May 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

Earth Day Learning Event

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Nelson celebrates new alumni
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Reimagining our Relationship with Water keynote speaker Kelsey Leonard, Canada Research Chair in Indigenous Waters, Climate and Sustainability, University of Waterloo. Photo credit: Kevin Berger

Pictured above clockwise:

1: Prior to the keynote address "Reimagining our Relationship with Water" (left-right): Paul Robbins, Dean, Nelson Institute for Environmental Studies, Sandra Postel, Director, Global Water Policy Project and 2021 Stockholm Water Prize Laureate, Kelsey Leonard, Canada Research Chair in Indigenous Waters, Climate and Sustainability, University of Waterloo, Mandela Barnes, Lieutenant Governor, State of Wisconsin Photo credit: Kevin Berger

2: The in-person learning session: "The Okavango Delta: Opportunities for Regional Cooperation" with Nyambe Nyambe (left), executive director, KAZA TFCA Secretariat, Nathan Schulfer, Director, International and Professional Programs, Nelson Institute for Environmental Studies. Photo credit: Kevin Berger

3: Reimagining our Relationship with Water keynote speaker Sandra Postel, Director, Global Water Policy Project and 2021 Stockholm Water Prize Laureate. Photo credit: Kevin Berger

4: The in-person learning session: "Water, Water, Everywhere, in the Air, in the Ice, in the Ground, and the Sea: A Conversation About the Science of the Changing Global Water Cycle" with (left-right) Steve Vavrus, senior scientist, Nelson Institute Center for Climatic Research, University of Wisconsin-Madison, Andrea Dutton, professor, Department of Geoscience, University of Wisconsin-Madison, Till Wagner, assistant professor, Department of Atmospheric and Oceanic Sciences, University of Wisconsin-Madison, Daniel Wright, assistant professor, Department of Civil and Environmental Engineering, University of Wisconsin-Madison, Madeline Magee, water resources management, Wisconsin Department of Natural Resources. Photo credit: Anica Graney

5: The in-person learning session: "A Half Century of Environmental Cooperation: The U.S.-Canada Great Lakes Water Quality Agreement" with Mic Isham (left), executive administrator, Great Lakes Indian Fish & Wildlife Commission, Sumudu Atapattu, director of research centers, University of Wisconsin-Madison Law School. Photo credit: Kevin Berger

6: Water on the Rise "Confluence" showcased art works from 14 UW-Madison students participating in the Flow Project. Photo credit: Kevin Berger

Nelson Earth Day learning event addresses water

Thank you to all those who joined us for the Nelson Institute 2022 Earth Day learning event titled "Water on the Rise." More than 1,000 people from around the world attended both live and virtual sessions on April 21 that explored a range of topics centered around water. The annual event represented participants from 10 countries (Brazil, Canada, Denmark, Germany, Malaysia, Mexico, Nigeria, Sweden, Turkey, and Uganda), 43 U.S. states plus Washington, D.C., and 38 Wisconsin counties.

The closing plenary, "Reimagining our Relationship with Water," featured speakers Kelsey Leonard a water scientist, legal scholar, policy expert, writer, and enrolled citizen of the Shinnecock Nation and Sandra Postel the director of the Global Water Policy Project and 2021 Stockholm Water Prize Laureate. They presented current examples and thought-provoking ideas of how we can shift our paradigms and how new solutions will impact our relationship with water.

Prior to the speakers taking the stage, State of Wisconsin Lieutenant Governor Mandela Barnes recognized the efforts of the Nelson Institute and commended the continued committee to educate and engage on environmental topics and challenges.

We are grateful to all the speakers who shared their expertise and to all our partners who supported this event.

Watch for follow-up information regarding the release of videos from the event.

1,000+ PARTICIPANTS INTERNATIONALLY

43 U.S. STATES

38 WISCONSIN COUNTIES

SOCIAL IMPRESSIONS **17,566**

Roaring back!

The last few years have been complicated for everyone, and the adjustments, upheaval, and real hardship for Nelson Institute students, faculty, and staff will mark my own memory forever. The issues we are facing on land, sea, and climate, however, never went away. Throughout this whole period, the Nelson community continued to work on issues confronting the planet, bringing a new generation of leaders forward, and facing the pubic with thoughtful engagement.

That makes the achievements of 2021-2022 all the more exciting and inspiring. After stretches of quarantines and sickness, and becoming better informed by public protests and reflection, the achievements this year are especially notable. In this issue of *The Commons*, you'll only hear about a few of them, but they are remarkable.

The Center for Climatic Research is world-renowned for paleoclimate research, downscaling global climate models, and advancing our understanding of terrestrial-atmospheric interactions and dynamics. But it's diverse personnel always does so with a Wisconsin Idea dedication to public engagement and service. CCR Interim Director Michael Notaro's "The Sky's the Limit STEM Camp," is a paramount example. Working with the Welty Environmental Center, the School District of Beloit, Beloit College, and Achieve Collaborative Treatment (ACT), Notaro secured NSF support to support autistic kids in STEM learning. That is a project of enormous vision.

The 2022 Carnegie Fellowship was awarded to only a handful of luminaries and change-makers. Among them, Monica White, Nelson Institute Gaylord A. Nelson Distinguished Chair in Integrated Environmental Studies, and the founding director of the Office for Environmental Justice in the Nelson Institute for Environmental Studies, whose groundbreaking work on the relationship between agriculture, community, and Black freedom struggles puts her on the cutting-edge of where food politics can and should go, based on its long – though sometimes submerged – histories of innovation and change. This award was a big deal for this Institute and the University of Wisconsin–Madison. Dr. White will leverage the opportunity in her continued outreach to connect this campus with diverse communities around the country.

This was topped off by Earth Day 2022. We all know this is the global destination for the study of freshwater, its ecology, hydrology, or sociology. And Earth Day 2022 was flooded with a vast breadth of sessions that addressed all of these and more. Attended by 1000 people from 10 countries, 43 US States, and 38 Wisconsin counties, "Water on the Rise" did not simply announce a vague environmental imperative, instead it was a practical invitation to see and do things in new, specific ways. I was especially inspired by the "Reimagining our Relationship with Water" keynotes. Sandra Postel showed pragmatic approaches to deal with our contradictory water issues amidst climate change (too much water and too little) while Kelsey Leonard of the Shinnecock Nation showed us how water itself (streams, rivers, and lakes) could and should obtain legal standing. This latter revelation was not the least bit speculative; a host of legal precedent shows incredible legal innovation in this space. Stay tuned, coming soon to a courtroom near you.

