August 2022

Nelson Institute for Environmental Studies
UNIVERSITY OF WISCONSIN–MADISON

THE COMMONS

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

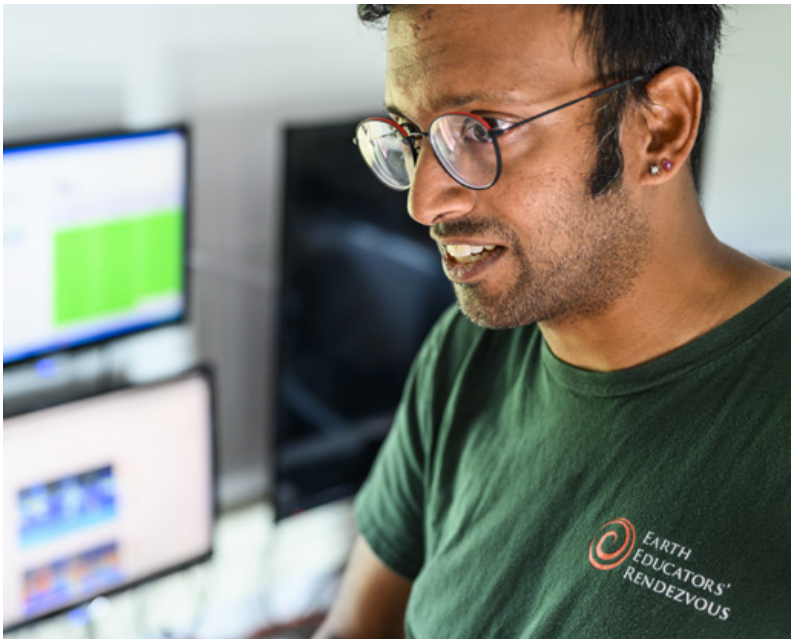
Guadalajara, Mexico's new museum of environmental sciences has a unique Nelson connection

Assigned Reading: Ankur Desai

What does a weather and climate expert read for fun? Professor Ankur Desai shares his recommendations.

By John Allen, Wisconsin Foundation and Alumni Association

More than most professors, Ankur Desai spends a lot of time considering what conditions are like on scales that are both minuscule and massive: how the individual affects the world's climate, and how the climate affects the way things feel for an individual person. Desai holds the Nelson Institute's Reid Bryson Chair for Climate, People, and Environment and chairs the Department of Atmospheric and Oceanic Sciences. He also runs the UW's Ecometeorology Lab, which "studies how organisms and abiotic features in terrestrial and aquatic ecosystems influence and are influenced by climate and weather and how those effects change as you scale from plot to landscape to globe." In other words, he studies the climate, and he studies micrometeorology (weather conditions on a scale so people only indirectly experience them).



Ankur Desai. Photo credit: Jeff Miller (2)

"These smallest scales of motion that matter for atmospheres and weather and stuff are about a millimeter and about a millisecond in time," he says.

The best thing for scientists to read? "Fiction," Desai says. "Novelists, they live and die on people hanging on their every word."

Desai's research team, housed in Nelson's Center for Sustainability and the Global Environment, operates CHEESEHEAD19 — short for the Chequamegon Heterogeneous Ecosystem Energy-balance Study Enabled by a High-density Extensive Array of Detectors — a series of 19 climate monitoring stations in northern Wisconsin. CHEESEHEAD19 aims to improve our understanding of how large-scale motion in the atmosphere affects surface-level weather at different spots. It requires collecting and processing a lot of data, so that he and fellow climate scientists can discern how small changes lead to big effects.

"One of the biggest uses of super-computing in the United States is weather forecasting and climate detection," he says, adding that "what's known as chaos theory really came about in meteorology."

Desai teaches several courses, including undergraduate classes such as AOS 171 Global Change and Atmospheric Issues, and graduate-level classes such as AOS 773 Boundary Layers, Micrometeorology, and Turbulence. In addition to some of his favorite assigned readings, Desai also shares some recommendations from his personal bookshelf.

