WISCONSIN–MADISON

**March** 2024

# THE COMMONS

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

## *A Fight against Blue Green Algae*

*Nelson students help Wisconsin's Lake Altoona stay open for business.*

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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.

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# From the Dean

Greetings, Nelson community,

I hope you're enjoying spring (or fall, depending on what side of the globe you're on). Here in Madison, we saw a harbinger of spring much earlier than expected with the thawing of Lake Mendota. Data from the State Climatology Office shows that it was the second shortest freeze on record; Lake Monona had its shortest freeze ever. (Speaking of the climatology office, head to page 15 to meet Bridgette Mason, its new assistant state climatologist.). If you're not freaking out a little, I salute your inner calm.

Watching our lakes open up under sunny skies and 70-degree temperatures in late February made for an easy eco-anxiety spiral. In moments like these — yes, we *have* to acknowledge the grave reality of our present, and consciously adapt to our future — I find genuine comfort in my Nelson Institute comrades. When reading this issue of the *Commons,* I couldn't help but be reminded of our state's motto: *Forward.* To me, this collection of stories demonstrates how folks in the Nelson Institute community are continuously in forward motion, advancing critical research, forging new partnerships and collaborations, and making real, concrete change to help our planet.

It only takes a quick skim of the page opposite this one to see Nelson's far-reaching impacts, but here's the rundown (though you'd be better off reading the full stories!). We're supporting a new structure near Picnic Point which will not only improve the area's natural habitat but will create a new space for community building and education. And oh, yeah, it'll be the *first* net-positive energy building on campus. We're also building a collaboration space through our Sustainability Research Hub, which will bring fresh, large-scale grant money in the door to support some of the most innovative sustainability-related research here at UW–Madison. This is a research incubator and accelerator that Nelson supports for the benefit of the whole campus, from engineering to English, agronomy to anthropology. (Meet members of the Hub on page 20 and see the range of sustainability experts on page 18.) Speaking of innovative research, we're working to stem the tide of species extinction by turning to genetics as a conservation tool. We're also addressing species we *don't* want to be around, like the blue-green algae that's infiltrating Wisconsin's lakes — including picturesque Lake Altoona in Eau Claire County.

To sum it up: yes, conditions are alarming. But I know that each of you reading this shares my hope for the future and are out there *doing the work* in your daily lives, whether you're working in a lab, at an environmental organization, or out in your garden supporting local pollinators. From faculty to students to alumni to friends, the Nelson Institute community is truly something special. (And I hope you're able to join us next month to celebrate our community at the first annual Earth Fest, a weeklong celebration of the environment and sustainability!).

As always, I appreciate your thoughts and feedback on our efforts.

Be well,

**Paul Robbins**
Dean, Nelson Institute

# Net-Positive Preserve

UW–Madison is about to get its first net-positive energy building thanks to a $14.3 million gift from Jerry Frautschi and his family. Planned for the area outside of Picnic Point's iconic stone wall (pictured above), the Lakeshore Nature Preserve Frautschi Center will create a much needed gathering place. "UW–Madison is a steward of a huge range of land resources, research stations, buildings and properties, but none are so iconic, publicly loved and universally experienced as our lakeshore," says Paul Robbins. "A new center at the Lakeshore Nature Preserve will create unprecedented opportunities for community engagement and public education." *Photo by Jeff Miller, University Communications*

# UW–Madison launches Sustainability Research Hub

*The Hub will accelerate transformative research and bring together new interdisciplinary teams.*

Photo by Bryce Richter / UW-Madison

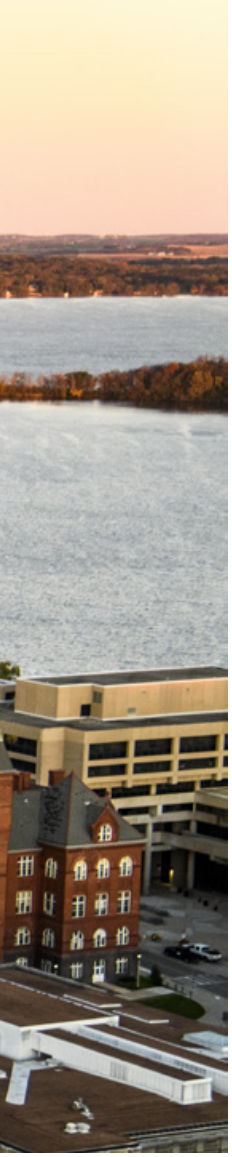
In early February 2024, University of Wisconsin–Madison Chancellor Jennifer L. Mnookin announced a new cross-campus initiative focused on environmental sustainability, centered on five goals. Now, in keeping with those goals, the university has launched the Sustainability Research Hub, a new service to campus that will make the university a preeminent destination for sustainability research and education.

The Hub, which is jointly administered by the Nelson Institute for Environmental Studies and the Office of Sustainability, aims to bring significant interdisciplinary sustainability research funding to campus by connecting researchers across departments and targeting major federal research grants.

"The breadth and depth of sustainability research on this campus — from engineering to agronomy, and from history and art to chemistry and geosciences — is remarkable," says Paul Robbins, dean of the Nelson Institute. "But the challenges of coordinating all this talent, the effort required to produce the synergies needed to be competitive, and the expertise to turn all that talent into major, highly competitive, multi-million-dollar grants: those are things that the Hub can address."

Matt Ginder-Vogel, the associate director of Sustainability Research and Innovation who will lead the Hub, notes that its services aim to alleviate financial and administrative barriers to collaboration and coordination: "We believe the Hub will appeal to a wide range of researchers, from those accustomed to writing major grants to those who are emerging in their fields."

By facilitating innovative research through major federally funded grants, the Hub will create opportunities for undergraduate and graduate student research in sustainability, with the goal of supporting the next gener-



ation of researchers. The Hub also seeks to facilitate research that promotes collaboration with facilities staff and advances the student experience at UW–Madison.

"As Wisconsin's flagship institution and one of the top research universities in the world, we have a responsibility to serve as leaders in sustainability and demonstrate our commitment as environmental stewards," Mnookin says. "With the launch of the Sustainability Research Hub, we are building on our strong foundation in sustainability research and education by leveraging the talents of our faculty, staff and students to do even more."

UW–Madison has produced substantial sustainability-related research in recent years, including nearly 1,200 grants supporting $130M in research and development expenditures during fiscal year 2022. The Hub seeks to catalyze a significant expansion in this research at a time when sustainability insights and solutions are in high demand across many sectors, from governments to corporations.

Holly Gibbs

Paul Robbins

Matt Ginder-Vogel

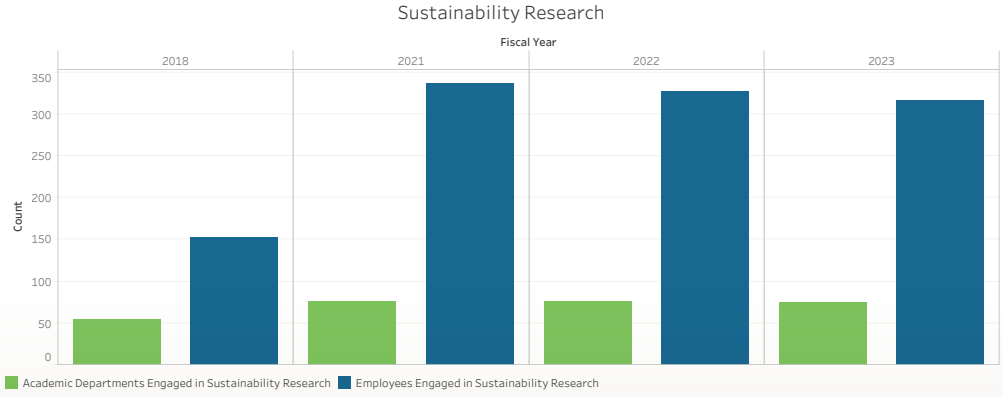
"By investing in administrative human talent–grant writers, matchmakers, project and award coordinators, we are empowering scholarly talent and leveraging it to do something far bigger than we are achieving today," says Robbins. "This is about making a big leap."

Holly Gibbs, a geographer with the Center for Sustainability and the Global Environment, says the Hub will bring together new teams of researchers and "accelerate our capacity to get the funding needed to implement our ideas."

Gibbs leads a team of more than 25 scientists, students, and staff analysts that studies tropical deforestation in the Brazilian Amazon and solutions for sustainable supply chains, with research that has informed government, NGO, and company policies.

"The Hub will power the types of transformative collaboration that are easy to dream about but hard to put into action," Gibbs says. "It will allow us to leave the space where we have grown comfortable and provide the support to take more risks, join more campus-wide research teams, and dig deeper to find the solutions needed by our planet."

Sign up for sustainability-related updates or reach out with projects via the new Sustainability Research Hub website.




According to the Office of Sustainability's dashboard, more than 300 faculty and staff members from 75 departments across campus are actively engaged in sustainability-related research. The Hub helps these researchers make connections to bolster their work and funding opportunities. Graph by Sustainable Research Hub

# Beyond *Jurassic* Park

## *UW researchers say it's essential to biobank animal DNA now to protect species before they face extinction.*

By Sandra K. Barnidge | This article was reprinted with permission from *On Wisconsin* magazine.

*"How do you prioritize [conservation] from an ethical perspective? … We started working with Aldo Leopold's land-based ethics of preservation."*

— Francisco Pelegri

The Great Lakes are home to more than 1,000 native species of water-dwelling animals, from microscopic water fleas to the mighty lake sturgeon that can weigh hundreds of pounds. The count is hundreds more when combined with the region's bird populations and land-based species, such as flying squirrels, white-tailed deer, black bears, and recovering populations of eastern wolves, to name only a very few.

Thanks to the proximity of major research universities like the UW, the five Great Lakes comprise one of the most studied and documented watersheds in the world. Yet even with so much attention from scientists and conservationists, animals in and around the Great Lakes are facing increased pressure from climate change, pollution, invasive species, and habitat loss due to land development.