So, this year we saw full classrooms, a bustling campus, a multitude of new activities and ideas, and a redoubled commitment – especially by our students – to getting things right on the environment, and getting them right, *right now*. I look forward to a beautiful Wisconsin summer and to the Nelson Institute coming back in 2022-2023 with even more energy and innovation.

Paul Robbins
Dean, Nelson Institute

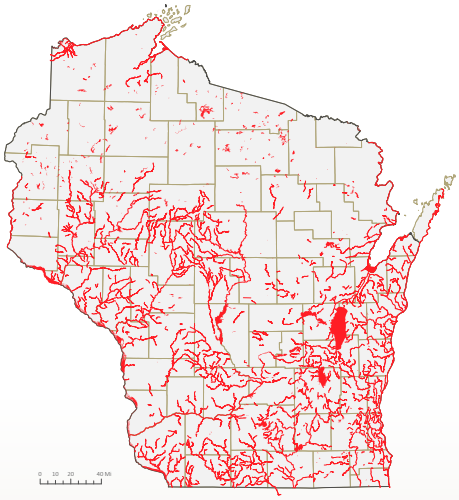
Algae growing in Lake Monona during an algal bloom in summer of 2021. Photo credit: Tracy Campbell

Nutrient pollution in surface waters is focus for latest Nelson Issue Brief

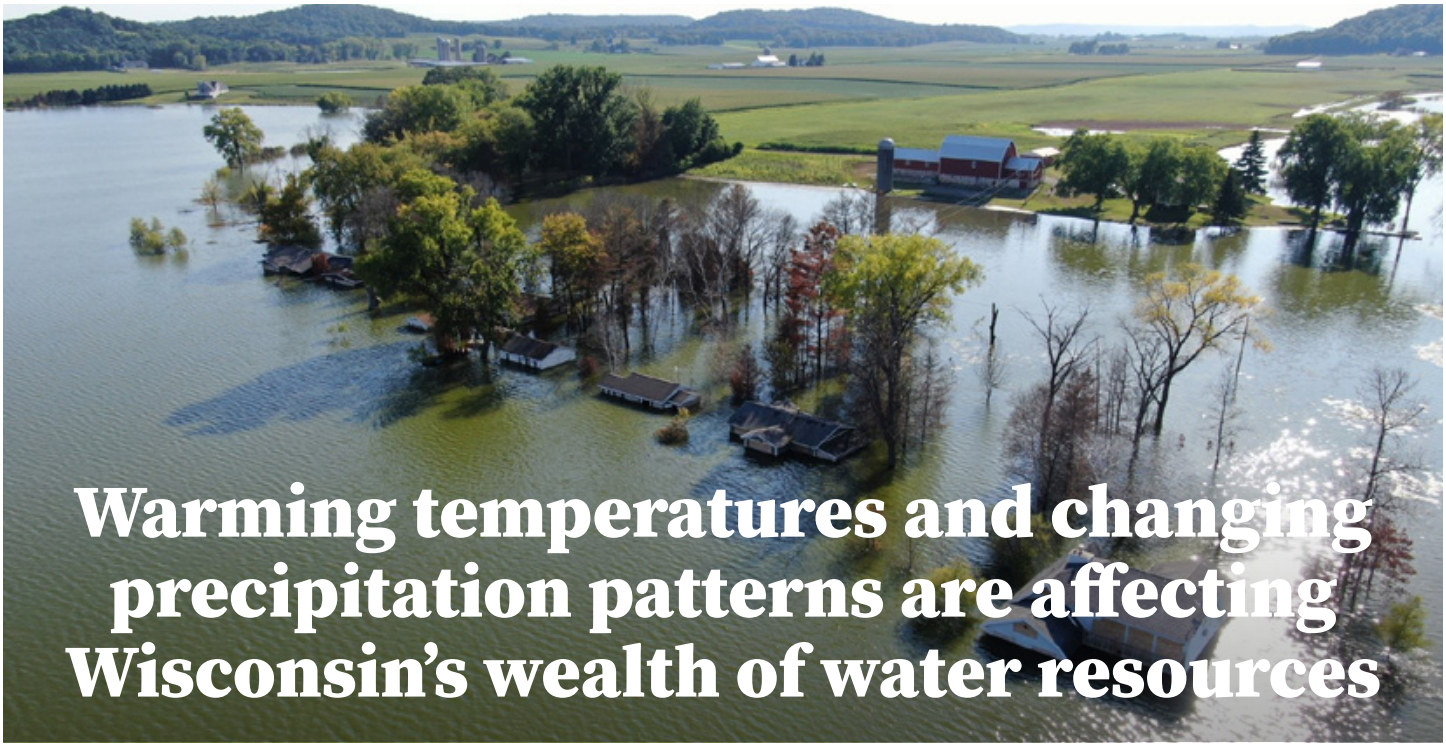
The Nelson Institute Issue Brief summarizes and conveys up-to-date scholarship from across the UW–Madison campus on key issues of environmental concern. The latest edition of the Nelson Issue Brief focuses on nutrient pollution in surface waters. In particular, researchers share insight into if algal blooms in lakes are getting worse, the role neighbors play in cleaning urban stormwater, seasonal forecasting of harmful algal to improve beach and lake management, effectiveness of regulations on surface runoff pollution as it relates to Wisconsin dairy farms, expansion of perennial grassland as a pathway to water quality improvement in the Yahara River Watershed, and exploring Wisconsin's innovative water quality nutrient trading options.

View the latest Issue Brief (pdf)

View previous Issue Briefs



Waters classified as 'Impaired' under the Clean Water Act. Credit: UW–Madison Cartography Lab



Warming temperatures and changing precipitation patterns are affecting Wisconsin's wealth of water resources

Average precipitation and storms delivering large amounts of water in short periods of time are increasing in Wisconsin, and both can result in flooding problems. June 2020 photo showing flooded homes along Fish Lake's former western shoreline. Photo credit: Ted Bier

By Dea Larsen Converse

A recently released report on climate impacts to water resources in Wisconsin from the Wisconsin Initiative on Climate Change Impacts (WICCI) shows that warming temperatures and changing precipitation patterns are impacting Wisconsin's wealth of water resources.