Ankur Desai recovers a National Oceanic and Atmospheric Administration (NOAA) weather drone in the Chequamegon-Nicolet National Forest.

My assigned textbooks include:

- For AOS 773: *An Introduction to Boundary Layer Meteorology* by Roland Stull
- For AOS 171: None

"There isn't one great textbook for [AOS 171] yet. What I really like students to do is to integrate both popular media and scientific assessment reports. We rely on things like the Intergovernmental Panel on Climate Change reports, the federal National Climate Assessments. We compare those to things that are written in everything from the *Wall Street Journal* to YouTube."

In my spare time, I read:

- *New Yorker*
- *National Geographic*
- *MUSE*

"I'm a sucker for paper magazines," Desai says. "I might be the generation that is kind of toward the tail end of that, and thankfully we have middle schoolers who sell those magazine subscriptions as fundraisers." He even enjoys *MUSE*, which is aimed at children. "I just really like how they present science as done by people who come from many different backgrounds, and it doesn't dumb it down for kids. At the same time, it has that goofy middle-schooler vibe. The people who write it, they remind me of what I was like as a middle schooler."

The book I read over and over is:

None: "I'm kind of a funny person as I read novels, I love fiction, but I have a hard time reading books multiple times."

The book everyone should read is:

- *Lab Girl* by Hope Jahren
- *The Overstory* by Richard Powers

"[*Lab Girl*] gets into some really tough discussions about sexism in the academy and issues of power in academic, toxic cultures," he says. "But it's a good read. It influenced my daughter. [*The Overstory* is] a really nice fictionalized account of environmental activism with a really great perspective," he says. "I bought it for everyone in my lab."

The best writing for scientists Is

"To be honest, fiction," he says. "Novelists, they live and die on people hanging on their every word."

This story was originally published by the Wisconsin Alumni Association's Badger Insider *magazine*.

UW Geography Students Share Appleton International Airport's Sustainability Story

Geography 309 partnered with UniverCity Alliance to connect students with communities.

By Abby Becker, UniverCity Alliance

The Appleton International Airport features sustainable elements such as solar panels, a biofiltration basin, and a net-zero energy building. Photo credit: Karina Lisogor (3)

"It's such a breath of fresh air to have a faculty member come to UniverCity Alliance with students who want to work in and with communities and seek funding to help support that work."

— Gavin Luter

While traveling through the Appleton International Airport, both first-time visitors and longtime passengers may be surprised to learn that the building produces as much renewable energy as it consumes.

They may also be delighted to discover that the meals they eat while waiting for their connecting flights are made with fresh ingredients grown in an on-site hydroponic farm, and that the natural lighting they enjoy minimizes the facility's energy use.

These features are part of a larger sustainability story that the airport will be able to tell more effectively with a suite of tools, including a video, created by University of Wisconsin–Madison geography students in partnership with UniverCity Alliance (UCA) — a cross-campus initiative that pairs local governments with UW classes to solve community problems.

"We have a great sustainability story here at the airport, and we didn't have a cool way to showcase it to our audience, and now we do," said Hollie Foley, the airport's marketing and communications specialist. "We are excited to promote our story on our website and social channels, thanks to all the good-looking art assets and information that the students collected."

Students in Geography 309: People, Land and Food — taught by Holly Gibbs, geography professor in the Nelson Institute's Center for Sustainability and the Global Environment — explored food sustainability and took on their own projects related to sustainability. This course partnered with UCA to connect with communities, including Outagamie County where the city of Appleton and the airport is located.

The course recently received the Kemper K. Knapp Bequest, which allowed Gibbs to support an additional project assistant — a role held by Nelson Institute PhD student Jules Reynolds. This position contributed to strengthening an emerging connection with UCA and provided the necessary support to create strong partnerships with Wisconsin communities.