The Kirtland's warbler (above) and the American pine marten (below) are two of the candidates for a Great Lakes biobank that will store animal DNA to stave off species decline. Photo by iStock

It's a not-so-slow-moving crisis, and the environmental catastrophe in the Great Lakes is part of the ongoing, massive

Francisco Pelegri, a genetics professor in the College of Agricultural and Life Sciences, eyes some dwarf danio fish, which are similar to zebra fish. His lab uses them for genetics research to help regenerate endangered species. Photo by Bryce Richter

decline in animal species worldwide, with two million species at significant risk of extinction, according to the latest analysis by the United Nations. The situation has inspired UW researchers to explore a new way to stave off biodiversity loss in Earth's largest freshwater ecosystem: a large-scale genetic biobank that could store animal DNA for decades, ideally without relying on subzero refrigerators.

Along with developing the new technologies to make a biobank of this scale possible, UW researchers are also pioneering an ethical approach to animal DNA collection that will prioritize Indigenous community partners from the very beginning of the process. This combination of innovative science with a commitment to environmental justice is poised to fundamentally impact the emerging field of conservation genetics, which applies scientific tools to stave off species decline and extinction.

**Take That to the (Bio)Bank**

"Right now, we're in a stage where we are very reactive when it comes to biobanking," says genetics and medical genetics professor Francisco Pelegri, who is leading the new biobank initiative at the UW in close partnership with Paul Robbins, the dean of the Nelson Institute for Environmental Studies and a professor of environmental studies and geography.

Currently, conservation geneticists tend to focus on projects that aim to bring species back from functional extinction, such as an effort in Kenya to save the northern white rhinoceros. Researchers there are creating embryos from the few remaining northern white individuals and implanting those embryos into female southern rhinos. While these techniques could succeed in bringing back several northern whites, Pelegri says that in these cases, even if the resulting offspring survive, there still may not be enough genetic diversity left to build a healthy population long-term.

Photo by iStock

In populations that aren't genetically diverse enough, the negative effects of inbreeding can occur within just a few generations. To prevent this, he says, a species needs at least 50 individuals (none of them clones). But that would only prevent immediate problems. To ensure genetic diversity over time, a population needs at least 500 individuals, and ideally 1,000 or more. That number is much higher than emergency efforts can produce — efforts such as the ones designed to save near-extinct species. The Tasmanian devil, the vaquita porpoise in the Gulf of California, and the Yangtze River dolphin in China all have only a few dozen individuals left, at best. When populations drop to such a severely low level, the species enters what's known as the "extinction vortex," where additional reproduction simply hastens the genetic consequences of inbreeding.

"Going forward, what we want is to be more proactive, where you basically have a lot of samples ahead of time while we can still find them," Pelegri says. "This is why it's important to biobank now."

That's one of the core lessons about bio-conservation that Pelegri emphasizes both in the lab and in the classroom. In 2015, he launched an undergraduate course called Developmental Genetics for Conserva-

tion and Regeneration that offered an optional spring field trip to Costa Rica to give students some active experience with bio-conservation projects. Four students enrolled in the pilot semester, but by 2020 the demand had grown to almost 100 students, and Pelegri began to teach the class year-round. Word also spread among faculty members, including Robbins.

Robbins is a senior fellow at the Breakthrough Institute, an environmental research center based in Berkeley, California. Through the institute's network, he met the geneticists who made headlines in 2021 by successfully cloning a black-footed ferret from 30-year-old frozen cells. The work reintroduced a genetic lineage to a "perilously narrow" species, and it inspired Robbins to explore how traditional conservationists like him could work alongside geneticists on high-impact, high-profile projects.

"The more I asked around, the more I realized there were already people hard at work thinking about this in Madison," Robbins says. "When I suddenly realized the UW was in a leading position on this topic, as a dean of an institute that's supposed to help people coordinate, I got excited."

Robbins reached out to Pelegri to team up on a biobanking grant from the UW2020 initiative, which aimed to reward high-risk research ideas. The grant was originally connected to work Pelegri had planned for upcoming trips to Costa Rica with undergraduate students to collect blood from mosquitoes as an indirect way to gather DNA samples from various protected species, which are otherwise mostly off-limits to sampling. But when the COVID-19 pandemic halted university travel, the biobank partners began to think about research opportunities closer to home.

"One of the things we were thinking about was how do you prioritize [conservation] from an ethical perspective?" says Pelegri. "We started working with Aldo Leopold's land-based ethics of preservation."

In *A Sand County Almanac, Leopold*, the former UW professor and legendary conservationist, argued that

Pelegri has posted photos of endangered species in his office as a reminder of what's at risk if we don't prioritize animal conservation. Photo by Bryce Richter

humans have a moral responsibility to the natural world and are uniquely called upon to care for the land and develop strong relationships with all parts of the Earth.

Gradually, Pelegri and Robbins turned their attention north toward the Great Lakes Basin and to the possibility of biobanking all of the animal species there. They've also begun to build a cross-campus coalition of UW faculty from a wide range of disciplines to draft grant applications and explore other opportunities to start moving the Great Lakes biobank forward.

Wood turtles have suffered substantial declines in the last century. Photo by iStock

**No Freezer? No Problem**

The concept of animal biobanking sounds not so different from the large-scale plant seed banks that are now cropping up at universities around the world in an effort to protect native and endangered species for the future. Yet storing animal DNA for decades is far more complicated and costly than storing plant seeds. Existing biobanks hold tissues for decades in subzero freezers, which is a lot of time — there may be accidents, power outages, political instability, or human errors. Last summer, a freezer was mistakenly turned off at Rensselaer Polytechnic Institute in New York, and 25 years of animal cell cultures were lost overnight.

Keeping samples at subzero temperatures is also expensive, which tends to limit the kinds of research facilities that are able to work with tissues that require cold storage. "If you walk through any lab complex, you're going to see loads of freezers and refrigerators, and we assume that's essentially just the cost of doing business," says biomedical engineering professor William Murphy, who is one of the primary collaborators on the biobank initiative. "But if there were alternatives [to subzero freezers], they could be quite transformative."

For the UW2020 grant, Murphy's and Pelegri's labs partnered to explore several projects related to the challenge of preserving organic tissues long-term at room temperature. In particular, they studied the genetic profile of tardigrades, the highly resilient micro-animals that have the remarkable ability to desiccate themselves for long stretches of time and then rehydrate and carry on with no obvious effects on their health. Additionally, both labs are looking at model organisms such as zebra fish to study various gene transplant techniques.

Currently, Murphy is focused on work inspired by nature's most effective form of extremely long-term storage: fossils. "What we're mimicking in nature is the ability of fossils to stabilize biological molecules," he says.

For the past few years, Murphy's team has been generating a library of almost 100 minerals they can produce in the lab, and they've screened each one to identify whether and how it can work to stabilize biological molecules. For instance, Murphy sees potential in a class of fossilized minerals called calcium phosphates, which are the same kinds of minerals found in bones and teeth. The minerals can be useful as stabilizers of the proteins, DNA, and RNA that will form the building blocks of biobanked species. Recently, they've also been combining mineral ions with strands of therapeutic RNA, the same type of RNA used in COVID-19 vaccines. "We've been able to identify materials that stabilize the RNA for several months, even at room temperature," he says.

It's the first step on a long road, but it could have benefits beyond biobanking, making it possible to stock laboratories, hospitals, or even airplanes with "freeze-dried"

biological tissues for a wide range of human medical uses (see sidebar).

**You Don't Biobank Somebody's Family without Asking First**

While some collaborators, like Murphy, focus on the groundbreaking technologies needed to make the biobank possible, Robbins is leading the conversation on how to ensure that the application of these innovations balances with broader ethical considerations.

"People need to know that we aren't going mad scientist on this," says Robbins. "This is a very deliberate, very thoughtful, publicly engaged exercise that starts by listening, for example, to the tribes [in the Great Lakes region]."

More than 80 percent of the world's biodiversity is thought to be on lands that belong to or are actively managed by Indigenous communities. In the Great Lakes region, several tribes have federally protected co-management authority of certain areas. That means scientists like the UW biobank partners not only should consult Indigenous partners on decisions related to sampling, storing, and using genetic materials from species on those lands — in many cases, they legally must.

The Karner blue butterfly and whooping cranes (opposite) are among the species facing threats from habitat loss, pollution, climate change, and other factors. Photo by iStock

To that end, Robbins and Pelegri recently coauthored a journal article, along with Hilary Habeck Hunt and Jonathan Gilbert, the biological sciences director at the Great Lakes Indian Fish and Wildlife Commission, which is the agency responsible for protecting the hunting, fishing, and gathering rights of 11 Ojibwe tribes across Minnesota, Wisconsin, and Michigan. Titled "Sovereign Genes," the article was recently published in Frontiers in Conservation Science and outlines a set of principles for collaboration between scientists and Indigenous communities to employ genetic tools responsibly in wildlife conservation.

"The serious, historic mistakes made in human genetic biobanking and the way in which those efforts harm[ed] Indigenous communities provide lessons that can be used to plan for wildlife biopreservation in approaches that are responsible, respectful, and potentially collaborative," the paper states, referring to poor practices by scientists in the past related to informed consent, compensation, and tribal sovereignty, among other issues. "By honoring Indigenous sovereignty and community autonomy, and by working to create or leverage existing formalized agreements, powerful genetic toolkits can be brought to bear in the protection and preservation of species of cultural and conservation significance."

Robbins says that this unequivocal commitment to not only listening but also showing genuine deference to Indigenous partners is crucial to the biobank's ultimate success. "Will it be fraught? Yes. But this is an opportunity for tribes to exercise their rights," he says, adding the hypothetical example of someday obtaining DNA samples from wolves in ceded Ojibwe land in central Wisconsin. "For them, the wolf is kin. You just don't go biobanking somebody's family without asking them, especially in ceded territories where they have management rights. By talking to them, we hope to introduce this topic in a sensitive way."

In time, Robbins and Pelegri also anticipate biobank-related collaborations with other major American and Canadian universities throughout the Great Lakes region. Yet they agree that UW's deep talent pool across multiple disciplines — from biomedical scientists and engineers to bioethicists, historians of science, and communication researchers — make it likely that Madison will emerge as the leading regional hub for conservation genetics in the coming years.

"The UW is so good at everything it's going to take to do

Photo by iStock

this right that we have a responsibility to lead," says Robbins. "We can't afford to wait for other people to do it wrong."