"The warming climate is having an impact on water resources in Wisconsin. We need to increase the magnitude and urgency of actions to protect and restore habitat and enhance water quality to make Wisconsin's waters more resilient to climate change."

–Katie Hein, WICCI Water Resources Working Group Co-Chair

A group of experts participating in the WICCI Water Resources Working Group found that rising air temperatures, more precipitation from fall to spring, and more frequent and larger extreme precipitation events are climate impacts affecting Wisconsin's lakes, streams, groundwater and wetlands. Wisconsin's average daily temperature has become three degrees Fahrenheit warmer since the 1950s. Precipitation has increased 17 percent, about five inches, since 1950. The last two decades have been the warmest on record and last decade was the wettest.

Water levels and flooding

The group found that as average precipitation and storms increase in Wisconsin, they are delivering large amounts of water in short periods that result in flooding problems. Areas with permeable soils are especially vulnerable to groundwater flooding, which occurs when the water table comes above the land surface after periods of higher-than-average precipitation. This type of flooding occurs around lake shorelines, in wetlands, and in other areas where the water table is near the surface. Stream flooding associated with large storms is also a concern, causing damage to infrastructure, habitat loss, and risks to human health. The fast-flowing water during floods increases erosion and can also cause deep channels to form that intensify the flow of stormwater. These channels further reduce flood storage, degrade water quality, and increase downstream flooding.

Climate models project a decline of 68 percent in stream habitat for brook trout. A brook trout (Salvelinus fontinalis) captured from a Driftless Area stream. Photo credit: Matthew Mitro

Water quality
The group also found that warmer water temperatures combined with more runoff from extreme precipitation events threaten water quality. In built areas with large amounts of impervious surface, runoff receives little natural filtration, enabling sewage overflows and a wide variety of pollutants to reach surface waters. Statewide, nutrient runoff from agricultural lands is a major water quality issue that fuels algal blooms. Erosion and sedimentation are also a concern in many areas, including forested lands.

Warming water temperatures
In addition, the group found that as lake water temperatures have warmed overall, the risk of fish kills and toxin-producing algal blooms is increasing. As the air temperature continues to warm, lake surface water temperatures in all lakes will also warm, changing lake ecology. Fewer lakes will be able to support cool-water fish like walleye and warm-water fish like largemouth bass will be much more common as waters warm by mid-century.

Impacts on communities
While all communities in Wisconsin are at risk from flooding and changes in the natural communities, historically disadvantaged communities bear a disproportionate burden and suffer the greatest harms. For example, Wisconsin tribes that rely on wild rice beds, fish, and wildlife stressed by climate change are particularly at risk. The Bad River Reservation on the south shore of Lake Superior has seen impacts to tribal wild rice harvests from unprecedented flooding events and water level fluctuations in the past decade on the Kakagon and Bad River Sloughs, large healthy freshwater estuaries.

Solutions
The WICCI Water Resources Working Group suggests solutions to prepare for and minimize climate impacts to water resources, like increasing water storage across the landscape, installing green infrastructure, protecting wetlands, building outside of flood zones, and installing flood warning systems. Visit the Water Resources Working Group webpage to learn more about these issues, impacts, and solutions.

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, include faculty, staff, and student recruitment, retention, and morale.

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

This article is the first in a series that will highlight the contribution from each WICCI Working Group for the 2021 WICCI Assessment Report.

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

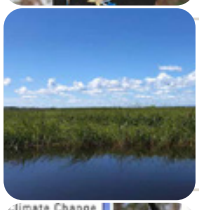
Feature

Water Resources Working Group - Stories

In northern Wisconsin multiple record rainfall events since 2012 have washed out roads and bridges and contributing to massive algal blooms on Lake Superior. Communities in the region that thought they would be immune to climate change are concerned and are banding together to try to meet the challenges.

Climate impacts in northern Wisconsin

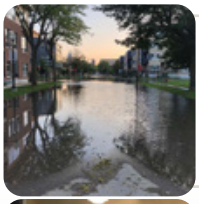
Climate impacts on tribal nations



Insights on climate from the Bad River Band of Lake Superior Tribe of Chippewa

Wisconsin Great Lakes Indian Fish and Wildlife Commission Member Tribes Focus on Climate Change

Since 1950, the southern two thirds of Wisconsin has experienced the biggest increase in precipitation in Wisconsin. Roads, bridges, culverts, and stormwater structures not built for the increasing volume and intensity of precipitation are contributing to damaging floods and increasing health risks.



Flooding in southern Wisconsin Lakes

Climate impacts to communities in Milwaukee

Robbins accepts reappointment

Paul Robbins

Toward the end of their five-year contract period, all UW–Madison deans undergo a comprehensive review to assess their academic and administrative leadership and performance. The reviews include interviews with faculty, staff and students, and with external stakeholders.

A committee appointed last fall by Provost Karl Scholz recently concluded the review process of Dean Paul Robbins. Robbins has received feedback on the results of the review and has agreed to another five-year term as dean of the Nelson Institute for Environmental Studies.

"Serving in this position is a tremendous honor. It's also a chance to take the incredible things that the faculty, staff, and students have achieved here at Nelson in the last decade and send them into joyful overdrive for the next five years. This campus is poised to serve more diverse publics, solve more environmental problems, attract more friends, donors and grants, and support more parts of our own campus. I'm hugely excited," said Nelson Institute Dean, Paul Robbins.

Robbins, a UW–Madison alumnus with a bachelor's degree in anthropology, also has a master's and doctorate in geography from Clark University. He became director of the Nelson Institute in 2012 and dean in 2017.

Three other deans also completed reviews and accepted renewal of their appointments. They are: School of Medicine and Public Health Dean Robert Golden, School of Veterinary Medicine Dean Mark Markel, and School of Human Ecology Dean Soyeon Shim.

Chancellor Rebecca Blank and Provost Karl Scholz expressed their appreciation to the chairs and members of the four dean review teams and to all who contributed their input to the reviews of these outstanding academic leaders.