UniverCity Alliance managing director Gavin Luter said he appreciated Gibbs and Reynolds' commitment to making the project successful both for their students and the community partners. Their work to manage communications between everyone involved, determine the scope of work, and oversee details that are essential — but often overlooked — for partnership building was invaluable.

"It's such a breath of fresh air to have a faculty member come to UniverCity Alliance with students who want to work in and with communities and seek funding to help support that work," Luter said. "Our partners at the airport are very forward-thinking and have shown a commitment to the environment. More people need to know about this work!"

Additionally, Luter said it was "extra rewarding" to have the students work on an important topic like sustainability at the Appleton International Airport.

Karina Lisogor, a senior double-majoring in environmental studies and consumer behavior and marketplace, who worked with the airport, said she was surprised at how sustainable the airport is and that she is proud to be a part of the greater Appleton community.

"I learned that smaller airports treat each other and their guests like family, and it's not just because of the small footprint," Lisogor said. "It just amazes me what our future could look like if similar communities would implement those same, simple sustainable initiatives into their businesses."

In addition to the video, the group working with the airport created infographics, social media templates, and photos to help the airport share its message of sustainability. These materials highlight the terminal's skylights, solar panels, biofiltration basin, and net-zero energy building.

Foley said the airport hopes to update the airport's website with these materials, use them on social media accounts, include physical copies at the airport, and share them via a QR code with travelers.

The hope is to build brand loyalty among passengers seeking eco-friendly brands when traveling.

"This video will help the Appleton airport share their sustainability story and build brand loyalty," Foley said. "Previously, the Appleton Airport did not have much telling their sustainability story, so this will help get our message out in a fun way."

L-R: Solar panels are a part of the Appleton International Airport's building design. Lettuce used in restaurants at the airport is grown at an on-site hydroponic farm.

This story was originally published by UniverCity Alliance.

Great Lakes Coastal Communities and Ecology at Risk from Warming Climate

By Dea Larsen Converse,
Wisconsin Initiative on Climate Change Impacts

The Great Lakes are experiencing a decrease in the extent and duration of ice cover. Danger Thin Ice, 2015 Great Lakes Photo Contest. Photo credit: Edward Deiro

"Climate change is stressing all ecosystems. Protecting coastal habitats and habitat restorations can build climate resiliency into our ecosystems."
— Titus Seilheimer, WICCI Great Lakes Working Group Co-Chair

For Wisconsinites, the dangers of climate change are getting close to home. The last two decades have been the warmest on record in Wisconsin, and the past decade has been the wettest, resulting in changes to the ecology of Wisconsin's Great Lakes basin. A report from the Wisconsin Initiative on Climate Change Impacts (WICCI) shows that climate effects such as water-level fluctuations, changes to water temperature and lake mixing, and ice-cover changes are impacting water quality and lake habitats.

Home to over 3,500 species of fish and wildlife, Wisconsin's Great Lakes basin provides drinking water, recreation, and livelihood to more than 34 million people. As the lake levels rise and fall, coastal habitats expand and shrink naturally — but rapid changes in Great Lakes water levels, extreme storms, and longer wet periods are increasing flooding along coastal shorelines. These changes are affecting both habitats and structures built along the lakeshore. Coastal beaches are eroding away. Invasive plants are displacing native plant communities in coastal wetlands.

The increasing frequency of extreme precipitation events and warming waters in lakes are also leading to more microbial contamination on beaches and increasing the risk of potentially toxic blue-green algal blooms. In 2018, extreme storm events elevated nutrient levels along the south shore of Lake Superior for months, fueling major algal blooms along the shoreline. While Green Bay has been experiencing algal blooms for decades, it is a

concerning new phenomenon in Lake Superior. Runoff into the Great Lakes from extreme storm events also brings contaminants with the potential to move through the food web into the fish that are an important part of the diet for fishers from Tribal Nations, Hmong populations, and other subsistence fishers.