For Pelegri, the moral imperative of the biobank is also closely tied to the role of humans in climate change and biodiversity loss. When we think about "fixing" human-induced species loss, we often think in terms of de-extinction efforts. He cites new efforts to revive the passenger pigeon, once the most abundant bird species in North America, which died out in 1914 after a few decades of excessive hunting and habitat loss. Yet instead of looking backward at what we've lost, Pelegri says, "it's important to change the narrative and say, [conservation genetics] technology is not just for that. In fact, it's probably going to be more important for keeping alive what we have right now. … Anything can become extinct.

"If we can preserve genetic diversity now, then if we ever notice that a living population is being affected in the future, we can actively reintroduce that diversity to keep it healthy," says Pelegri. "And it's not just for that population — it's for an entire ecosystem, because everything is related."

An entire ecosystem like the Great Lakes, for example. And from there, Pelegri hopes to see a global network of interconnected biobanks that offer an extra layer of protection for animal species everywhere.

## Saving Animals, Saving Humans

Finding a way to preserve animal biobank samples without subzero freezers could also have major benefits for human health care.

For example, storing the materials for stem cell therapy to treat cancer requires expensive liquid nitrogen freezers that can be out of reach for underdeveloped nations.

"My dream," says biomedical engineering professor William Murphy, "would be that these approaches [to storing biological materials without specialized freezers] would make new medical therapies available, accessible, and functional for everyone in the world, especially the emerging cell and genetic therapies that are right now accessed only by wealthy societies."

One focus of Murphy's research involves studying how fossils occur in nature. "If a certain type of protein is in the human bloodstream, it might be stable and functioning for minutes to hours," he says. "But that same protein, if it's present in a biological fossil, might remain intact for centuries or even millennia."

Although Murphy's work is just getting started, it will become more important over time, he says, as more therapies requiring preserved biological materials are being developed and approved.
— S.K.B.

Feature

# Putting the *Clear* Back in Eau Claire

## *Nelson Institute students offer an action plan for Lake Altoona.*

By Abigail Becker, UniverCity Alliance

**Located at the nexus of the Eau Claire River watershed, Lake Altoona is a destination attraction for swimming, boating, and fishing. But in 2023, there were 71 days when bacteria or algae affected the beach.**

A group of Nelson Institute students in an accelerated project-based master's program aims to change that by implementing environmental conservation strategies they recommended after holistically studying Lake Altoona. "The process involves looking at all of the contributing factors that impact the water quality," said Shannon Roznoski, who is in the environmental conservation MS program. "We mapped out all the threats, which do include nutrient runoff, sedimentation, bacteria levels, harmful bacteria that comes from various sources and does lead to algae blooms."

The students were connected to Eau Claire County through UniverCity Alliance, which is a network of inter-disciplinary leaders dedicated to fostering innovation in Wisconsin communities of all sizes. Eau Claire County is partnering with UniverCity through 2025 and connecting with university resources to address challenges like re-curring algae blooms in Lake Altoona that can be harmful to human and animal health. Additionally, the students worked in collaboration with representatives of the Eau Claire River Watershed Coalition to create a conservation action plan for Lake Altoona.

Lake Altoona is a conservation target because the Eau Claire River (shown here) Five Mile Creek, and numerous springs within the watershed flow into it, reflecting the overall health of the watershed. Photo by Megan Zabel Holmes / Visit Eau Claire

Matt Steinbach, the environmental sciences division manager at the Eau Claire City-County Health Department, said the students were "very eager to learn about the situation and provide practical solutions for Eau Claire County to implement." Steinbach added, "This partnership provided a unique opportunity for the county to prioritize this project and for the students to gain collaborative experience working on a complex problem."

While environmental issues can be "spoken of on a grand, existential level," program coordinator Meghan Kautzer said the opportunity to work with Eau Claire County focused the students' work. "By working with Eau Claire County, students are steeped in the importance and direct impact of focusing on the local, community level," Kautzer said.

The environmental conservation program, which includes a total of 22 students who will complete the program in August, fits well with UniverCity's model of pairing a community-based project with coursework because it "embraces putting science to action," Kautzer said. "Conservationists must be equipped to effectively, positively work with people that are impacted by environmental challenges," Kautzer added. "Classroom training can only go so far to introduce the complexities (and joys) of working with people. An immersive experience with a community-based project allows students to see conservation science come to life, to face the realities the community faces, and work together to problem-solve."

After working with 35 communities on more than 300 projects, UniverCity Alliance managing director Gavin Luter can attest that community-based projects provide enhanced learning experiences that result in the students gaining a better understanding of what is taught in the classroom. "What makes the UniverCity model so impactful is that it prioritizes two-way learning," Luter said. "Wisconsin communities are receiving helpful projects from students, and the university is learning from local knowledge in communities."

*Scientific inquiry is meant to build knowledge. We need diversity in perspective, experience and passion to creatively bring this knowledge to life.*
*— Meghan Kautzer*

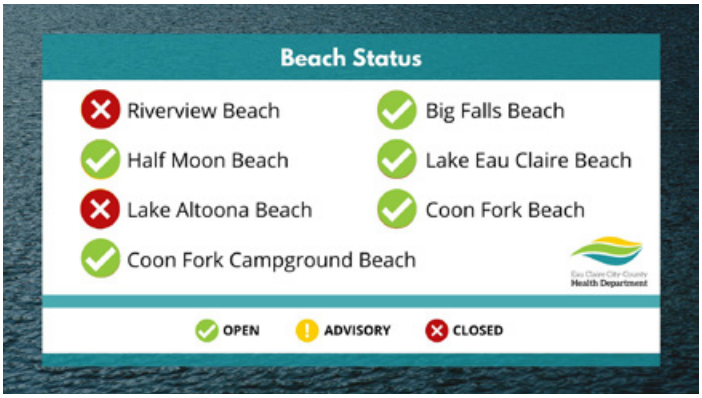
**Recommended Strategies**

Lake Altoona is a conservation target for the community because the Eau Claire River, Five Mile Creek, and numerous springs within the watershed flow into it, reflecting the overall health of the watershed. It's also the lowest point in the watershed and receives nutrients and sediment that has accumulated throughout the Eau Claire River's tributaries.

Ultimately, the students recommended implementing a sustainable landscaping awareness campaign and hiring an Eau Claire watershed coordinator. They hope that these primary strategies will reduce the number of days when beaches are closed and the amount of sedimentation that builds up in the lake.

The focus of the sustainable landscaping awareness campaign is to mobilize lakeshore property owners to implement best practices for reducing runoff into the lake. It would include developing educational materials, promoting and conducting one or more two-hour workshops, and monitoring the implementation of sustainable landscaping practices before and after the campaign.

"There's a community that is very concerned about the health of the lake, and one of the things that was desired was to get them more involved with actually taking care of the lake," environmental conservation MS student Ian Henery said. "Our strategy is essentially an outreach mission to inform them of the more sustainable landscaping practices." These practices, which can include reducing fertilizer use and incorporating diverse vegetation, would reduce the stress of increased sedimentation and harmful algae on Lake Altoona.




An Eau Claire City-County Health Department notice from Aug. 15, 2023 shows that Lake Altoona is closed. Graphic courtesy of Eau Claire City-County Health Department.

Hiring an Eau Claire watershed coordinator, the second strategy, was previously identified as a need by the Eau Claire River Watershed Coalition but has not been implemented. There's currently no staff dedicated to coordinating activities, communication, and priorities across the watershed. "The watershed spans across five counties besides Eau Claire. We're essentially mobilizing a lot of the different actors within the area, especially agriculture because they're the largest contributor to sediment and nutrients," Henerty said. "The idea is to have someone that can be almost like a spokesperson for the entire watershed and a facilitator."

As the group was developing recommendations, Roznoski said they kept in mind all the work conducted by community groups over the years and considered where they could add value. She highlighted justifications for how a coordinator can benefit the watershed and researching objective measurement techniques that community-based organizations can implement as examples.

Steinbach said the group's recommendations, which ranged in cost, were well received by the local partners. "It was obvious that the group heard the feedback provided throughout the process," he said. "I expect these recommendations to be a big part of planning efforts for the watershed coalition and Eau Claire County in future years."

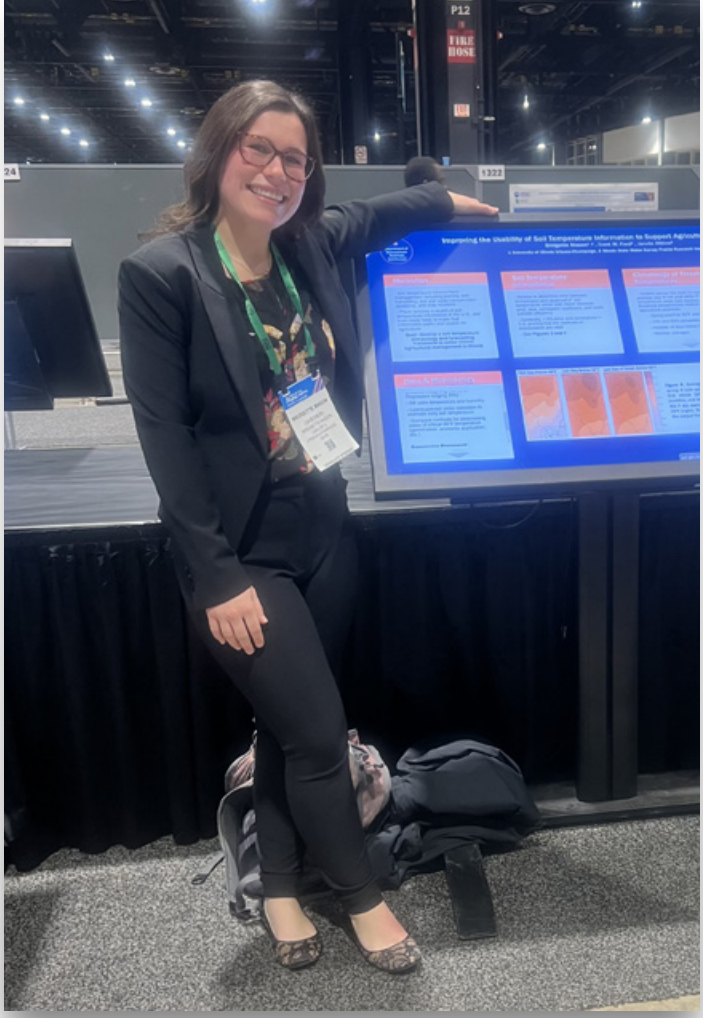
**"Brighter Environmental Future"**

For Roznoski and Henery, the environmental conservation program has provided a path forward into new careers. Roznoski is transitioning into conservation from a career in information technology for 24 years. After volunteering in state natural areas about six years ago, she realized her passion for restoration work and conservation. She said having the opportunity to work with professionals in county health and land conservation through this project was very beneficial.