Monica White is Distinguished Chair of Integrated Environmental Studies and the founding director of the Office for Environmental Justice in the Nelson Institute for Environmental Studies. Photo credit: Bryce Richter

Monica White awarded Carnegie Fellowship

Monica White — Nelson Institute Gaylord A. Nelson Distinguished Chair in Integrated Environmental Studies, and the founding director of the Office for Environmental Justice in the Nelson Institute for Environmental Studies — has been awarded a prestigious Andrew Carnegie Fellowship.

White will use the $200,000 award to complete the research and writing of her second book, *We Stayed: Agriculture, Activism, and the Southern Black Rural Families Who Fought to Keep the Land*. The book focuses on three generations of an Alabama family who, instead of moving north in the Great Migration, stayed in the South farmed the land, and used their long-standing community connections to help lead the civil rights movement.

"Congratulations to Monica for earning a Carnegie Fellowship," says UW–Madison Chancellor Rebecca Blank. "Monica's work is a significant contribution to our understanding of Black history. I'm very pleased that her work is being recognized through this award."

White is Distinguished Chair of Integrated Environmental Studies and the founding director of the Office for Environmental Justice in the Nelson Institute for Environmental Studies. Her research focuses on Black, Indigenous

"So much of the scholarship around the Great Migration concentrates on families like mine who left the South. I think there's been insufficient attention on the Black families who stayed and the institutions that they created in order to stay."

–Monica White

and Latinx community-based food systems that provide food security, sovereignty and social solidarity.

"So much of the scholarship around the Great Migration concentrates on families like mine who left the South. I think there's been insufficient attention on the Black families who stayed and the institutions that they created in order to stay," says White, who also holds a joint appointment in the Nelson Institute and the Department of Community and Environmental Sociology in the College of Agricultural and Life Sciences. "These families offer us an example of how they were able to stay by engaging in agriculture, but also in activism. And they saw the two as wed together and closely connected."

White's first book, *Freedom Farmers: Agricultural Resistance and the Black Freedom Movement*, was published by UNC Press in 2019. The book documents how Southern Black farmers turned to agriculture as a means of resistance and how this history inspired modern food justice movements in cities.

"Food. Food is where it all comes together: justice, climate change, water quality, urban livability. What Monica White has done on food is to not only restore its rich history, but to show how it thrives now. Her work on the relationship between social progress and tilling the soil has shown how Black communities carried agriculture from the deep south to the north, to places where we all know, like Milwaukee and Detroit. But she's also shown that this is where farming remains today, doing positive social work, building communities, cleaning the land, the soil, and the air. If there is a reason to honor a scholar with a Carnegie, that pretty much is it," said Nelson Institute Dean Paul Robbins.

The Carnegie Corporation of New York awards the Carnegie Fellowships to provide distinguished scholars in the social sciences and humanities the support they need to complete important research in their fields. In 2022, the corporation selected 28 fellows from nearly 300 nominations.

Conference honors teaching, legacy, and environmental studies advocacy of William Cronon

Bill Cronon

A day-long conference, "Common Places: Keywords for a More Than Human World," in April honored Professor Emeritus William Cronon, who held the position of Frederick Jackson Turner and Vilas Research Professor of History, Geography, and Environmental Studies at the University of Wisconsin–Madison before his recent retirement.

Organized by Cronon's former PhD students, the gathering featured a special keynote address by Cronon and presentations written in Cronon's honor by former students. Panel discussions focused on the shifting cultural meanings of keywords that have guided their mentor's thinking about nature, space, and history, in the tradition of Raymond Williams' classic book Keywords: A Vocabulary of Culture and Society.

After having served for more than a decade as a member of the Yale History Department, in July 1992 Cronon became the Frederick Jackson Turner Professor of History, Geography, and Environmental Studies at the University of Wisconsin–Madison. In 2003, he was named Vilas Research Professor at UW–Madison, the university's most distinguished chaired professorship.

Cronon was a founding faculty fellow of the Nelson Institute's Center for Culture, History, and Environment (CHE), the multidisciplinary environmental research unit created in 2006, and served as its director from 2007–11. Read more

Joshua Calhoun, associate professor in the Department of English at the University of Wisconsin-Madison, gives a lecture during his English 162 course "Why Shakespeare?" in Mills Music Hall, room 2340 of the Mosse Humanities Building on April 5, 2022. Calhoun is the recipient of a 2022 Distinguished Teaching Award. Photo credit: Althea Dotzour / UW-Madison

Joshua Calhoun receives distinguished teaching award

Joshua Calhoun, associate professor of English and faculty associate in the Center for Culture, History, and Environment, is among only a dozen faculty members across campus selected to receive a Distinguished Teaching Award. The long-standing annual award has honored the university's finest educators since 1953. Calhoun received the William H. Kiekhofer Teaching Award and was honored with fellow recipients at a ceremony on April 19.

CCR interim director's work to develop STEM summer camp featured in Beloit Daily News

"My perspective is we don't see autism or neuro-divergence as a bad thing."

–Michael Notaro

Michael Notaro, interim director and senior scientist with the Center for Climatic Research, was recently highlighted in an article in the Beloit Daily News where he shared information about an NSF grant that is supporting development of a STEM (science, technology, engineering, and mathematics) camp for autistic students.

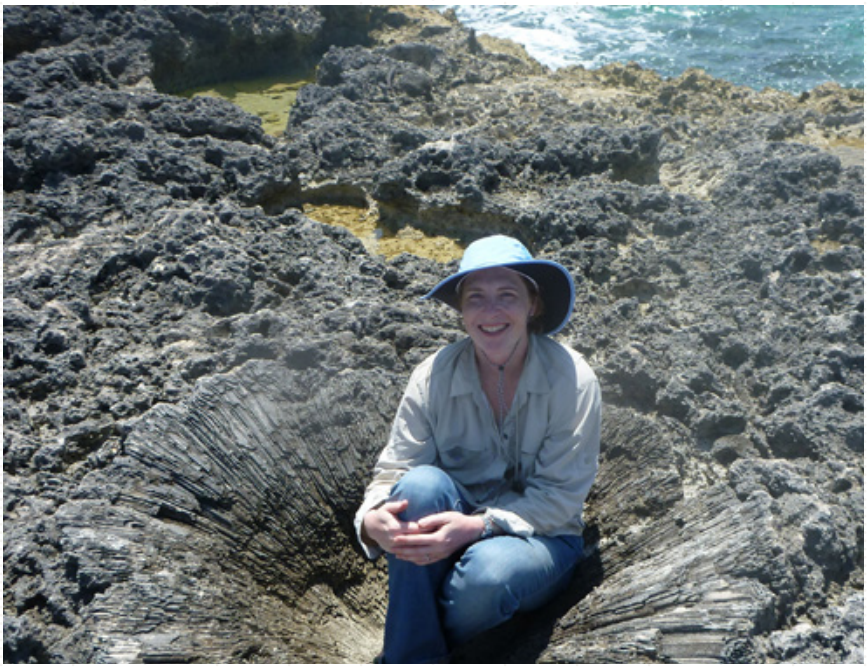
The Nelson Institute Center for Climatic Research partnered with the Welty Environmental Center, the School District of Beloit, Beloit College, and Achieve Collaborative Treatment (ACT) to develop The Sky's the Limit STEM Camp.