Coastal wetlands provide important habitat for fish, wildlife, and wild rice. Great Blue Heron, 2016 Great Lakes Photo Contest. Photo credit: Janna Soerens

Changes in air temperature influence the amount of ice cover, water levels, clarity, and chemistry associated with fish habitat. As the water temperatures rise, cold-water fish will likely move into northern and deeper parts of the lakes, opening up more thermal habitat for cool-water fish like walleye. However, changing precipitation patterns could potentially lower their growth rates and damage their spawning habitats. A continuing trend of decreasing extent and duration of ice cover on the Great Lakes can increase erosion, which could affect fall and winter fish spawning beds as well.

But hope isn't lost. The WICCI Great Lakes Working Group recommends solutions to make Wisconsin's coasts more climate resilient, including actions like restoring native vegetation, increasing tree canopies, and more. There is hope for the future — but it's up to us.

Support WICCI

Gifts to the Wisconsin Initiative on Climate Change Impacts (WICCI) program fund provide general, discretionary program support and are used to enhance and expand WICCI's teaching, research, and public service roles. Gifts are also used to support partnership-building activities, including faculty, staff, and student recruitment, retention, and morale.

WICCI is a statewide collaboration of scientists and stakeholders formed as a partnership between UW–Madison's Nelson Institute for Environmental Studies and the Wisconsin Department of Natural Resources. WICCI's goals are to evaluate climate change impacts on Wisconsin and foster solutions.

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

Efforts to reduce stormwater runoff and find nature-based solutions can improve water quality and improve recreation. Summer Fun, 2016 Great Lakes Photo Contest. Photo credit: Carol Toepke

Great Lakes

Afloat in the middle of the storm

Nothing gets your attention better than Mother Nature nearly killing you

Record-high Lake Superior water levels causing erosion on Wisconsin Point in Superior

Nuclear Fallout: From the Sky to the Sea

By Chelsea Rademacher

High altitude view of the Earth in space.

With the ongoing conflict between Russia and Ukraine, fears of nuclear war have increased across the globe. And while we've had an idea of how nuclear fallout will affect life on land, a new study, led by Louisiana State University, sheds light into what could happen in the darkest depths of the ocean.

Elizabeth Maroon, assistant professor of atmospheric and oceanic sciences, was on the research team that published the findings. Maroon is a faculty member in the Nelson Institute's Center for Climatic Research, an interdisciplinary center that focuses on the Earth's climate systems, particularly historical, ongoing, and projected climate variability and change.

On land, it would take about a month for nuclear fallout to cause temperatures to drop — climate modeling by Maroon suggests that the drop could be more drastic than the last ice age. "Changes in the ocean take longer than in the atmosphere or on land," Maroon says, but the team's modeling suggests that it would only take a year for ocean circulation to change beyond recognition.

Elizabeth Maroon

"Within the first year or two, water in the North Atlantic sinks all the way to the bottom of the ocean, which we think has not happened even in the ice ages."

— Elizabeth Maroon

"Within the first year or two, water in the North Atlantic sinks all the way to the bottom of the ocean, which we think has not happened even in the ice ages," says Maroon. "In today's ocean, only near Antarctica does water sink all the way to the seafloor."

This change in ocean circulation would only be the beginning — paving the way for a damaged ocean food web and extending sea ice.

The study required "impressive" international collaboration, says Michael Notaro, interim director of the Center for Climatic Research, and extremely advanced Earth system modeling techniques. "With the timeliness given the Russia-Ukraine conflict, [this study] really highlights the global dangers of nuclear conflict."

Read more about the study and Maroon's research.

UW–Madison Researchers Awarded $2.3 Million to Develop a Carbon-Negative Cement Replacement

By Michelle Chung, Wisconsin Energy Institute

Rob Anex discussing ideas with team members during a meeting in a lab at the Wisconsin Energy Institute. Photo credit: Michael P. King

Researchers from the University of Wisconsin–Madison, Penn State, and the University of Illinois–Chicago will use a $2.3 million grant from the Department of Energy (DOE) to develop a carbon-negative replacement for portland cement, turning the widely-used and previously carbon-intensive building material into a carbon sink.