"I learned a lot about how county-level government is structured," Roznoski said. "Getting more insight and a better sense of how these different organizations work together gave me a nice introduction into some of these areas that I don't have a lot of experience with."

Henery, who previously worked for Trek Bicycle, said he found the environmental conservation program online, "took a chance," and moved to Wisconsin. Having grown up in Florida, Henery developed an interest in freshwater ecosystem conservation and is planning to combine that with working for an environmental protection group. Though Henery would like to work on a federal or state government level, the experience of partnering with Eau Claire County was "very necessary for my understanding of what I want to do in my career," he said. "It was just a fantastic representation of what's necessary in order to mobilize people and ideas towards a goal."

Kautzer said the variety of student backgrounds contribute to addressing challenges that face the conservation field. "Scientific inquiry is meant to build knowledge. We need diversity in perspective, experience and passion to creatively bring this knowledge to life," Kautzer said. "As an interdisciplinary institute, we believe every individual has a role in contributing their unique talents and abilities, to overcome these obstacles for a brighter environmental future."



# Meet Wisconsin's New Assistant State Climatologist

## *Bridgette Mason rounds out the new team at the Wisconsin State Climatology Office.*

By Dea Larsen Converse,
Wisconsin State Climatology Office

Bridgette Mason has been named the new assistant state climatologist for the Wisconsin State Climatology Office (SCO).

"I'm excited to serve as assistant director to the recently funded office. I'm passionate about the office's mission of providing new and expanded climate services to support Wisconsin communities," says Mason.

Mason has a bachelor's and a master's degree in atmospheric sciences with an undergraduate minor in crop and soil management. Her undergraduate capstone research examined how severe convective systems and climate conditions impact crop vulnerability and damage during the growing season. Her graduate work focused on developing an extensive soil temperature climatology to support agricultural decision making.

Mason has been a climate-smart agriculture fellow at the USDA Midwest Climate Hub since August 2023, researching climate change impacts on cropping systems in the Midwest and developing outreach materials to support state and regional groups. She also brings experience working with environmental datasets to support stakeholder decision making, including using weather and phenology data to help prevent frost damage in grape cultivars and investigating historical and projected climates to more accurately estimate agricultural emissions.

"Mason's background working with rural communities and agriculture stakeholders to communicate weather and climate information will be a welcome addition to the office. We are looking forward to having her as part of the team," says Steve Vavrus, the new state climatologist and director of the Wisconsin State Climatology Office.

The Wisconsin State Climatology Office provides data on the state's climate and weather to stakeholders statewide. As part of the UW–Madison's Rural Partnerships Initiative, the SCO recently received funds to revamp and expand support to rural and tribal communities. The SCO partners in this work with the Wisconsin Environmental Mesonet (Wisconet), directed by plant and agroecosystem and environmental studies professor Chris Kucharik.

Read an extended version of this story online.

# Cultivating Connections

*A partnership between UW research and Indigenous knowledge helps feed Wisconsin's Tribal Nations.*

By Laila Smith

Erin Silva (far right) talking with staff and students about organic agriculture. Right: Erin Silva presenting at an Organic Agriculture Research Field Day at the UW Arlington Agricultural Research Station. Photos by Anders Gurda (3)

Erin Silva's office may be on the University of Wisconsin –Madison campus, but her current work extends to Tribal Nations across the state. Silva and a few graduate students are collaborating with the Ohe·láku, a nonprofit organization of Oneida families, and other Tribal partners to promote food sovereignty and security across Wisconsin's Indigenous Tribes.

As an undergraduate, Silva studied biology and chemistry at the University of Wisconsin–Stevens Point before pursuing a PhD in horticulture at Washington State University. While pursuing her undergraduate degree, Silva worked at several UW–Madison labs that focused on agricultural research, which piqued her interest in combining her education in ecology and the environment with horticulture and food production.

Silva further meshed these concepts at Washington State, where she worked on a project that focused on understanding pollinator behavior. "I liked how I was able to implement my background in ecology and the environment into an agricultural setting," says Silva. After graduating with her PhD, Silva worked at New Mexico State University where she was able to expand on her interest of bringing ecological concepts into organic agriculture education.

In 2006, Silva returned to Wisconsin to accept a position as an organic researcher with UW–Madison's College of Agricultural and Life Sciences (CALS). Since then, she has expanded her roles and is now an affiliate of the Nelson Institute for Environmental Studies, a professor and state extension specialist in organic and sustainable cropping systems in CALS's Department of Plant Pathology, and a director for the college's Center for Integrated Agricultural Systems.

To Silva, the Nelson Institute's focus on environmental studies, land ethics, and the integration of interdisciplinary approaches is what really sets it apart. "I was drawn to how the Nelson Institute brings in faculty across various disciplines and stresses the importance of interaction between the biophysical aspects of land management with the social and community side of how those decisions are adopted on the landscape," she says.

Silva continues to be involved in projects that emphasize how academic research can be applied within communities. To Silva, "being a land-grant university means that we should be aligning with and uplifting the Wisconsin Idea by working across the Wisconsin landscape." In her agricultural work, Silva is deliberate about working directly with farmers, involving the community in research, and listening to people's observations and needs.

Recently, Silva and her graduate student, Daniel Hayden, have been applying these interdisciplinary concepts to a research collaboration with the Ohe·láku. The group is hoping to develop a more intentional approach to growing corn – one that aligns with their traditional production of corn and the ecological knowledge that accompanied it. They're also trying to bring back some of the historic varieties of corn that the Oneida Nation once grew.

Silva refers to this partnership as a "codeveloped grassroots effort" that began as a conversation about how UW–Madison's organic agricultural research can help meet some of the needs and goals of the Ohe·láku. This project has contributed to the blending of Traditional Ecological Knowledge with modern organic practices, helping to support the Ohe·láku's traditional corn production and their food sovereignty goals. Silva also says that all of the food being produced during research and in the research plots is being distributed back into the community. "Through this project, we're not only bringing back the precolonization historic Tribal foods that support the health and well-being of Tribal members, but also putting food into the homes of people who need food security support," she says.

Soil sampling at the UW Arlington Agricultural Research Station.

Moving forward, Silva hopes that the food sovereignty partnership between UW–Madison researchers, the Ohe·láku, and other Tribal Nations continues to thrive. She says, "I want us to be able to enhance the student experience of colearning, both by providing opportunities for Tribal students to learn and explore at UW–Madison and by providing UW–Madison students with opportunities to see the power of cogenerating knowledge and listening to the communities we're working with."

# Writing Science for the Public — In Action

*LSC561 students write feature stories on UW–Madison experts for the Sustainability Experts Database*

By Anica Graney

Photo by iStock / slexp880

"For UW–Madison to be sustainable, it must become a living model for sustainability, integrating all facets of the process into its culture, its purposes, and its practices."

This quote, found on the Office of Sustainability (OS)'s website, is the inspiration for many of the sustainability-related projects on campus — including the new Sustainability Research Hub and Sustainability Experts Database.

It is also inspired by the devotion of UW–Madison students, who are key advocates for sustainability on campus. "Campus is a living, learning laboratory," said Marek Makowski, graduate project assistant with the OS. "Students should have an effect on how the university is being operated, not just theorizing about sustainability, but actively applying it — which connects to the Wisconsin Idea."

Makowski wanted to make it easier for students — as well as others at UW–Madison — to work with the hundreds of sustainability experts across campus. As a journalist and doctoral student in the English department, he was also devoted to using writing as a tool for addressing sustainability.

To make this idea a reality, Makowski teamed up with Madeline Fischer, instructor of Life Sciences Communication 561: Writing Science for the Public, to create a project for her students that would help them learn how to craft polished writing for a public audience while also helping improve campus's sustainability efforts.

With support from Fischer and Makowski, LSC561 students interviewed campus experts and developed feature stories, or profiles, that were eventually published on the Sustainability Experts Database website. "The profiles allow people to engage with the breadth of experts we have on campus and hopefully inspire future research or contributions," Makowski said.

The Sustainability Experts Database also supports the newly unveiled Sustainability Research Hub by providing a contact list of experts across UW–Madison, which Hub

This project supports the OS's goals of creating cross-campus involvement and fostering educational experiences. In a boarder sense, the profiles will be a springboard for students, campus researchers, and community members to learn more about the kinds of research happening on campus.

Matt Ginder-Vogel, director of the Sustainability Research Hub, agrees. "We're trying to put ourselves in a position where we know as much as we can about the types of sustainability research happening on campus, and then point people in the right direction and help get grants out the door," he said. "I think we're uniquely positioned in that we work across campus and have the opportunity to see the breadth of what's happening across the university."

The spring 2024 LSC561 class will continue to write feature stories for the Sustainability Experts Database as Makowski works with the new cohort of students and new instructor of the class, Hannah Monroe.

To read the published profiles, including those on the Nelson Institute's Adrian Treves, Rebecca Larson, Tracey Holloway, Sean Schoville, visit the Sustainability Experts tag on the Office of Sustainability webpage.

staff use to connect researchers and pursue interdisciplinary grants.

LSC561 students who took the course in the spring of 2023 were assigned to interview an expert about their background, research, and what motivates them to continue their work. The students then wrote feature stories which went through a few rounds of revision before being published.

"I always tell my students that if they want to become communicators, they need examples of their work. It doesn't really matter so much where they get published, but just that they have been published in some way," Fischer said. "There was some hesitation — some nervousness — at the beginning of the project, but by the end, the students were really grateful for the experience and got a lot out of it."

# 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 the Sustainability Research Hub team.*

As part of the recently announced campus sustainability goals, Chancellor Jennifer Mnookin introduced the Sustainability Research Hub which exists to support the growth of cross-cutting sustainability research. We are excited to introduce the Hub team who are ready to help identify collaborators; draft and assemble large scale proposals; and provide research administration support. A scientific illustrator will be hired this spring to provide graphics support for proposals.