"This is a very unique camp because it's something that's very rare and it's been developed as this opportunity for autistic kids to create an environment in which they can really thrive in learning STEM and participate in outdoor learning," Notaro said.

During the seven-week camp, attendees will participate in a range of nature-based, hands-on learning opportunities including hiking, learning how to be a citizen scientist, driving a TerraRover, collecting water samples, and a tour of Beloit College. Read more

Andrea Dutton participates in White House roundtable on climate action

By Bekah McBride



Dutton in an eroded fossil coral form in the Bahamas. Dutton uses fossil corals to reconstruct the past position of sea level through time. Photo courtesy of Andrea Dutton

Nelson Institute affiliate and Department of Geoscience Professor Andrea Dutton recently participated in a White House Office of Science and Technology Policy roundtable on climate action. The virtual event, "White House Climate Science Roundtable on Countering 'Delayism' and Communicating the Urgency of Climate Action," brought together experts from a variety of fields to discuss why arguments to delay climate action gain ground and how to better counter such arguments.

"The goal of this roundtable was for high level White House staff to learn from scientists and other experts to share a scientific understanding..."

–Andrea Dutton

Dutton, who studies climate and sea-level change using carbonate sedimentology and isotope geochemistry, was invited to share her expertise as a part of the panel. She highlighted her research program, which focuses on understanding the rates, magnitudes, sources, and drivers of past sea-level change to facilitate improved understanding of the climate system and of projections for the future.

"The goal of this roundtable was for high level White House staff to learn from scientists and other experts to share a scientific understanding of why arguments for delaying action are appealing, what impacts that delay would have, and how to counter these arguments effectively," Dutton shared. "Many of those who attended have an extensive portfolio of public outreach and communication on climate change."

Dutton brought many years of research and teaching experience to the panel. While much of her career has been in higher education, she shared that it was her role as a science teacher for third through 12th graders in New York that helped her to effectively communicate about climate change.

"My time spent teaching at St. Ann's was critical to the development of my public speaking skills and learning how to effectively pitch content at different levels," Dutton said. "I think this has really helped me to be an effective communicator on issues related to climate change with public audiences."

Today, Dutton continues to teach several large, introductory level courses at the University of Wisconsin–Madison, including introductory to geology and oceanography. She is also overseeing construction of a new lab where she will perform radiometric dating of carbonates such as fossil corals and cave formations to help reconstruct past changes in sea level and climate. Additionally, she is continuing her fieldwork which she says is one of the most exciting parts of her career.

"One of my favorite field sites is in the Seychelles, where we found some small, but extremely revealing outcrops of fossil reefs that produced an extraordinary amount of information about past sea level rise in the region," Dutton said. "Some of the observations we made at this site led to the upwards revision of our estimates of how high sea level rose during the most recent past warm period and have had a big impact on subsequent research on this topic." Read more

Nelson Institute Dean Robbins featured in BBC story

Nelson Institute Dean Paul Robbins' research on lawns was featured in a recently published BBC article, "Why Lawns May Have Had Their Day." The article shares research and perspectives on the historical, environmental and health risks, economics, and ecological impact of maintaining a lawn.

"Lawns are a reflection of the fact we're socialized to keep up appearances, to be cohesive with the community. Those who spray chemicals are more likely to know their neighbors by name."

–Paul Robbins

The article references information from Robbins' book, *Lawn People: How Grasses, Weeds, and Chemicals Make Us Who We Are*, which includes an investigation into the ecological, economic, and social context that drives lawn care in the United States. In a 2001 study, Robbins found that those who use pesticides on their lawns tend to be more educated, have higher incomes and are more likely than non-pesticide users to recognize the environmental damage of their actions. In addition to leading national studies of consumer chemical risk behavior, Robbins' research also addresses conservation conflicts, urban ecology, and environment and health interactions.

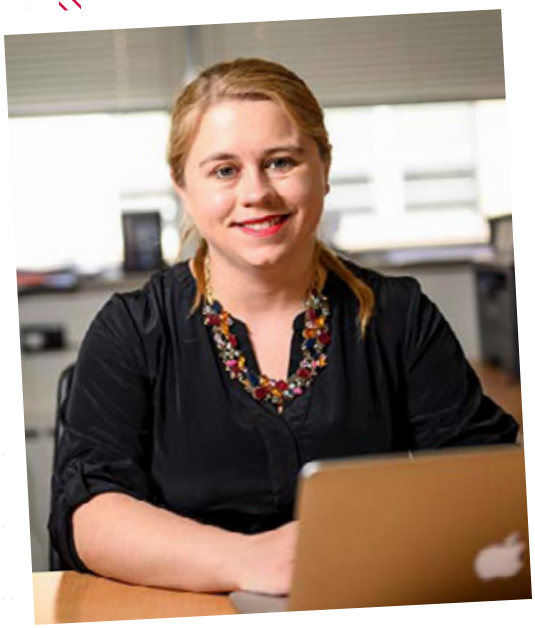
In California, lawns are estimated to swallow up around 40% to 60% of all the domestic water used. Photo credit: Getty Images

Golf course lawns may have contributed to the current focus on achieving a perfect green carpet. Photo credit: Getty Images

Among Robbins' comments for the story, he noted the increase in the number of requests he receives to speak on this topic may indicate that lawns may now be controlling us.