Led by UW–Madison's Rob Anex, a professor of biological systems engineering and Nelson Institute professor in the environment and resources graduate program, and, Bu Wang, an assistant professor of civil and environmental engineering in the College of Engineering, the project will use carbon captured from the air to convert industrial mineral wastes like coal ash into a recyclable replacement for portland cement. The end goal is a durable and versatile building material that permanently stores carbon dioxide through a process that pulls more carbon out of the air than is emitted.

The research project is funded through DOE's Advanced Research Projects Agency-Energy (ARPA-E) HESTIA program, which supports the development of new technologies that cancel out the carbon footprint of construction materials while transforming buildings into net carbon storage structures. Research for the project will be conducted in Anex and Wang's joint lab in the Wisconsin Energy Institute.

Here, Wang and Anex share more about the project:

What is the challenge in producing portland cement, one of the most common building materials in the world, in an environmentally friendly way?

Wang: We use a lot of concrete and cement in our buildings and roads. The most critical challenge is producing quality concrete that meets all the specifications and requirements of portland cement — it must be strong enough, durable enough, and can be cast in place, while still maintaining carbon negativity.

Anex: In fact, we're trying to make something that's better than portland cement — cement that is more resistant to chloride and more durable.

How will this grant help to advance your research in this area?

Anex: There are a bunch of tasks involved here. One is modifying the direct air capture process to create the right quality of carbonated residue. Another task is creating tools for doing high throughput screening so we can test a lot of different feedstocks and combinations of process conditions. We must be able to handle the variability of feedstock and still produce a consistently high-quality product. Then we start creating the recipes for a portland cement replacement and testing it at a larger scale to ensure our product can do all the things that cement has to do.

Wang: In the end, we want to have a new procedure that will accelerate this development cycle.

What makes you most excited about this research?

Anex: Our direct air capture technology is great for pulling a bunch of carbon out of the air with low energy and low cost. This project will not only reduce our carbon footprint by replacing portland cement, but will make the capture process more economical. There is a federal policy that says if you want to sell concrete to the federal government, you must sell them low-carbon concrete, so there is already a market for carbon negative cement. This means we can capture a lot of carbon and produce a valuable product that will actually pay for that carbon capture.

Wang: I think this is an immediate market opportunity to commercialize direct air capture technologies, and we have one that can really make a fundamental change in how we make cement and concrete. People have been trying to do that for a long time, but I think we're on the verge of a real change.

This story was originally published by the Wisconsin Energy Institute.

The "Jalisconsin Idea"

Nelson alumnus and visiting professor won an award for his work at the University of Guadalajara and its up-and-coming Museum of Environmental Sciences.

By Chelsea Rademacher

Eduardo Santana Castellón

In June, UW alumnus and visiting Nelson Institute professor Eduardo Santana Castellón was presented with the Environmental Merit Award from the Jalisco (Mexico) State Congress. The award recognizes Santana Castellón's 37-year tenure at the University of Guadalajara (UdeG) in Jalisco, where he both teaches and leads research on environmental issues.

Santana Castellón arrived on campus from Puerto Rico in 1974 to earn a degree in the Department of Wildlife Ecology. He earned that degree — plus two more — and became a driving force in the field. Some of his notable projects include helping to establish the Sierra de Manantlán Biosphere Reserve, designing the World Wildlife Fund's Cuba Country Conservation program, and defending resources for western Mexico's Nahua and Wixárika indigenous communities. Santana Castellón also sits on numerous boards and committees, including the Cornell Lab of Ornithology, the Aldo Leopold Foundation and the UW's Global Health Institute.

On top of his teaching and research, a large part of Santana Castellón's current day-to-day includes his role as director of UdeG's upcoming El Museo de Ciencias Ambientales (MCA) — or the Museum of Environmental Sciences— a one-of-a-kind natural history museum that brings together western Mexico's environmental past, present, and future.