**Matt Ginder-Vogel, Director**
Matt is an associate professor in the environmental chemistry and technology program. Prior to joining the UW–Madison faculty, he was the manager of process and analytical chemistry at Calera Corporation where he led teams that produced cementitious materials derived from industrial CO2 sources. Previously, he worked at the Delaware Environmental Institute at the University of Delaware. He earned his PhD in soil and environmental biogeochemistry from Stanford University.

**Melanie Hebl, Collaboration Specialist**
Melanie works with researchers and departments to identify new opportunities for collaboration and connection in sustainability research. With 16-plus years of experience in research administration at UW–Madison, she's the ideal person to connect the dots across campus. With her experience navigating projects, she understands the many moving parts involved in large proposals and can help overcome challenges that may arise. Melanie has a degree from the UW in conservation and environmental science.

**James Jerden, Sustainability Science Proposal Writer**
James supports UW–Madison researchers in developing world-class sustainability science projects. He is a broadly trained geoscientist and science writer. Before joining the UW, he worked for 18 years as an R&D scientist at Argonne National Laboratory, where he helped develop several large-scale, interdisciplinary projects. James has also worked as a science writer for the nonprofit Remineralize the Earth, authoring articles on nature-based solutions to climate hazards and food security issues. He holds an MS in geology (Boston College) and a PhD in geochemistry (Virginia Tech).

**Elizabeth Runde, Research Administrator**
Elizabeth works across disciplines to help sustainability science teams organize and submit successful collaborative proposals. Elizabeth has been at UW-Madison for 11 years, most recently as a research administrator in the Nelson Institute, following nine years in administration at the Center for Limnology. With roots in field and lab work, she enjoys facilitating research by assisting researchers with the details required throughout the lifecycle of grant administration. Elizabeth has degrees in biological sciences and business administration from Northern Kentucky University.

**Eliza Waters, Sustainability Grant Writer/Coordinator**
Eliza provides support for the writing and management of grants for sustainability research and implementation programs. Eliza previously worked as a grants manager for One City Schools and served as Assistant Director of a large interdisciplinary research program at UW-Madison. As a freelancer, she has provided content and editing in a wide range of formats for academic, nonprofit, and business clients. Eliza received a MS in agricultural and applied economics from the University of Wisconsin–Madison, and a BA in environmental policy from Duke University.

# Director's Cut

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

Hello, everyone! Here's the latest from CHE.

As part of our Year of Environmental Art, we continue to expand our coverage of the diverse ways in which art can engage with the natural world. Following the fall semester, which focused mostly on static, visual art, we've embraced new modalities. Our most recent colloquium, on February 14, explored responses to the natural environment through dance, as Peggy Choy shared a project on human and fungal life. We're looking forward to a panel on music, sound, and the environment (April 24 from 1 to 2 p.m. in Science Hall, room 140), which will serve as CHE's contribution to Earth Fest. Professor Gabby Cornish, an expert on sound in the former Soviet Union, will be joined by CHE graduate associates and fellow musicologists Elijah Levine and Allyson Mills. (While we're on that subject, Allyson is one of a plethora of graduate students to join CHE this academic year. Together, these new recruits represent the full range of the UW community, hailing not just from CHE's traditional areas of strength, such as literary studies and geography, but also from fields such as education, nursing, and theater studies.)

We're finalizing plans to combine the kickoff for Earth Fest with a reception celebrating our new undergraduate and graduate environmental art prizes (April 19 at 5 p.m. at the Wisconsin Institute for Discovery). Read more about the prizes. We'll report back on the competition and the winners in the next edition of the *Commons*. Thanks so much to Tim Portlock for bringing this important new initiative to CHE. Tim will be sharing his own art with us on March 13 (noon–1 p.m. in Science Hall, room 140), before Meg Wilson closes out our 2024–25 colloquium series, by showcasing her groundbreaking work on plant aesthetic preferences (noon–1 p.m. on April 10 in Science Hall, room 140).

In addition, our pioneering, student-run digital publication, *Edge Effects*, has offered its own take on the year's artistic themes with an article on art and environmental protest – on protests that apply (in a literal – i.e., physical – sense) the sorts of consumerist products depicted by Andy Warhol to the hangings of major galleries. Such interventions result in canvases dripping with soup, shocked curators, and much food for thought. You'll find the article, "The Art of Climate Protest," reproduced in this issue of the *Commons*.

I hope you enjoy this as well as our other explorations of art and the environment!

**Will Brockliss**


# The Art of Climate Protest

*A new generation of climate activists draw from histories of protest art to reveal the ties between the art world and fossil fuel capitalism.*

By Jayme Collins

In 2006, one of Andy Warhol's *Campbell's Soup* prints was sold at auction for a record $11.8 million. In those works, Warhol used the quotidian tools of printmaking and reproduction to critique the exclusionary world of fine art and to disclose art's enmeshment in a consumerist culture. Despite their "outsider" beginnings and oppositional intent, the soup can prints have now become fully incorporated into canonical art history and the art market as prized emblems of postwar American art. Soup, though, once again made an iconoclastic splash in the art world when, in 2022, climate activists from "Just Stop Oil" splattered Vincent Van Gogh's famous *Sunflowers* in a viscous layer of red tomato soup. Using soup as a tool for protest in the gallery aimed to draw attention to the ties between the art world and fossil fuel capitalism.

Art auctions regularly draw attention for the exorbitant wealth they display. With attendees like hedge fund managers, high-profile celebrities, and oligarchs, single pieces of art are regularly sold for millions or even hundreds of millions of dollars. Since the 1980s, those valuations have risen rapidly as art has increasingly become an investment machine for the protection and accrual of wealth. The dramatic stores of wealth available for investment in art have increased in step with resource extraction and consumption since 1950, mapping onto a period that historians have termed "The Great Acceleration" to refer to dramatic increases in human activity and their impacts on the Earth's systems.

Enter into this context the environmental activist groups "Just Stop Oil" and "Letze Generation" ("Last Generation"), nonviolent civil resistance groups focused on fossil fuel divestment and sustainable futures for all. In the fall of 2022, when the group staged protests in prominent art galleries and museums across Europe and Australia, museum directors were understandably shocked. Employing direct action methods, protestors marked iconic artworks: mashed potatoes strewn on Claude Monet in Potsdam, tomato soup splashed on Van Gogh in London, blue pen scrawled on Warhol in Canberra, hands glued on Pablo Picasso in Melbourne. The works the protesters targeted are exactly the kind that draws the biggest prices at auction: icons of Impressionism, Cubism, and pop art. While the works were unharmed, their

defacement in the name of direct climate action challenged not only the cultural value of such prized, irreplaceable objects but also the system that preserves, exhibits, and validates their worth.

In the wake of the protests, directors of high-profile museums and art galleries around the world released a joint statement in which they disparaged the protests as stunts that "risked" the "endangerment" of not only multimillion-dollar art, but also the social life and discourse art facilitates. Commentators quickly divided into camps: for some, activists had gone too far; for others, their actions were necessary and timely responses to the severity of the climate crisis. While registering the disruptive effects of the protests, these various responses severed the tactics of the protests from the cultural institutions and expressive discourses of the art they targeted. Failing to register the activists' engagement with the tools of artistic expression misses a crucial point. These protests not just sowed disruption in one realm to precipitate change in another (a frequent activist tactic), but they drew explicit links between the fossil fuel economy and the institutions and markets of the art world.

*The paintings the "Just Stop Oil" protestors targeted are symbols of an economic system that has taken the planet to the brink*

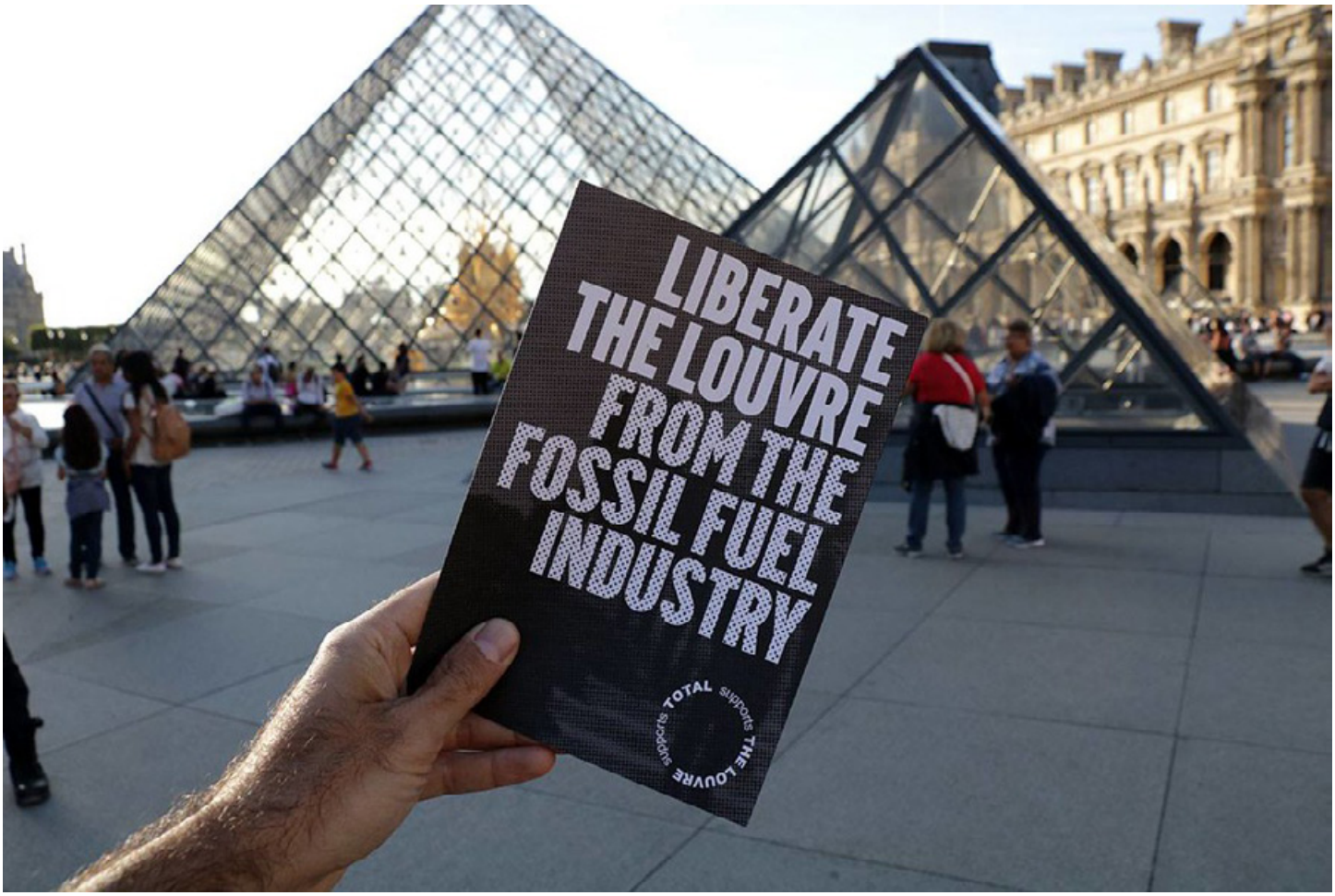
In many ways, that world is a microcosm of a world economic system that has had profound impacts on Earth's geologic systems, quickly making the planet uninhabitable for many. While contemporary art auctions might be an especially conspicuous display of wealth accumulation, the very founding of art institutions has in some cases been closely entwined with the extraction of resources: the renowned Getty galleries and research institutions that dot the globe were founded by oil tycoon J. Paul Getty; New York's Museum of Modern Art was founded by the Rockefellers, who made their fortune through oil; the Guggenheim was founded with wealth amassed through mining; the Metropolitan Museum's "environmentally-friendly" Koch Plaza is inextricably tied to the Koch brothers' support of climate denialism and investment in the tar sands.