The article is part of the BBC's 21st Century Gardening series and explores how it can be updated to fit with modern sensibilities and challenges, such as environmental awareness and pollution. Read more.

From the desk of Andrea Hicks



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

Reflecting on Earth Day

Earth Day provides an opportunity to celebrate how far we have come in understanding and attempting to mitigate anthropogenic effects on the earth. The history of Earth Day spans the decades since its inception in 1970, and includes our own late Senator Gaylord Nelson, for whom this institute takes its name. Some may be surprised to learn that the first incarnations of Earth Day were environmentally focused teach-ins, with a goal of citizens demanding action from themselves and their elected officials. Earth Day, although commonly characterized now by activities such as litter pick-ups, was a radical event. As recalled by Dennis Hayes, who assisted in organizing the first Earth Day, "This was talking about fundamental changes in the nature of the American economy."

While I appreciate Earth Day and all that it has come to signify, more often than not it merely reminds me of how far we still need to go. I think about the agenda we must set for the present and the future and the actions we must take to ensure a habitable world for all creation.

We need to stop thinking of reducing our environmental impact as an add-on or as a burden to our business-as-usual existence. Taking action to combat climate change, prevent environmental degradation, and right a myriad of social wrongs is, instead, fundamental to our future survival. To borrow a phrase from McDonough and Braungart in their 2006 book *Cradle to Cradle*, we need to stop thinking about how to be "less bad" and instead of how to be "all good." That means thinking about how to produce products and do business in a manner that is nourishing for the planet.

In engineering, my disciplinary home, we often say that the time to have the greatest influence on a product's design is at the beginning, because that is where the most degrees of freedom exist. We as a society must start incorporating the considerations of sustainability at the beginning of the decision or design process, not as an afterthought.

At the Office of Sustainability, we work to foster the future sustainability leaders of UW–Madison and beyond. We do this through our paid student intern program, where students work to make their campus community more sustainable. We do this through the Green Fund, where students propose and execute projects that embody all three paradigms of sustainability. We do this through collaboration with the Nelson Institute for Environmental Studies, by offering students formal sustainability credentials through the undergraduate sustainability certificate program.

We invite you to join us in working to create the future leaders for the world we need.

Nelson Institute students and faculty earn top spot in global XPRIZE challenge

UW-Madison XPRIZE team includes, from left, graduate students Seunghyeon Jung, Mattie Bindl, Mikhaila Calice, Jenna Greene, Keerthana Sreenivasan and Eri R. Amezcua. Photo courtesy of Keerthana Sreenivasan

Nelson Institute faculty and students are part of the University of Wisconsin–Madison team Earth RepAIR and among the top 60 groups, and one of only 21 teams focusing on direct air capture, in the XPRIZE competition, a $100 million global challenge funded by Elon Musk and the Musk Foundation.

"Everyone has that goal that we can and we should do something about what's happening to the earth and everyone believes in our project and our technology."

–Keerthana Sreenivasan

Teams eligible for the milestone award were required to demonstrate a working carbon dioxide removal solution, estimate its cost at full scale, and develop a plan for scaling and deploying their solutions at the megaton- and gigaton-per-year capacity. As a top-60 team, Earth RepAIR will receive support in a variety of areas, including legal, business, investment, demonstration sites and others, from XPRIZE.

The UW–Madison solution is an integrated system built around concepts pioneered by Bu Wang, an assistant professor of civil and environmental engineering in the College of Engineering, Rob Anex, a professor of biological systems engineering in the College of Agricultural and Life Sciences, and a dozen undergraduate and graduate students in engineering, CALS, the College of Letters and Science and the Nelson Institute for Environmental Studies. Team members with a Nelson connection include Mattie Bindl, Environment and Resources and Energy Analysis and Policy, Jenna Greene, Master of Public Affairs and Energy Analysis and Policy, and Isaac Eskind, a December 2021 graduate in business and environmental studies.

The challenge is aimed at fighting climate change and rebalancing Earth's carbon cycle — a critical need for action underscored in an April 2022 report issued by the Intergovernmental Panel on Climate Change. The multiyear, multistage competition concludes Earth Day 2025.

In fall 2021, Earth RepAIR also earned $250,000, the largest available award in the XPRIZE student competition. The funding, along with support from the Wisconsin Alumni Research Foundation, enabled team members to advance the technology so that it can efficiently and effectively capture a gigaton of carbon dioxide with the lowest cost possible. That also includes working with a third-party company to verify their system works. Read more

Nelson Institute student completes dual-degree program in Water Resources Management as a "triple badger"

Rajpreet Grewal in Zion National Park, Utah (December, 2020). Photo courtesy of Rupinder Grewal

By Rachel Carrier

Nelson institute graduate student Rajpreet Grewal looks to advocate for fair water management practices through law and policy as the "triple badger" completes the dual-degree program through the Nelson Institute. Her exploration in water management began at the University of Wisconsin–Madison as an undergraduate student and continues through her participation in the Water Resources Management MS program.

"I was able to develop a connection with my cohort members that I don't think I would be able to have elsewhere."

–Raj Grewal

Grewal graduated from the University of Wisconsin–Madison in 2018 with a degree in environmental science and certificate in sustainability. She explored topics in public policy through her undergraduate program and found herself drawn to how law, policy, and environmental issues are interconnected. Following a gap year, Grewal returned to Madison for the dual-degree program in Water Resources Management (WRM) and Doctor of Juridical Sciences. Grewal plans to complete the WRM program finish her law degree in spring 2023.

Rajpreet Grewal. Photo credit: Empire Photography.

Focusing on water management issues felt like second nature to her, as much of her academic career emphasized the importance of aiding water issues. Grewal was drawn from focusing on the hard-science aspects of environmental justice to taking a policy-driven approach in her environmental policy classes. She was intrigued by the various ways law and policy can influ-

ence major environmental issues.

Returning to the Nelson Institute for the dual degree program has allowed her to experience a wide range of professors, classes, and peers. She reflected on the many connections she made over the years within her programs. One of her favorite aspects of the Water Resources Management program was the closeness of her cohort.

"We had a cohort of six people and our dynamic of having a small group of people working towards meaningful goals was really powerful to me," Grewal said. "I was able to develop a connection with my cohort members that I don't think I would be able to have elsewhere."