The museum's concept was born from a proposal more than 30 years ago, and in 2001, formal planning began. Santana Castellón has been at the helm of its design for the past decade as the museum moves from concept to reality. The building that houses the museum, designed by Norwegian-American architect firm Snøhetta, will live in the university's cultural district. The building itself was designed to interact with and complement its urban surroundings, while also paying homage to Jalisco's natural landscapes.

"This friendship is one of the best examples of how the Wisconsin Idea expands internationally to benefit the world."

Inside the museum, which is nearing completion, visitors will find seven exhibition galleries with 200-some exhibits, lab and workshop spaces for school groups, an auditorium, and 12 themed rooftop gardens. "Unlike traditional natural history museums which are organized by classifications of plants and animals, or by ecosystems, whose definitions exclude humans," describes the MCA website, "this museum is organized by landscapes that are defined by their cultural use of spaces."

Rendering of the El Museo de Ciencias Ambientales. The museum's mission is to "understand the city and inspire the conservation of nature that sustains it." Image courtesy of Universidad de Guadalajara

For example, a stroll through la Sala Altiplano (Altiplano Gallery) will explore Mexican history and culture by looking at the stretch of desert extending between Guanajuato and Aguascalientes. "Hand in hand with a strong sensory experience, the change to a dry landscape will be perceived where flora and fauna, as well as human communities, have had to adapt to the hostile climate," the website explains. On the other hand, la Sala Ciudad (City Gallery) will combine multimedia and interactive elements to explore both successful examples of sustainability and "unsustainable conditions that require urgent and coordinated community action."

The MCA suffered a setback in August 2021 when the Jalisco governor pulled 140 million pesos from UdeG's previously approved budget to finish the construction the museum. "Publicity will help the cause to finish the museum," Santana Castellón said, and earlier this year, he returned to his alma mater to champion the cause by giving a lecture in conjunction with the UW's Latin American, Caribbean, and Iberian Studies program about the controversy and the relationship between museums and human rights.

Santana Castellón is a fierce defender of both the University of Guadalajara and UW–Madison— and he isn't the only thing that ties the two institutions together. In fact, they have a relationship that spans 40 years.

In 1979 — Santana Castellón's final undergraduate semester — UW botany professors Hugh Iltis and John Doebley coauthored a paper with several international partners, including Rafael Guzmán from UdeG. In addition to discovering a new species of disease-resistant corn (and making the front page of the *New York Times*), Iltis, Doebley, and Guzmán also learned the benefits of cross-border collaboration.

After four decades of partnership, the UW and the University of Guadalajara made their working relationship official in 2019, signing a new agreement to collaborate on socio-environmental projects. "This friendship is one of the best examples of how the Wisconsin Idea expands internationally beyond the boundaries of the state to benefit the world," Santana-Castellón said at the 2019 signing. "Although after four decades we might be calling the partnership the Jalisconsin Idea!"

Rendering of the El Museo de Ciencias Ambientales. The museum's courtyard will act as a chimney to release hot air, helping to keep the building cool. Image courtesy of Centro Cultural Universitario

Ask Andrea

Andrea Hicks

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

Question: I'm doing some back-to-school shopping, and I'm wondering about the environmental impact of buying new (or "new to me" clothing) and school supplies. Can you help?

Answer: August is often a time to purchase items for the new school year. I remember my excitement when I was younger at selecting a new pair of shoes for school. At the same time, there are environmental impacts associated with these purchases, and some different issues to consider when deciding what to buy.

Buying durable products with long lifetimes is one way to reduce the environmental impact of the raw materials and manufacturing of goods. Backpacks, an essential school staple, are a good example. Each year, the shelves are dotted with backpacks with the latest cartoon characters, which are ever so enticing to children (including my own!). The challenge is that these backpacks often only last for a semester at most due to the daily stress of transporting items to and from school. Investing a little more in a durable backpack, even though it may not have the "in" character on it, is better from an environmental perspective. For example, my son's backpack lasted him for several years, thus reducing the waste associated with multiple replacements. (I also got it on the clearance rack, but that is another story.)