Today, many art galleries and allied cultural institutions rely on funding from oil companies, though some have been rapidly divesting. Despite commitments toward divestment over the last five years from many major institutions, even among galleries the protesters targeted, the commodity culture that feeds fossil fuel capitalism by valuing and protecting wealth at the expense of environmental health and justice remains entwined with cultures of art preservation. One protestor drew attention to this cultural impasse, demanding that spectators consider: "What is worth more, art or life?"

The paintings the "Just Stop Oil" protestors targeted are symbols of an economic system that has taken the planet to the brink. In their protest tactics, the activists show how the paintings are objects whose critical modes have been vacated by their incorporation into systems of wealth and prestige. In doing so, the protests arguably seek to revitalize — rather than erode, as the museum directors claimed — the cultural discourses and expressive critiques that spaces of art caretake.

Activists imagine and actively frame their protests as continuations of traditions of anti-capitalist art and cultural critique. After scrawling on Andy Warhol's pop art prints of Campbell's soup cans in Canberra, activist Bonnie Cassen claimed she was continuing in Warhol's own critical tradition. If Warhol was depicting "consumerism gone mad," Cassen said her performance critiqued "capitalism gone mad." Contrary to being an "attack" on art discourse, Cassen's performance participated in the same subversive tradition as Warhol, confronting the latest icons of capitalism: no longer mass consumer brand, but elite art object. Her scrawls resemble graffiti, a form of protest art against property that flourished with the entrenchment of property rights in the 1980s. Graffiti as an expressive critique of trespass in the museum calls out a link between art institutions and broader forces of privatization and inequality. The protest levels the critique that galleries are exclusive spaces, policed sites of wealth preservation, accumulation, and privatization.

In designing the protests, "Just Stop Oil" and "Letze Generation" activists may or may not have been tracking all the cultural and art historical nuances of their interventions. Nevertheless, cultural conflicts play out in different approaches to representation. In their own times, the works the activists targeted created representative modes that indexed social and political critique. The activists, plastering the works of two of the most famous practitioners of Impressionism (Monet and Van Gogh) with the literal materials of consumer capitalism — tomato soup — that a Pop/postmodern artist like Warhol depicted in his famous prints unwittingly dramatizes generational shifts in formal methods and social subjects of art. The tossed food — tomato soup and mashed potatoes — are visceral expressions of frustration with capitalism-as-usual that also recall the splattered paint




In September 2018, over 100 protestors staged a die-in at the Louvre, demanding it cut ties to fossil fuel sponsors. Photo by Romain Nicolas & Rafael Flichman, January 2019.

and expressive gestures characteristic of Jackson Pollock's Abstract Expressionist paintings.

Climate activism is thus in step with traditions of late-twentieth-century protest art such as that of the collectives Guerilla Art Action Group and Guerilla Girls, deploying the expressive methods of art-as-critique to disrupt the oil-powered commodification of art itself. These actions breathe life into art's vital processes of defamiliarization and transformation. At the core of these protests is a two-fold provocation: that how we represent and imagine our environments shapes approaches to environmental management and injustice beyond the gallery walls; and that those modes of representation and imagination are currently under conditions of restraint, enclosed in the galleries, funding structures, and commodity cultures grown to protect the value of the art object.

Inserted into the thick space of the gallery, these climate protests both demand new institutions of art and culture and enact a model for that future. Soup and potatoes splattered across famous paintings turn the images back into mere canvases. The demand here is to burst through the patina of an approach to preservation that goes to great lengths to protect art as capital investment but not to protect the material conditions of livable futures for all humans and animals. The soup and potatoes flung across canvases also interject in the gallery a visceral realism: what is the material life of a painting when environmental crisis disrupts the provision of the basic necessities for human survival? When a painting burns in a wildfire or drowns in a flood, is it anything more than a canvas? This realism is palpable in the hands of the activists shaking as they struggle to open small vials of glue, spread it on their hands, and affix themselves to the wall. The activists' shaking hands force a continuity between civic life, sustenance and survival, and art institution.

Galleries and museums are at the forefront of the cultural work of responding to environmental crisis. By disrupting the codes of conduct in the gallery — no touching the paintings, for example — the "Just Stop Oil" activists challenge these institutions' cultural authority. If such scholars are drawing into relief the power structures that archives

perpetuate, artists of the so-called "institutional critique" school of practice challenge the supposed social neutrality of galleries and museums. Artists like Andrea Fraser and Chris Burden, among others, take the governing conventions of galleries and museums as subjects for art, doing things like excavating the floor of a gallery or inhabiting the personae of a museum docent to critique assumptions about art's cultural autonomy. Art in this vein puts the gallery itself into the frame to make visible the socio-political and economic underpinnings of art institutions, which are notoriously hermetic and economically exclusive. The art of institutional critique disrupts the gallery itself in a similar vein to the environmental activists who lodge their critique on the surfaces of the paintings, transgressing the conventions of access to open up the gallery to unexpected and unscripted forms of meaning making. Splattered food productively dirties and disrupts the fantasy of the neutral gallery space.

*Galleries are implicated in climate crisis all the way through, from fossil fuel capitalism to environmental cultures*

While art galleries might seem far away from the frontlines of the climate crisis, galleries are implicated in climate crisis all the way through, from fossil fuel capitalism to environmental cultures. In turn, the impacts of climate change are now affecting galleries and museums all over the world. As weather becomes more extreme and the effects of climate change become more broadly felt, floods and fires are increasingly destroying the artifacts and built environments of galleries, museums, and archives. For example, in 2017, a flood at the Svalbard Seed Vault caused by melting permafrost threatened seed samples; while in 2018, a fire at the National Museum of Brazil caused Alexandria-level losses of irreplaceable — and prominently Indigenous — artifacts. Recently, the 2023 wildfire in Lahaina destroyed the Lahaina Heritage Museum, resulting in the loss of its entire collection.

The "Just Stop Oil" and "Letze Generation" protests therefore were not just disruptive, they were also timely and prescient. While tomato soup and mashed potatoes manifest a critique of an institution out of step with its civic potential as a space for productive dialogue and education in pursuit of social equality and justice, climate change puts into material crisis the cultures shepherded by galleries and museums, and the very preservation of contemporary life.

If the objects galleries and museums hold let us tell stories about who we are and where we are going, those objects and those stories are quickly transforming. How do we need institutions to change in and for the climate crisis? To what extent is culture as we know it entwined with the perpetuation of resource extraction and capital accumulation? What cultures do art museums preserve, really, and what is their civic role in the face of environmental crisis? These are the questions the "Just Stop Oil" and "Letze Generation" activists pose in their protests. They are burning questions that art institutions should heed and live with — not just in their curation, but in throughout their structure and function.

*This story was originally published by* Edge Effects*, a digital magazine about environmental issues produced by graduate students at the Center for Culture, History, and Environment.*


"Just Stop Oil" protesters in front of Van Gogh's *Sunflowers* covered in tomato soup. National Gallery, London UK. Courtesy of Just Stop Oil, October 14, 2022.

# Introducing the Nelson Ambassadors

*Meet the group of students elected to represent the Nelson Institute undergraduate community.*

By Isabella Lubotsky and Chelsea Rademacher

Since it first opened to students in 2011, the Nelson Institute's environmental studies undergraduate major has seen rapid growth — after just one year, the number of declared students nearly doubled. As the major grew, so did the needs of its students. After a few years, Becky Ryan — who was then the undergraduate program coordinator and is now Nelson's distinguished advising manager — pitched an idea: to empower Nelson undergrads to have a role in building their community. That's how the Nelson Ambassadors program began. Now, each spring, five or six Nelson In-stitute undergraduate students are selected to represent the student body's interests and plan events, like study sessions, movie nights, and more.

"If it weren't for the ambassadors, we wouldn't have the capacity to provide quality engagement opportunities for current Nelson students," says Ryan. "It's an ideal way for prospective students to learn about the institute. They're energetic, creative, and passionate about helping other students!"

*Get to know this year's ambassadors:*

**Grace Gooley**
Hometown: Minneapolis
Class: Junior
Majors: Environmental Studies, Chemistry (L&S)
@gracegooley

*"The Nelson Institute has a welcoming environment, which is one reason all of my environmental studies courses are my favorite."*
— Grace Gooley

I have always had a love for the environment, especially oceans. As a kid, I would spend hours outdoors collecting rocks and playing outside. I've always felt drawn to the outdoors, which is why I have decided to study the environment. I love how many learning opportunities are offered through the Nelson Institute year round! The Nelson Institute has a welcoming environment, which is one reason all of my environmental studies courses are my favorite. Since August, I have been working as the administrative undergraduate assistant for UW–Madison Division of Extension's Natural Resource Institute. I have been in the professional co-ed chemistry fraternity, Alpha Chi Sigma, since the spring of my freshman year. This semester I am vice president, which has been so much fun! I volunteer through Badger Volunteers as well, and I will be volunteering at an after-school program at a nearby elementary school this semester. I have been doing undergraduate research in the Hermans group for about a year, and I am about to start my senior thesis! I will be researching the effects of autoxidation on hexane, and hopefully this information will help us find new ways to be able to recycle, upcycle, or extend the lifetime of plastics. My favorite Nelson Institute professor is Dr. Kanarek. Not only is he incredibly smart, but he has also helped me look at graduate schools and talk about my future interests. I hope to go to graduate school for a PhD in climate change research. I haven't decided exactly what I want to research, but I would love to do a project relating to marine chemistry and ocean acidification, or a project on extreme weather research.