Grewal's experience extends far beyond the classroom. She spent the summer working at the Wisconsin Department of Natural Resources as a law clerk. She engaged in research about resource issues impacting the local environment and produced reports on her findings. Although her summer work was mostly remote due to the pandemic, Grewal still gained valuable insight about her future from the position.

"The experience just really strengthened my desire to work at a government agency or an environmental nonprofit," she said.

Currently, Grewal works as a law clerk with Midwest Environmental Advocates. The nonprofit law center helps communities and groups facing environmental injustices connect with vital resources.

"It's been such a great experience working with [Midwest Environmental Advocates]," Grewal said. "The work is rewarding and I'm learning even more about the environmental issues Wisconsin faces."

As Grewal wraps up the dual-degree program, she reflects on her positive experiences within her respective programs.

"Everyone at the Nelson Institute has been extremely helpful and supportive, and the staff there has been vital to getting me through my master's program," she said. "Whenever I get stuck or need advice, I know I have so many people from the Nelson Institute to turn to."

Grewal expects to complete the dual degree program next year and hopes to work at a government agency or nonprofit organization upon graduation. Ideally, her goal is to start working in government at the state level and work her way up to a federal position.

Learn more about the Water Resources Management program and how you can support the program.

Rajpreet Grewal sitting at the Rocky Mountains, Colorado (December 2020). Photo courtesy of Rupinder Grewal

Day of the Badger – THANK YOU!

THANK YOU! We are grateful to all who participated in UW-Madison's Spring 2022 Day of the Badger. Together we raised a total of $13,063 for the Nelson Institute and spread a great deal of Nelson spirit and pride all around the world, as well. We are grateful to the following individuals for your support of the Nelson Institute and its continued success!

Samantha Alch
Jean M. Bahr
Andrew Baxter
Thomas L. Blumenberg
Kendra L. Bonderud
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William Buehring
Benjamin Callan
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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!

Congrats to our new alumni

On May 6, the Nelson Institute celebrated its 360 undergraduate and 51 graduate students who became alumni this spring. Faculty, staff, and friends of the Institute honored graduates and recognized scholarship recipients while enjoying a Wisconsin tailgate dinner at Memorial Union. If you missed the event, we invite you to join the virtual celebration here.

Nelson graduation celebration and scholarship recognition event. Photo credit: Anica Graney

Nominate a Nelson alum today!

ALUMNI AWARD WINNERS 2022
RISING STAR ALUMNI AWARD

ALUMNI AWARD WINNERS 2022
DISTINGUISHED ALUMNI AWARD

The Nelson Institute is now accepting applications for our 2022 Alumni Awards, which shine a spotlight on alumni who are making a difference in the world. We welcome nominations and self-nominations in two award categories:

The Rising Star Alumni Award is for individuals under 35 years of age OR 10 years or less from date of graduation.

The Distinguished Alumni Award is for individuals over the age of 35 OR more than 10 years from date of graduation. Please review the criteria for both categories on the Alumni Awards page.

SUBMIT A NOMINATION

SUBMIT A SELF NOMINATION

The deadline to submit a nomination is Tuesday, May 31, 2022. For more information, please visit the Alumni Awards page or contact Emily Reynolds at alumni@nelson.wisc.edu.

Awards are presented at the Nelson Institute's annual Rendezvous on the Terrace gathering for alumni and friends. The 2021 Rendezvous on the Terrace will be held Friday, September 23, 2022. Registration opens in June with more details coming soon.

RED ENVELOPE CAMPAIGN

Each semester, aligned with graduation, the Nelson Institute holds its semi-annual student fundraising campaign: The Red Envelope Campaign. One hundred percent of donations received are used to support fun, community-building experiences for Nelson students, such as ice cream socials, movie nights, Spooky Science Hall nights, study brunches, and much more! In honor of our spring 2022 graduates, please consider making a gift that will benefit future generations of Nelson students and honor the strong tradition of community-building on which the Nelson Institute prides itself. Gifts in any amount are needed and appreciated!

Foods can have very different climate impacts. Animal products are often much more carbon-intensive than plant-based foods. Photo credit: Pixabay

New research by Nelson Institute Environment and Resources alum explores food choices and climate impact

By Jill Sakai

Changing dietary patterns in the U.S. are leading to lower emissions of food-related, climate-warming gases, according to a new research study, and half of the reduction can be attributed to eating less beef. Every choice we make as consumers has a climate impact, which is often measured in terms of its "carbon footprint" — that is, the amount of greenhouse gases emitted in the process of producing a good or providing a service.

"The greenhouse gases of our food system are one of the largest portions of our footprint as a nation," says Clare Bassi, who led the new study, which was published recently in the Journal of Cleaner Production, as a master's student at the University of Wisconsin–Madison. Globally, food systems contribute about one-quarter of all human-caused greenhouse gas emissions.

It can be hard for consumers to know how specific food choices relate to overall climate impact. The carbon footprint of a food item includes emissions associated with its production, processing, transportation, cooking and waste. And different foods have very different environmental impacts — animal products and processed foods are often much more carbon-intensive than minimally processed and plant-based foods.

The new study explores the carbon footprint of Americans' eating patterns and how they have changed in recent decades.

"I wanted to see where the impacts of climate change were in our diets and how they were changing over time," says Bassi. She also examined trends based on demographic factors, such as sex, age, household income, and race/ethnicity.

Bassi analyzed eating habits reported each year from 2003 to 2018 and calculated the average daily greenhouse gas emissions associated with diet. In just 15 years, the carbon footprint of the U.S. diet fell by more than 35%, mostly due to Americans eating less meat and other carbon-intensive foods. Lower consumption of beef, dairy, chicken, pork, and eggs accounted for more than 75% of the observed diet-related carbon dioxide savings during the study period; beef alone was responsible for nearly half of the drop.

"The trend is quite exciting," Bassi says. "Over the study period, national greenhouse gas savings from dietary changes alone is roughly equivalent to offsetting emissions from every single passenger vehicle in the country for nearly two years."

As an individual, sometimes it feels like you don't have much power to make positive change, Bassi notes. But her findings show that "our collective behavior changes are making a difference," she says. By choosing foods with a smaller carbon footprint, "you can feel empowered that you can reduce your impact in a significant way."