Purchasing used goods and providing them with a second lifetime (or third!) is one way to reduce your environmental footprint, while also often providing a benefit to your wallet. Along with local thrift shops, there are also websites dedicated to the sale or bartering of goods. Purchasing secondhand goods keeps them in the economy longer, decreasing the need for new goods while also reducing environmental impact. For example, a pair of jeans has an environmental impact of 20 kilograms of carbon dioxide equivalents from the raw materials and manufacturing processes needed to produce them — about 60 percent of its lifetime environmental impact. The other 40 percent is associated with laundering and ultimate disposal at the end of life. For comparison, a McDonald's Big Mac has a carbon footprint of 2.35 kilograms of carbon dioxide equivalents.

In short, with respect to back-to-school shopping, purchasing durable products and using them for longer will help reduce their environmental impact. But the best way to reduce our environmental impact is really to reduce consumption and how much we own.

To submit questions for future columns, please email us at info@sustainability.wisc.edu.

EC Student Aspires to a Role in Conservation Planning Despite Facing Adversity

By Rachel Carrier

Carrie Lovelace at Estes Park, Colorado. Photos courtesy of Carrie Lovelace (2)

"Part of why I like this program so much is because it opened up a lot of doors for me and I can choose where I want to go..."

— Carrie Lovelace

Nelson Institute environmental conservation (EC) master's student Carrie Lovelace has persevered through some of life's toughest challenges while completing her degree. After beginning the program in summer 2020, Lovelace was diagnosed with Hodgkin's lymphoma, a form of cancer that affects the lymphatic system. Despite taking time off from the program to manage her health, Lovelace's passion for protecting the environment remains unwavering.

Lovelace was first introduced to the study of the environment while working towards her undergraduate degree at University of Wisconsin–Eau Claire. She studied political science with a minor in environment, society, and culture. Upon completing her undergraduate program in 2018, she accepted a position as an economic support specialist where she worked with elderly, blind, and disabled individuals to help them obtain social services and coordinate resources for them.

While she enjoyed her work in human services, Lovelace wanted to pursue her interest in conservation through the EC program. A few months into the program, she received her diagnosis. Following discussions with Meghan Kautzer, EC program manager, and Nathan Schulfer, director of international and professional programs, the best option for Lovelace was to take a leave of absence while undergoing chemotherapy and radiation.

"When I was ready to rejoin, Meghan and Nathan were beyond supportive," she recalled. "They were really with me throughout the whole process. They were emailing and video chatting with me throughout my treatment. Their support was wonderful."

After finishing treatment and reaching remission, Lovelace rejoined the program in fall of 2021 with a new cohort of students. Of the many transitions Lovelace needed to make, she noted the pivot from starting as a fully virtual student to being in person this year as both exciting and a good learning experience.

"The transition back into the program went pretty smoothly," Lovelace said. "The cohort I joined was very welcoming and helped make that transition to in-person learning much easier."

Lovelace noted that the program feels very well-rounded, emphasizing technical skills in geographic information systems (GIS) and conservation planning, as well as communication skills applicable to the field. She sees the program as a challenging but exciting opportunity to develop and refine her skills before entering her career.

"I'm enjoying the challenges of learning about GIS," she explained. "I didn't have any background knowledge [of GIS] going into this program and I really like learning and working through the challenges of picking up the skills."

Lovelace explained that the technical aspect of GIS was the biggest hurdle to overcome, as she had little experience learning about technical systems prior to taking classes at the Nelson Institute.

Outside of the classroom, Lovelace is keeping busy by assisting Jessica Price, the City of Madison's sustainability and resilience manager, in a sustainability project. Part of Mayor Satya Rhodes-Conway's Climate Forward Agenda includes improving energy efficiency in naturally occurring affordable housing, or NOAH. Energy efficiency upgrades in NOAH saves energy, reduces greenhouse gas emissions, and lowers utility bills for low-income residents. Currently, the city works with two local non-profit partners, Sustain Dane and Elevate Energy, to provide energy efficiency upgrades in 100 NOAH units through the Efficiency Navigator program.