**Maddie Schultz**
Hometown: Milwaukee
Class: Senior
Majors: Environmental Studies, Latin (L&S), and Classical Humanities (L&S)
@schultzmadeline

*"I love the Nelson Institute's mission and diverse community that brings in positive energy for climate solutions."*
— Maddie Schultz

Ever since I was a kid visiting my grandma's farm up north, I've been fascinated by nature. As my love for the environment and classics grew, I noticed how relevant Roman and Greek texts are in modern environmental policy, poetry, and relationships. My favorite professor is Anna Gade, she supported my cross-examination of classics and environmental studies. I love the Nelson Institute's mission and diverse community that brings in positive energy for climate solutions. Extending that love for community, I am also involved as the Classics Society President and the Wisconsin Union Directorate's vice president of internal relations. After graduation, I hope to work as an education program manager for an environmental nonprofit!

**Layna Erredge**
Hometown: Rochester, Minnesota
Class: Sophomore
Majors: Environmental Studies, Conservation Biology (L&S)
@layerredge

*"The community here is so friendly and supportive. It makes me excited to learn and work in the environmental field."*
— Layna Erredge

Growing up, I was shaped by the environment. We had a garden where I found my love of tomatoes. There were always some small animals running around our backyard. Multiple times, I have woken up and looked out my bedroom window and had a deer staring at me. I also went on camping trips with my mom and grandparents, and I remember loving the feeling. All these experiences solidified my belief that the environment is the most pressing societal issue. I wanted to study how it worked and how I could protect it, so the Nelson Institute is a great fit.

I love the Nelson Institute for providing me with the tools and opportunities to do this. The community here is so friendly and supportive. It makes me excited to learn and work in the environmental field. My favorite Nelson class so far has been Environmental Studies 306: Indigenous Peoples and the Environment. Other activities I am involved in outside of Nelson Ambassadors include the Hoofer Outing Club, Conservation Biology Club, intramurals, and research. After school, I plan to work in topical conservation worldwide, specifically in aquatic ecosystems.

**Anna Kossolapov**
Hometown: Oshkosh, Wisconsin
Class: Junior
Majors: Environmental Studies, Political Science (L&S)
@annakossolapov

*"I love being part of the Nelson Institute because it has introduced me to so many unique and inspiring people.."*
— Anna Kossolapov

I chose to study the environment because it played such a crucial role in my childhood, and I hope to learn how to better protect it for current and future generations. I love being part of the Nelson Institute because it has introduced me to so many unique and inspiring people who are deeply passionate about the environment, as well allowing me the opportunity to get more involved with my campus and local community. Currently, I work as the programming director for the People's Farm: Students for Sustainable Agriculture, a student organization that's focused on connecting people, land, and food by distributing (for free) the organic produce we grow on our farm, located in the Eagle Heights Community Garden. One of my favorite classes I've taken at the Nelson Institute has been my environmental studies capstone course: Food Excess to Access. In this course, I was able to hear from several community figures involved in our local food system, as well as being able to spend time working hands-on to promote food access. After school, I hope to continue my environmental studies education by pursuing a law degree to hopefully become involved in the field of environmental law.

## Barbara Strugalla

Hometown: Geneva, Illinois
Class: Sophomore
Major: Biology and Wildlife Ecology (College of Agricultural and Life Sciences)
Certificate: Environmental Studies
@barbara13strugalla

*"The environment intersects with almost all fields of study, so it is an advantage to study it."*
— Barbara Strugalla

I chose to study the environment because I was interested in the environmental classes I took in my first year. The environment intersects with almost all fields of study, so it is an advantage to study it. I love how the Nelson Institute is very dedicated to their students (undergraduate and graduate) and how many great opportunities they provide. They have numerous events throughout the year that allow the students to network and connect with faculty and other students. On campus, I work at the UW Veterinary Hospital as a student hourly in their small animal operating room and night ward, working on pre-operative and post-operative patients. I am also involved in the UW–Madison Cycle Forward club as the community outreach coordinator. My favorite class at the Nelson Institute is ENVIR ST 213: Global Environmental Health: An Interdisciplinary Introduction. Richard Keller, a fantastic lecturer, taught this class and engaged so much with his students. He was so passionate about teaching environmental health, it became one of my favorite classes. I recommend this class to anyone interested in learning about certain disease epidemics and ecological issues that cause health issues. After my undergraduate studies, I plan on attending veterinary school to study wildlife medicine. The environment is a massive aspect of wildlife medicine because environmental conditions can change disease spread, species dispersal, etc. I hope to work in a wildlife rehabilitation clinic or with endangered species.

## Isabella Lubotsky

Hometown:Greenfield, Wisconsin
Class: Senior
Majors: Environmental Studies, Political Science (L&S)
Certificates: German, Public Policy (L&S)
@isabella71153

*"All of the professors I've had and friends I've met on this side of campus are all so passionate about the work they do, and it's a great environment to learn and grow in (pun intended)."*
— Isabella Lubotsky

I chose to study the environment because climate change is an issue I've been interested in for as long as I can remember. My freshman year, I was enrolled in the Preserving Nature first-year interest group where I was able to take three environmental studies classes my first semester, and I've been hooked ever since! My favorite thing about the Nelson Institute is the community. All of the professors I've had and friends I've met on this side of campus are all so passionate about the work they do, and it's a great environment to learn and grow in (pun intended). My favorite class I've taken with Nelson definitely has to be the Community Environmental Scholars Program (CESP). Outside of Nelson, I have an internship with the Dane County Office of Energy and Climate Change, I'm involved in Campus Leaders for Energy Action Now (CLEAN), I play trumpet in the Badger Band, and I am president of the Badger Band Sustainability Team. After graduation, I'm excited to have a lot more free time, and I hope to be involved with community engagement and local sustainability and policy initiatives.

# From Lab Work to Land Management

*EOI student Linnea Patterson works to use science to inform management decisions.*

By Anica Graney

Patterson (bottom left corner) with her EOI cohort members. Photo courtesy of Linnea Patterson (3)

For Linnea Patterson, studying biology was — well, in her biology. With both her parents and stepdad working as biologists, it was a good bet that she would want to follow in her family's footsteps. "I grew up in a family of enthusiastic biologists," Patterson said, "which likely influenced getting my degree in Biology and Environmental Studies from Bowdoin College, which is a small liberal arts school in Brunswick, Maine."

As Patterson attended Bowdoin College, she expanded her horizons through a summer tropical field biology program and became interested in geographic information systems (GIS), computer mapping programs that analyze and display geographic data. She then went on to take every GIS and remote sensing class that Bowdoin College had to offer which laid the foundation for her work's motivation: using science to inform management decisions.

"One of the biggest challenges for scientists is how to communicate the data they're observing, collecting, or analyzing to people who are in a position to use it on the ground." Patterson said. "In order to move from science to action, you have to translate it into an accessible format that can be easily digested, and I think that maps are a great way to do that."

After graduating from Bowdoin College in 2018, Patterson returned to work at Coastal Enterprises Inc. (CEI), a community development financial institution working to fill the gaps in the commercial financial industry and take on the perceived risk of lending when a traditional commercial bank would deny someone a loan for various reasons. "I was really into STEM courses in college and doing a lot of lab work, and then I realized I wanted something that was a bit more people and community based," Patterson said.

Patterson worked as CEI's Environmental Lending Specialist where she helped loan officers conduct background

research on lendees and supported the expansion of solar investments in Maine— later transitioning her role into a Program Developer in Climate Justice and Environmental Resilience with a focus on helping communities and businesses participate in the green transition.

After a few years of working with CEI, Patterson hoped to return to GIS. A tip from a current UW professor and a quick online search led her to the Nelson Institute's environmental observation and informatics (EOI) master's program. As she read about the program's opportunities — including an Organic Valley fellowship — she felt her heart "speed up." That's exactly what she wanted to do: translate science into action.

"Now I'm here in the EOI program that is really focused on applying technical tools to scientific questions," Patterson said. "I'm really excited about how this program is going to help me prepare for a future where I can be one of the people translating science to end users."

Patterson's classes, especially those taught by Associate Professors Annemarie Schneider and Mutlu Özdoğan, have helped prepare her for this future by teaching her remote sensing theory and application. "Those classes have been excellent. I've learned a lot about remote sensing from them," Patterson said. "[Schneider and Özdoğan] are great teachers. They're teaching really complex concepts to people who probably haven't encountered remote sensing before."

As Patterson finishes the spring semester of the EOI program, she has her sights set on her summer capstone: working with Organic Valley through the Farmers Advocating for Organic (FAFO) grant program. While the details of her project are still in the works, Patterson will help Organic Valley improve a biomass modeling algorithm that gives farmers predictions on the amount of grass growing in their pastures. "I know that I'll be helping improve how we inform farmers about what's happening on their land and hopefully in a way that is helping them make decisions about how to optimally manage it or make long-term decisions about their fields," Patterson said.

The EOI program's partnership with Organic Valley aims to support a student who has the technical skills in analyzing satellite data that could support Organic Valley's efforts. "Especially if the student also had an interest in data communication and supporting the community of farmers," said Sarah Graves, graduate program manager. "Because of the support of Organic Valley and the FAFO program, Linnea is building her technical data analysis skills with a focus on providing valuable information to farmers."

Patterson will graduate from the EOI program in August of 2024 and advises other students interested in science to just be curious. "I think that's what makes a good scientist — being really curious about the problem you're trying to solve or being curious enough to observe something that you want to know the answer to," Patterson said.

Take Patterson's advice to heart; she has the biology to back it up.

Top: Linnea Patterson; Above: Patterson in Bagaces, Costa Rica at the Palo Verde Research Station during her tropical ecology field course during the summer of 2015.