Bassi calculated greenhouse gas emissions based on individual daily diets reported by more than 39,000 U.S. adults in the National Health and Nutrition Examination Survey between 2003 and 2018. She looked at how the averages changed over time and examined trends based on demographic factors, such as sex, age, household income, and race/ethnicity.

Every demographic subgroup she analyzed showed a 30%

to 50% reduction in diet-related greenhouse gas emissions during the study years. In general, females ate lower-impact diets than males. Females had an average food-related carbon footprint of about two kilograms of carbon dioxide emissions per person per day in 2018; for males, it was about three kilograms per person per day.

When the data were grouped by race/ethnicity, average carbon footprint was slightly higher among Hispanics compared with non-Hispanic whites and lowest among Blacks. In a breakdown by income level, diet-related carbon footprint was greatest in the highest income group (annual household income more than 1.84 times the federal poverty level, or about $46,000 for a family of four in 2018) and lowest in the lowest income group (annual income less than 1.3 times the poverty level, or $32,600 in 2018).

The lowest income group also showed the largest percentage reduction, 46.4%, between 2004 and 2018, compared with 39.3% in the highest income group. When analyzed by age group, the youngest eaters showed the largest reduction in diet-related carbon emissions, with a 15-year drop of 47.2%.

"All of that saving is essentially from people eating less greenhouse gas-intensive foods," Bassi says. Calorie intake stayed steady over the years of the survey, and the analysis used constant values for emissions related to production and other systemic factors to focus just on changes due to eating patterns.

These positive trends are encouraging, she notes, but Americans are still exceeding our fair share of food-related emissions compared to other parts of the world. A 2019 scientific report from the international EAT-Lancet Commission identified global thresholds for diet-related greenhouse gases that would adequately feed the world's population while keeping global warming below 2° C by 2050. The average U.S. diet-related carbon footprint in 2018 was still nearly twice as high as the global targets, she says.

"I wanted to see where the impacts of climate change were in our diets and how they were changing over time."

–Clare Bassi.

"The trend is quite exciting," Clare Bassi says of the reduced climate impact of the American diet. Photo courtesy of Clare Bassi

"People's actions are making a difference," Bassi says, "but we still have a long way to go."

Bassi completed the research as a master's student at the University of Wisconsin–Madison's Nelson Institute for Environmental Studies Environment and Resources program and the Wisconsin Energy Institute. The paper was co-authored with Rachael Maysels of the University of Cauca in Colombia and UW–Madison professor of biological systems engineering and Nelson Institute affiliate Rob Anex.

Learn more about Environment and Resources and how you can support the program.

2022 Rendezvous on the Terrace:
Friday, September 23, 2022
Alumni Lounge, Pyle Center,
Madison, WI
Registration opening in June

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

Left-right: Steve Boyes, Founder of Wild Bird Trust and National Geographic Explorer, Koketso Mookodi, Managing Director and Trustee for the Botswana Wild Bird Trust, Nyambe Nyambe, Executive Director of KAZA TFCA Secretariat, Nathan Schulfer, Director, International and Professional Programs, Nelson Institute for Environmental Studies. Photo credit: Diane Stojanovich

Nat Geo film screening and discussion **captivates attendees**

The Tales from Planet Earth Film Series screening and discussion of the film Into the Okavango, a National Geographic Documentary Film that follows explorers on a four-month, 1,500-mile expedition to save the river system that feeds the wetland wilderness of the Okavango Delta in Botswana, held the audience's attention from start to finish.

Special attendees for the event included Onkokame Kitso Mokaila, Botswana's Ambassador to the United States, Olerile Charles Koboto, Second Secretary at Botswana's mission to the United States, Dr. Ian Miller, Chief Science & Innovation Officer at National Geographic Society, and Mike Beckner, Director of Into the Okavango Wilderness Project at National Geographic Society.

Following the screening, Steve Boyes, the founder of Wild Bird Trust and National Geographic Explorer, Koketso Mookodi, Managing Director and Trustee for the Botswana Wild Bird Trust, and Nyambe Nyambe, the executive director of KAZA TFCA Secretariat, led a conversation about the efforts being made to protect the Okavango River Basin. The panel addressed the ecological importance of the Okavango River Basin, which provides water to about one million people and is home to the world's largest population of African elephants.

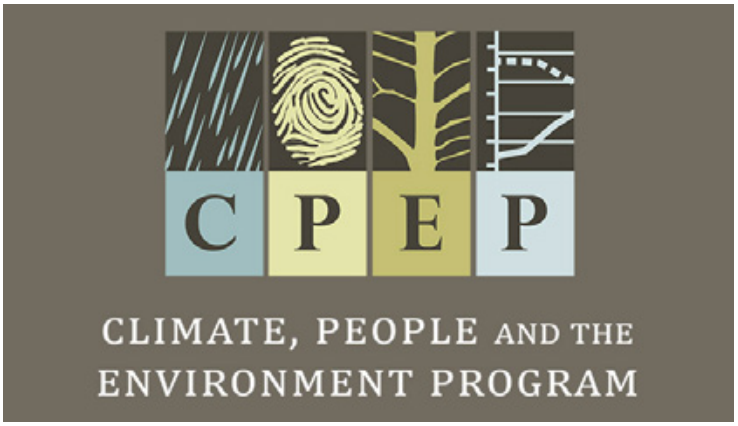
The Tales from Planet Earth Film Series originated more than a decade ago as a film festival under the direction of Gregg Mitman, Vilas Research and William Coleman Professor of History of Science, Medical History, and Environmental Studies, UW–Madison.

Historically, the film series has tried to link compelling narratives to the work of scholars and community organizations advocating for environmental and social justice.

"The Okavango Delta: Opportunities for Regional Cooperation" was among the topics at the 2022 Earth Day Learning Event. Speakers for this session, Kitso Mokaila, ambassador of the Republic of Botswana to the United States of America, Michelle Gavin, Ralph Bunche Senior Fellow for Africa Policy Studies, Council on Foreign Relations, and Nyambe Nyambe, executive director, KAZA TFCA Secretariat, explored potential for regional cooperation through shared water management goals in the Delta, and the potential of university collaborations to foster and support regional cooperation. If you missed the session, you can view the recording here.

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 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 (AOS) and are open to the public. The spring series is complete, but past lecture recordings are available for viewing.

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.

Join us

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

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