This summer, Lovelace is conducting research and policy analysis to help the City of Madison develop a strategic path to scale up and sustain this work. Lovelace is comparing policy strategies from cities across the U.S. that focus on improving energy efficiency in NOAH or similar housing stock and characterizing the state policy framework within which the city's program must fit. Lovelace will provide recommendations for programs or policies that help advance energy efficiency in NOAH in the City of Madison.

Carrie Lovelace enjoying the outdoors in Madison.

"We're so lucky to have Carrie on the team this summer. Carrie is helping us learn from other cities, understand the elements of successful energy efficiency policies and programs, and make strategic decisions," said Jessica Price. "I'm excited to see where she takes this project!"

Lovelace hopes to bring about conservation and environmental resilience at the city or regional level in her future work. Further, she sees value in emphasizing environmental justice and representation in decision making to environmental issues, two core values she has gained through her time at the Nelson Institute.

"Part of why I like this program so much is because it opened up a lot of doors for me, and I can choose where I want to go from here in a much broader sense because of what this program has taught me," Lovelace said. "I'm very open to where my future takes me."

Learn more about the environmental conservation MS and how you can support the program.

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!

2022 Alumni Award Winners Announced

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

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

Please join us in congratulating this year's alumni award winners!

Rising Star Alumni Award

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

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

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

Distinguished Alumni Award

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

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

Ashok Sarkar PhD'97
Senior Energy Specialist, World Bank

Stay tuned for our September issue for full profiles of our six awardees.

You're Invited!

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

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

We invite you to stay connected by updating your contact information, by joining Badger Bridge, or making simple updates here.

Calling all WSB-NI alums!

This fall, the Nelson Institute is teaming up with the Wisconsin School of Business to bring you a brand-new event — Planet, People, Profit: Careers in Corporate Sustainability on Tuesday, Sept.13, 5:30–6:30 p.m. Hear from alumni as they share their experiences, offer career tips, and discuss the future of sustainability in business. Register today for either in-person or virtual attendance! Questions? Contact Emily Reynolds for more information.

Release of Earth Day Learning Event Videos

Thank you to everyone who helped to make the 2022 Earth Day learning event a success.
If you missed the event or a particular session, the Nelson Institute is pleased to share these videos:

- The Colorado River Compact at 100
- The Okavango Delta: Opportunities for Regional Cooperation
- Tribal_University Partnerships for Wild Rice Revitalization in the Western Great Lakes
- Water for Food: Too Much or Not Enough?
- Water, Water, Everywhere, in the Air, in the Ice, in the Ground, and in the Sea: A Conversation About the Science of the Changing Global Water Cycle
- Water@UW: Addressing Wisconsin's Water Challenges
- Working Together to Improve Wisconsin's Water: How Community-University Partnerships Catalyze Water Quality Projects in Wisconsin

View the Nelson Earth Day program archives. Learn more about how you can support future Earth Day events.

Weston Series

The Weston Roundtable Series is designed to promote a robust understanding of sustainability science, engineering, and policy through weekly lectures co-sponsored by the Center for Sustainability and the Global Environment (SAGE), the Department of Civil and Environmental Engineering, and the Office of Sustainability. The spring series is complete, but past lecture recordings are available for viewing.

CPEP
CLIMATE, PEOPLE AND THE ENVIRONMENT PROGRAM

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 seminar presentations are held in conjunction with the Department of Atmospheric and Oceanic Sciences and are open to the public. The spring series is complete, but past lecture recordings are available for viewing.

KEEP UP TO DATE ABOUT UPCOMING ENVIRONMENTAL EVENTS

Nelson Video Library

A video library of past lectures is available on demand. If you missed a Nelson Institute hosted event or lecture, you can view recordings in our video library.

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