# Days of Wine and Geology

*Winemaker Anne Ebenreiter Hubatch '99 blazes her own trail in Portland.*

By Aaron R. Conklin,
College of Letters & Science

Winemaking is a physically taxing job. Wine barrels weigh nearly 100 pounds when they're empty, and can weigh 600 pounds when full. Photos by Joshua Chang (4)

Anne Ebenreiter Hubatch '99 (geology and environmental studies) is frequently asked what it is like to be a female winemaker in a field that tends to be dominated by men. In the United States, only about 18 percent of winemakers are women.

In response, the founder and owner of Portland, Oregon's Helioterra Wines, the winery she founded in 2009, chuckles and shares an anecdote from an event she recently attended, a four-course "dueling winemaker" meal that pitted her against a male winemaker she had mentored a decade ago. The two were canvassing the room, talking to guests tableside.

"One of the gentlemen at a table commented, 'You don't look like a winemaker to me,' " says Hubatch. "And I asked, 'Okay, what do you think a winemaker is supposed to look like?' I think he expected me to look like my friend, a man, who was wearing a T-shirt and shorts and looked like Jesus."

Hubatch has been making wine long enough — more than 20 years now, 14 with her own company — to remain undeterred by thoughtless comments like these.

"At this point, I've become less apologetic about who I am, what I do, and how I do it," she says. "I know that I'm good at what I'm doing. I know who I am. I do not need to be an overt feminist to be a leader and entrepreneur/business owner." Hubatch studied geology and environmental studies as an undergraduate at the UW and first moved to Portland to pursue work in the environmental nonprofit space. She knew she needed a graduate degree to forge a career in geology, but graduate school was not in her plans yet.

"Instead, I found myself in the Willamette Valley, one of the most up-and-coming wine regions in the world," she recalls.

To make additional cash and meet new people, she took a weekend job in a wine tasting room — an experience that spurred her to sign up for a winemaking curriculum at a local community college. When fundraising for her nonprofit job became challenging in the wake of 9/11, she jumped into the wine business with both feet, taking a job with an established local winery.

And landed squarely at the bottom.

"I was the cellar grunt and had my humility handed to me that first harvest," Hubatch recalls. "I mean, it's hard work. Winemaking is physically challenging work. I think this is the leading reason you don't see more women in the cellar. Many people say that winemakers are limited to what they can do by their bodies, not necessarily their passions."

Wine-sippers are typically unaware of how physically taxing winemaking can be, moving heavy wine barrels which weigh one hundred pounds when empty, six hundred pounds when full. (Becoming an expert forklift driver, as Hubatch has, becomes key.) And managing the punch-down, where Hubatch must stand over a fermenting vat of wine and push the grapes back down with a massive plunger to keep the wine mixture balanced.

Between managing grape harvesting and fermentation, Hubatch typically works 10- to 18-hour days during the harvest season. And that just covers the winemaking side. She also manages marketing, sales, bookkeeping and events for Helioterra.

*"I've become less apologetic about who I am, what I do, and how I do it."*

— Anne Ebenreiter Hubatch

Hubatch has worked her way up the grape-laden ladder, from cellar assistant to winemaker. In the middle of the 2009 recession and pregnant with her second child, Hubatch took the leap, taking half the equity out of her home mortgage to buy grapes and barrels and rent a little corner of space in a friend's urban winery.

"I took a shot on myself," Hubatch says.

Portland and the Willamette Valley are pinot noir country — they are on the same geographic parallel as Burgundy, France — and that's where Hubatch began her craft. But she has also explored the other seventy grape varieties that grow there. She makes twenty types of wine, marketed under two brands: Helioterra, which includes artisan handcrafted wines like pinot noir and pinot blanc, and Whoa Nelly! — a brand Hubatch describes as Helioterra's "tomboy little sister," a more approachable and fun value-oriented brand.

Hubatch's personal favorite is her concrete fermented Melon de Bourgogne, a crisp and vibrant white that she ages in a concrete egg tank.

"It's awesome with oysters and seafood, and it's a unique wine," Hubatch says. "I'm very, very proud of that one."

The name Helioterra nods to her Wisconsin geology background and her chosen home of Oregon. The name is inspired by Oregon's state gemstone, the heliolite, more commonly referred to as the sunstone, and the "terra" part refers to the earth in which the grapes grow. The logo she chose is an ammonite fossil, another nod towards Madison geology.

Hubatch loves being able to bring the geology expertise she acquired in Madison to bear on her winemaking. She has learned about the Mediterranean and volcanic soils in Oregon that give the grapes she grows their distinctive flavor profiles, knowledge she often shares with her customers and guests.

Hubatch prides herself on supporting other women in the industry and a commitment to sustainability. She also maintains close ties to the UW. During the pandemic, Hubatch hosted a Zoom tasting with Badger alumni in Oregon. One of Hubatch's UW friends took smart advantage, asking the group which wine went best with bratwurst. (Hubatch's answer? Shiraz.)

As she looks to the future, Hubatch is aware her role is likely to shift. She broke a finger and fractured her ribs while moving heavy equipment earlier this year, a sharp reminder that nobody can meet the steep demands of the gig forever. She is currently weighing long-term options.

But for now, she is enjoying all she has accomplished.

"I feel like UW–Madison and geology gave me a great start towards this," says Hubatch. "A lot of people don't quite end up in the profession that their degree was in, but the rocks, soils and growing are an important piece for me."

*This story was originally published by the College of Letters & Science.*

Hubatch and a coworker survey the contents of a wine vat.

Anne Hubatch reviews a fresh batch of grapes grown from vineyards located in Oregon and Washington.

# SAVE THE DATE

*Celebrate the Nelson Institute during Day of the Badger*

Day of the Badger, a celebration of what makes UW–Madison great, is coming back April 16–17! Save the date to join the philanthropic festivities and help to make Nelson stronger today for the Badgers of tomorrow. Watch your email and follow along on our social media accounts (@nelsoninstitute).

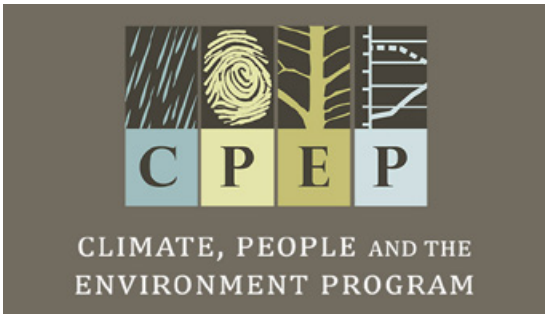

# *Support* NELSON

**Interested in supporting the Nelson Institute?**

There are many ways to contribute to the Nelson Institute — participating in our events, mentoring our students, providing connections to your personal networks, and making financial gifts. All of these are necessary and important to us, and we invite you to invest in our community in the way that makes the most sense to you.

Learn more about all of the great academic programs, research centers, and public programs we offer.

*Gifts in any amount are needed and appreciated!*




## CPEP Series

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

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


## Weston Roundtable Series

The Weston Roundtable Series promotes a robust understanding of sustainability science, engineering, and policy through weekly lectures co-sponsored by the Center for Sustainability and the Global Environment (SAGE), the Department of Civil and Environmental Engineering, and the Office of Sustainability. Lectures are on Thursdays from 4:15–5:15 p.m. at 1163 Mechanical Engineering.

Learn more about this lecture and others in the series.


## Center for Culture, History, and Environment: Environmental Colloquia

The Center for Culture, History, and Environment (CHE) invites you to attend the Spring 2024 CHE Environmental Colloquia series on Wednesdays from 12–1 p.m. in 140 Science Hall.

## Center for Ecology and the Environment Spring Symposium

April 8–9, 2–5:30 p.m. each day
Great Hall, Memorial Union

Join the Nelson Institute's Center for Ecology and the Environment as they host their 2024 Spring Symposium! This annual event highlights the variety of ecology research across campus, with a focus on early-career researchers, including undergraduates, graduates, and postdoctoral researchers. This year features keynote speaker Michael Dillon from the University of Wyoming. Register today!

# EARTH FEST

*Presented by the Nelson Institute for Environmental Studies and the Office of Sustainability*

## APRIL 19–26, 2024

**April 19**

### EARTH FEST KICKOFF CELEBRATION
Exhibit tables, lectures, dance performance, CHE Art and Environment Exhibit

**April 20**

### ECOLOGICAL RESTORATION WORK PARTY: GRADY TRACT
Hosted by the UW–Madison Arboretum

### A JUST TRANSITION FILM SCREENING
Hosted by the Nelson Institute for Environmental Studies

**April 21**

### LEND A HAND TO THE LAND: LAKESHORE NATURE PRESERVE VOLUNTEER DAY
Hosted by the UW–Madison Lakeshore Nature Preserve

### SPRING FEST
Hosted by The People's Farm

**April 22**

### EARTH DAY MEAL
Hosted by Dining and Culinary Services

### UW–MADISON CLIMATE AND JUSTICE TEACH-IN
Hosted by WEI and CLEAN

**April 23**

### THE HISTORY AND FUTURE OF ENERGY RESEARCH AT UW–MADISON
Hosted by EAP and WEI

### FLOCKING TOGETHER: EVENING WALK AND DISCUSSION WITH THE BIPOC BIRDING CLUB
Hosted by the Office of Sustainability

**April 24**

### MUSIC, SOUND, AND ENVIRONMENT
Hosted by the Center for Culture, History and Environment

### FOOD SUSTAINABILITY: ROUNDTABLE DINNER
Hosted by Office of Sustainability x Slow Food x ASM Sustainability

**April 25**

### ACHIEVING DRAWDOWN: A HOPEFUL, SCIENCE-BASED PLAN TO ADDRESS CLIMATE CHANGE WITH JONATHAN FOLEY
Hosted by the Center for Sustainability and the Global Environment

### ROADMAPPING SUSTAINABILITY IN THE WISCONSIN SCHOOL OF BUSINESS
Hosted by SEBA

**April 26**

### SUPPORTING THE VITALITY OF RURAL COMMUNITIES THROUGH THE WISCONSIN RURAL PARTNERSHIPS INSTITUTE
Hosted by the Center for Climatic Research

### UW ZERO WASTE WORKSHOP
Hosted by the Office of Sustainability

## AND 40-PLUS MORE EVENTS!

*Thanks to the following individuals and organizations for their financial support of Earth Fest.*

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University of Wisconsin Environmental Awareness Fund

Laurie Carlson Progressive Ideas Forum

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